True TALES of the TROUT COD:

RIVER HISTORIES OF THE MURRAY–DARLING BASIN

Will Trueman

The Murray trout may swim about,
With unmolested cod,
And Yarra herrings from that day
Need never dread the rod. *

Published by Murray-Darling Basin Authority
Postal Address GPO Box 1801, Canberra ACT 2601
Office location Level 4, 51 Allara Street, Canberra City
Australian Capital Territory

Telephone (02) 6279 0100 International + 61 2 6279 0100
Facsimile (02) 6248 8053 International + 61 2 6248 8053
E-Mail info@mdba.gov.au
Internet http://www.mdba.gov.au

For further information contact the Murray-Darling Basin Authority office on
(02) 6279 0100

This report may be cited as: Trueman, WT (2011). True Tales of the Trout Cod: River Histories of the Murray-Darling Basin

MDBA Publication No. 215/11

ISBN: (on-line) 978-1-921914-66-9
ISBN: (print) 978-1-921914-67-6

© Copyright Murray-Darling Basin Authority (MDBA), on behalf of the Commonwealth of Australia 2011.

This work is copyright. With the exception of photographs, any logo or emblem, and any trademarks, the work may be stored, retrieved and reproduced in whole or in part, provided that it is not sold or used in any way for commercial benefit, and that the source and author of any material used is acknowledged.

Apart from any use permitted under the Copyright Act 1968 or above, no part of this work may be reproduced by any process without prior written permission from the Commonwealth. Requests and inquiries concerning reproduction and rights should be addressed to the Commonwealth Copyright Administration, Attorney General's Department, National Circuit, Barton ACT 2600 or posted at http://www.ag.gov.au/cca.

The views, opinions and conclusions expressed by the authors in this publication are not necessarily those of the MDBA or the Commonwealth. To the extent permitted by law, the MDBA and the Commonwealth excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this report (in part or in whole) and any information or material contained within it.

Australian Government Departments and Agencies are required by the Disability Discrimination Act 1992 (Cth) to ensure that information and services can be accessed by people with disabilities. If you encounter accessibility difficulties or the information you require is in a format that you cannot access, please contact us.

Front Cover: Roy & Stan Grant with a Trout cod on the banks of the upper Murray River near Burrowye c1930. Photo courtesy of Roy Grant.

Rear Cover: Thomas Bryan holds a catch of cod including a Trout cod from the Goulburn River at *Prospect Hill,* Molesworth c1927. Photo courtesy of Muriel Perry.

1 Acknowledgements

Most biographers write the story of a famous person, so it seems rather strange to have written one about a fish, let alone one whose existence was disputed for over a century. Yet it is a story worth telling, not only about the chequered history of the mythical 'Trout cod' because of the interest this animal holds in the public's imagination, but also because its story exemplifies so much of European history on the Australian continent. In writing the tale of the Trout cod, the story of the other aquatic inhabitants that share the Murray-Darling Basin with it, can also be told.

My own personal journey of discovery of native fish goes back to the early 1960s for my father, Harry Trueman, was a keen angler. I still retain the indelible memory of a giant Murray cod caught by him hanging from a tree on the banks of the Goulburn River near Seymour. A little while later he was killed in an industrial accident and it was left to my uncle Bill Trueman during camping trips into the mountains of Victoria to recount the family stories of the past when the rivers held giant Murray cod, when Macquarie perch in vast numbers at times turned the rivers black and when was caught the fabled Trout cod. By that time the same rivers held only trout, which I learnt to angle initially with bait, then progressing to lures and ultimately fly fishing. So I can profess to being brought up as a trout angler and my experience would be common to most individuals in my baby boomer generation. My experience differs, however, from most people through fate when Tom Kelly, a close friend of my father, took me on a trip to the Strathbogie Ranges where I had my first encounter with the Seven Creeks. I caught Macquarie perch and Trout cod from the creek and was genuinely shocked by their angling qualities and wanted to learn more. I was befriended by a local senior angler Barney Kipping who taught me much of the district's history. In July 1983 by sheer accident I met the late Bert McKenzie of Ruffy, born in 1908, with an encyclopaedic knowledge of the history of the fish in the Goulburn River catchment. The following weekend my friend Col Luker and I returned with a tape recorder to record Bert's memories which have been published subsequently on several occasions in angling magazines.

The genesis of this project originated in 2006 when, having read a number of scientific publications questioning angler reports of Trout cod from various waters in past years, I decided to conduct an investigation to find evidence validating Bert McKenzie's stories with a view of preparing a brief scientific paper. A turning point was when I acquired a copy of retired fishing inspector Jack Rhodes' biography containing past references to Trout cod. After contacting Jack, who lamented the loss of nearly all of his historical research notes, he urged me to expand the work to cover north east Victoria and develop a detailed history of native fish in the region. Having moved to Cairns in far north Queensland over a decade earlier meant that I had to conduct much of the research by phone interspersed by trips south during my holidays, travelling from town to town locating old anglers and their photographs. I called in at the John Lake Centre at Narrandera and was urged by Dr. Dean Gilligan to expand the project to cover the rivers of southern NSW. Finally at the end of 2007 Mark Lintermans and Jim Barrett at the Murray-Darling Basin Commission offered to publish the final work. It has grown beyond anything that I initially conceived.

I have many people to thank for bringing this work to fruition, for providing in their professional capacities generous assistance, in some instances working outside of their normal hours, to locate material. Mark McGrouther and his staff at the Australian Museum provided access to museum specimens of Trout cod and their records as well as photographing specimens. John Kean and the staff at Museum Victoria made me aware of the magnificent pieces of artwork depicting native fish in the museum's collection, as well as providing copies of early photographs. Professor Guy Duhamel and Romain Causse of the Museum National D'Histoire Naturelle in Paris were generous in providing photographs of their museum specimens as well as some background material. Dr. Jeff Williams and Shirleen Smith at the National Museum of Natural History in the

United States examined cod specimens in their collection on my behalf to identify which species they were. Ralph Foster at the South Australian Museum provided background information on the fish specimens in their collection. Dr. Daniel Pauly and Grace Ong from Fishbase also helped out with some historical material. Dr. Hannelore Landsberg at the Historische Arbeitstelle Museum fur Naturkunde in Berlin provide information on the work of Wilhelm Blandowski. Professor Tim Berra at Ohio State University who, along with Professor Allan Weatherly, ultimately identified the Trout cod as a distinct species generously provided copies of his magnificent colour photographs of the large fish he had handled plus offered his opinion on the identity of some fish in old images that I sent to him.

Jan McDonald at the State Library of Victoria managed to locate on my behalf some obscure historical works based on the limited information that I provided and in some cases translated some passages from French. Other staff members such as Gerard Hayes assisted in locating old material including photos. Kathy Bown at the Cronulla Fisheries Centre worked tirelessly on my behalf locating material held in the library and photocopying it, and was an invaluable source for old material originating in NSW. Her counterpart in Victoria, Carol Harris at the Arthur Rhylah Institute Library, also assisted. Chris Read and Joanne Cook at the State Library of South Australia assisted greatly at times with my requests, as did staff at the National Library of Australia. Graham Leith, Kevin Leamon and Bridget Reilly from at the State Library of NSW assisted in locating the original manuscripts written by the early explorers as well as photographs. Tracy Dall at the Art Gallery of South Australia generously provided access to the collection of magnificent photographs taken by Cole and Burnell of the Murray River in 1862, and staff at the University of Melbourne Archives also assisted with photographs. Professor Brian Finlayson at the University of Melbourne generously gave permission for me to reproduce the text of a letter written by Bert McKenzie shortly before his death. Amy Hankinson from the Inland Rivers Network assisted with some contacts, as well as providing a copy of an important report. Dr. Paul Frazier of the University of New England provided copies of his work on flows in the Murrumbidgee River while Dr. Andrew Boulton also provided key papers as well as encouraging me with the project. Professor Ian Clark and Professor Barry Blake provided copies of papers they published on aboriginal languages and advice on their interpretation. At the Murray-Darling Basin Commission, now the Murray-Darling Basin Authority, Matt Barwick oversaw much of the logistics of bringing the report to fruition as did Jim Barrett, Dr. Janet Pritchard, Heleena Bamford and Dr. Peter Jackson while Tim O'Donnell patiently constructed the distribution maps on my behalf. In particular I am grateful to Janet, Peter and Heleena who proof read early drafts and provided a new direction for the document.

A large number of people in a private capacity volunteered their time to assist with this project. Nick Thorne, the national secretary of Native Fish Australia, has encouraged me throughout in preparing this history as well as proof reading sections of the document. Similarly native fish ecologist Simon Kaminskas assisted with some unpublished information and also arranged for his father to translate some French publications into English, while work colleague Jennifer Pambou also assisted with the French translations. Angling writer Rod Harrison, who I have known for over 30 years, volunteered some of his memories and valuable photos as well as encouraging me to take on the project. Associate Professor Mark Lintermans of the Australian National University provided some input and critical leads on the section on the Murrumbidgee River as well as facilitating the publication of the report in the first instance. Mark's name is regularly cited in this document for he has undertaken a great deal of not only pure scientific research into the biology of native fish but also practical remedies for the many problems challenges we face in restoring populations. Similarly Dr. Stuart Rowland, Dr. Dean Gilligan, Dr. Lee Baumgartner, Jarod Lyon and Fern Hames have also provided me with encouragement and have made major contributions to restoring native fish populations.

I would like to express my appreciation to everyone involved with the Australian River Restoration Centre namely Dr. Siwan Lovett, Dr. Phil Price, Nerida Hart and Vikki Bell who not only turned my working draft into a

final quality document but created pamphlets and a website to disseminate the information to the widest possible audience. Another part of the team was Richard Snashall from Spinning Reel Audio Visual who created the website clips to provide another facet to the presentation. The final result is a testimony to their dedication and professionalism.

Within each river catchment many people assisted in locating either historical information on native fish and rivers or provided information on the local residents likely to be in possession of it. In some instances general social networking and casual conversations (sometimes pub talk!) produced excellent leads, an example being where a chat with some taxi drivers in a back street of Wangaratta resulted in the valuable nursing home interview with Bert Carmody. A number of regional historical societies generously provided valuable or rare historical records or photos and local angling clubs were a key point of contact for locating senior anglers in their area. I am sure that there will be people that I have missed in the following lists which contributed and to them I unreservedly apologize. To my family and friends who have seen little of me over the past few years as I have endeavoured to complete this work I also apologize.

In the Macquarie catchment Chris Morgan at the Bathurst Historical Society, Andrea Sauerbier and Edna Strike of the Mudgee Historical Society, Bev Holland and Sue Milne of the Orange and District Historical Society, Ken Smith, Karl Shaerf and Mark Rich were important primary contacts. People that provided information or interviews include Jim Buchan, Rick Burns, Pat Ryan, Herb Thompson, Albert Mobbs, Edna Strike, Eugene 'Goog' Sharp, Sue Milne, Rod Tonkin, Bev Holland, John Uren, Kevin Loughton, Brendan Cole, Peter Hanrahan, Doug Robbins, Sandra Smith, Peter Byrom, David Stock, Billy Sawell, Jeff Haskins, John Hadley, Carole Gass, Tom Cussack, Ian Parks, Graeme Williams, Shirley Burrows, Bruce Lee, Clive Brabham, Ian Parks, Frank Astell, Ken Jones, Norma Meadley, Noel Habberman, Henry Pearce, Brian Hodge, Ray Auld, and Ken Maher.

In the Lachlan catchment Arthur 'Tibby' Flint, Veeny Stacey, Wayne Burns, Richard Kennedy from the Crookwell and District Historical Society, Joe Lewis, Mary Chalker of the Taralga Historical Society, Audrey Farley from the Canowindra Historical Society, Peter MacAllister, Noel Newman, Grove Craven, Neil Cambell, Les Croaker, Madeleine Forgie from the Gooloogong Historical Society, Eric 'Sugar' Beer, Jack Meany, Wayne Cummins, Dick Elvins and Mona Motum all contributed to the writing of the history of their area.

In the Murrumbidgee catchment John Winterbottom of the Wagga Wagga Historical Society, Jillian, Madison, and Lauren Cottle at the Charles Sturt University Archives, Harry Hill, Marge Longford, Heather Rhodes from the Cooma-Monaro Historical Society, Gordon Hain, the late Gordon Winter, David Ryrie, Rod Cockburn, Paul O'Malley, Cheryl Mongan and Gloria Carloss at the Yass Historical Society, Mack Hardie, Harry Laney, Lance Hawker, Jim Bailey, Lee Payne, Dr. Bryan Pratt, Terry Rutzou, Allan Foskett, Norman Moore, Noel Denson, Ron Bowden, Caroline Merylles from the Hay Historical Society, June Hulands, Denzil Ballard, Bob Brook, Associate Professor Mark Lintermans and 'Tiny' Egan helped me put together an adequate history on what is a huge area. Of all the rivers the Murrumbidgee is the one that I am least satisfied with the final history as I believe that far more information is yet to be discovered. It is only through the generous assistance of these people that the final text on this river is respectable.

In the upper Murray and Kiewa Catchments Claude Handorf, Val Swasbrick, Peter Tidd, Vic Pay, Jack Rhodes, Bill Murphy, Snow Hadley, Roy Grant and his nephews Bill and Jim Willis, Julie-May Stewart, Albert Mildren, Ken Nankervis, Tom Jarvis, Jim McGinnity, Betty Walton, Len and Betty Lebner, John Whitehead, Dianne Humphrey, Neville Hadley and Bill Murphy all generously provided information. A special mention has to go to Roy Grant for not only sharing his memories but also providing his collection of magnificent photographs.

In the Riverina and Central Murray catchments Bill Mulham from the Deniliquin Historical Society and Helen Rendle and of the Echuca and District Historical Society were stalwarts who supported me throughout the project. In particular Heather had a vast array of historical material which she made available including previously unknown records on river de-snagging. Many others helped in various ways over this vast tract of country including Helen Coulson, Chris Beale, Henry Davies, Ramon Clifford, Max Clifford, the late Wallace 'Laddy' Clifford, Norm Wilson, Yvonne Church of the Cohuna Historical Centre, Tracy Searle, Evelyn at the Barham-Koondrook Historical Society, Ken Grose of the Euston-Robinvale Historical Society, Jacye Symes from the Yarrawonga Historical Society, Charlie Aitchison, Greg and Wendy McKenzie, Heath McKenzie, Greg Norris, Betty Jenvey, Julie Whateley of the Swan Hill Historical Society, Bill Lever, Ian McDonald, Don Briggs, Robert Wallace, Steve and Ken Trefall, Kevin McKinnon, Jock Nicholson, Graham Vidler, Jo Donelan of the Railway Hotel at Strathmerton, Tim Cole, Peter Web, Hugh Dick, Ron Reynolds, Grant Mitchell, Bert Roberts, Cyril and Michael Walden and Betty McGilvray. While I did not source any oral history in the lower Murray Michael Hammer and Shane Strudwick helped out in key areas including photographs.

In the Mitta Mitta catchment Beverly Stewart, Malcolm Ronan, Jack Moyle, Alec Turnball, Coral Kracke and Jeff Cooper from the Omeo Historical Society, Vince Pendergast, Graeme Pendergast, Redge and Judy Pendergast, John Yea, Tom Yea, Bill Hollands, Sonny Betts, Stan Walsh, Jean Merbach from the Tallangatta Historical Society, Collin Scales, George and Glenda Murtagh, David Evans, Les Franks, Lloyd Butler, Brett Lee, Cliff Brummel, Margaret Pendergast and Max Dyer all assisted. It is through these people that we now have a good picture of what was the highest altitude population of larger native fish in Victoria.

In the Ovens and Broken catchments Greg Dunkley, Don Burrowes, Steve Leckell, Peter Villiers, Des Mansfield, Bert Carmody, Max Suffield, John Taylor, Jennifer Williams at the Burke Museum at Beechworth, Phil Hines at the Ovens and Murray Advertiser, Val Gleeson, Tom Knox, Bill Dart, Adam Bosley, Iris Mannik, Joe Krauss, John Rutten, Lance Jarvis, Allan and Geoff Holt, Daisy Lewis, Lance White, Pat Griffin, Ian Halden, Wally Mitchell, the late Bill Ellis, Gladys Ellis, Bing Kneebone, Peter Villiers, Pat Griffin, Glenda Hall, Kathleen Woodward, Jim Masters, Walter Grattidge, Greg Daws, Sue McIntosh, Len Maples, Redge O'Connor, George and Fred Jones, Robin Sadler and Ken Whan from the Benalla Historical Society, Neil McQualter, Ambrose Doxey all assisted in writing the history of their areas

In the Goulburn catchment Collin Luker, the late Bert McKenzie, the late Barney Kipping, Peter Kerr, Don Polkinghorne, Warwick Finlay from the Murchison Historical Society, Glen Jones, Muriel Perry, Loretta McPherson from the Euroa Historical Society, Sheena Daykin from the Mansfield Historical Society, Margaret Spinks, Keith Jones, Jim Hanley, Collin Bell, Ron Bell, Wal Cubbin, Graham McLeod, Santo Rimato, Bill Morris, Lindsay McIntosh, Digger Garlick, Ray Hopkins, Yvonne Chalicki from the Jamieson Historical Society, Max Mathews, Nancy Halligan, John Royals, Frank Moore, Russell Stillman, Bruce Findlay, Ron Bain, Wes Jeffries, Robert McLeod, Bruce Nicholson, Robert Hayes, Joyce White, Yvonne Finch, John Pilkington, Darnly Montgomery and, Ron Reynolds all contributed in putting together the chapter of this work which was focus of the project when first conceived. I have to make special mention of Muriel Perry who after a phone conversation posted to me copies of photos of catches of cod that she possessed from the location where Bert McKenzie used to fish. I can still recall my hands shaking after opening the envelope and inspecting the contents. At that instant I knew that Bert had been correct all along.

In the Campaspe and Loddon catchments Ken Major, Tom Reid, Lyn Allen, Ken Read, Una Taig, John Colvin, Bill Moody, Bill Strong, Elizabeth Murfitt from the Heathcote Historical Society, Tania at the McIvor Times, Larina Strauch and Noel Davis at the Kyneton Historical Society, Ron Mudford, Margaret Harley at the Rochester Historical Society, Ken Wilson, Graham Waite, George East, Frank Buckley, Barry Crombie, Jim Tudgeon, Robert Scholes, Frank Passalaqua, Leann Streader and Graeme Weake from the Boort Historical Society,

Harold Chalmers, Bill Rumbolt, Olly Jane from the Kerang Historical Society, Mick Ashton, Betty Duncan at the Clunes Historical Society, Ron Dalmenico and Arlene McDonald all helped out in what proved to be a fairly difficult region to locate material on the early fish fauna.

While I have met a lot of these people in person, there are many I have (to date) only spoken to over the phone. I am humbled that so many have been so gracious in helping me out, a total stranger, by entrusting me with their past. Some I now call friends and I have received a number of offers to visit or stay with some of the people I have acknowledged, which I will take up when I can in the future. To Jack Rhodes I hope that I have at least in part done justice to the faith you placed in me when you encouraged me to take on this endeavour. A number of people, such as Max Mathews, Russell Stillman and Walter Grattidge, have now passed away but these individuals, along with everyone else, generously shared their thoughts so that later generations would know something of a world which they will never experience. I know that recording the memories of the past became very important to many of the people that I interviewed. Thank You.

Will Trueman
May 2011

2 Fishes of the Murray-Darling Basin Discussed in this Publication

The following table summarises common, scientific and some aboriginal names of native fish in the Murray-Darling Basin from the Macquarie River Catchment south. The names of native fish attributed to aboriginal people in the writings of Europeans, mostly from primary historical sources, are included. Provided in parenthesis is the likely language group from which each aboriginal name was sourced either from the accounts or from modern published language maps. Aboriginal names are provided as a historical record and contemporary dictionaries of aboriginal language should be consulted for names currently accepted by aboriginal people.

N = Native T = Translocated A = Alien

Official Common Name (from Lintermans, 2007)	**Scientific Name**	**Other Common Names**	**Aboriginal Names Identified in Historical Accounts**	**Origin**
Trout cod	*Maccullochella macquariensis*	Murray trout, Murrumbidgee trout, Rock cod, Bluenose	*Yaturr* (Jari Jari) *Ngumel* (Wemba Wemba) *Bangami* (Yorta Yorta) probably *Inme* or *Inna* (Yaithmathang) possibly *Yambuwa* (Dhudhuroa)	N
Murray cod	*Maccullochella peelii*	Cod, Codfish, Goodoo	*Ponkoo* (Morunde) *Ponde* (Ngarrindjeri) *Barnta* (Jari Jari) *Googoobul* (Wiradjuri) *Kurrumerruck* (Wemba Wemba) *Pandyil* (Wemba Wemba) *Burnanga* (Yorta Yorta) probably *Mewuruk* (Ngunawal)	N
Macquarie perch	*Macquaria australasica*	Mountain perch, White Eye, Black bream, Butterfish, Snubnose perch, Goggle eyes	probably *Wanambiyu* (Dhudhuroa) possibly *Nooraderri* or *Gubir* (Wiradjuri)	N
Golden perch	*Macquaria ambigua ambigua*	Yellowbelly, Callop, Murray perch, Cockerling, Cockerill	*Colubco* (Morunde) *Tarkee* (Ngarrindjeri) *Birnett* (Wemba Wemba) *Pollungunder* (Baraba Baraba) *Kaakaalain* or *Kookalin* (Wiradjuri) probably *Kupe* (Ngunawal) probably *Kongoopna* (Ngurai-illam wurrung) possibly *Murruwanba* (Dhudhuroa)	N
Estuary perch	*Macquaria colonorum*	Estuarine perch	*Taralga* (Ngarrindjeri)	N
Silver perch	*Bidyanus bidyanus*	Grunter, Silver bream, Black bream, Bidyan	*Toorroo* (Morunde) *Teheeree* (Ngarrindjeri) *Kooberry* (Wiradjuri) *Bagguck, Karpa, Buruitjall, Bipe* (all Jari Jari)	N
Spangled perch	*Leipotherapon unicolor*	Bobby cod, Spangled grunter, Jewel perch		N
Southern pygmy perch	*Nannoperca australis*		*Collundera* (Jari Jari)	N
Freshwater catfish	*Tandanus tandanus*	Jewfish, Eeltail catfish, Tandan, Eelfish, Murray ling	*Pomery* (Ngarrindjeri) *Pulyee* (Morunde) *Kenaru* (Jari Jari) *Dundong* (Wiradjuri) *Wanyakayi* (Wemba Wemba) *Pirra-wil* (Wemba Wemba)	N
'Blackfish' = River blackfish	*Gadopsis marmoratus*	Slippery, Slimy, Greasy,	*Paltk* (Jari Jari) *Mekunang* (Djadjawurrung) *Wuggar* (Ngunawal)	N

Official Common Name (from Lintermans, 2007)	Scientific Name	Other Common Names	Aboriginal Names Identified in Historical Accounts	Origin
Two-spined blackfish	*Gadopsis bispinosus*	Muddy, Marbled river cod, Tailor, Gudgeon, Nikkie, Grayling, Blueguts		
Southern purple-spotted gudgeon	*Mogurnda adspersa*	Purple spotted gudgeon	*Kurin* (Jari Jari)	N
Flat-headed gudgeon	*Philypnodon grandiceps*	Flathead Gudgeon, Big-headed Gudgeon, Bullhead gudgeon		N
Bony herring	*Nematolosa erebi*	Bony Bream, Hairback herring, Pyberry, Melon fish	*Manur* (Jari Jari) *Pyberry* (Ngarrindjeri)	N
Congolli	*Pseudaphritis urvilli*	Tupong, Sandy		N
Olive Perchlet	*Ambassis agassizii*	Glass Perchlet	*Mullapit* (Jari Jari)	N
Murray-Darling rainbowfish	*Melanotaenia fluviatilis*	Crimson-spotted rainbowfish	*Jerrin* (Jari Jari)	N
Australian smelt	*Retropinna semoni*		*Turritje* (Jari Jari)	N
'Eels' = Short-finned eel Long-finned eel	 *Anguilla australis* *Anguilla reinhardtii*	 Silver eel Spotted eel		N/T
'Lampreys' = Short-headed lamprey Pouched lamprey	 *Mordacia mordax* *Geotria australis*	Lamper eels		N
Brown trout	*Salmo trutta*			A
Rainbow trout	*Oncorhynchus mykiss*			A
Redfin perch	*Perca fluviatilis*	Redfin, English perch, European perch		A
European carp	*Cyprinus carpio*	Common carp, Koi carp, Carp		A
Goldfish	*Carassius auratus*	Common carp, Crucian carp, Native carp, Old carp		A
Tench	*Tinca tinca*	Doctor fish		A
Roach	*Rutilus rutilus*			A
Eastern gambusia	*Gambusia holbrooki*	Gambusia, Mosquitofish, Top minnow, Plague minnow		A
Oriental weatherloach	*Misgurnus anguillicaudatus*	Japanese weatherloach, Weatherfish		A

3 Imperial Units

This publication includes a large amount of historical material written at a time when the British Imperial System of weights and measures was in use in Australia. The following information identifies imperial units used and their metric equivalents:

1 ounce (oz.) = 0.028 kg

1 pound (lb. or lbs.) = 0.453 kg

1 hundred weight (cwt) = 453 kg

1 ton = 1.016 tonne

1 inch = 25.4 mm

1 foot = 0.305 m

1 mile = 1.609 km

1 pound (£) = approximately 2 Australian dollars ($)

4 Introduction: People should know how it once was

In response to the serious decline of native fish populations, the Murray-Darling Basin Commission (now the Murray-Darling Basin Authority) prepared and released its *Native Fish Strategy 2003-2013* (MDBC, 2004). The document broadly outlined the changes that had occurred in native fish populations, estimating remaining communities to be about 10 per cent of that which existed prior to European settlement. The plan set as a goal the recovery of native fish communities in the basin to 60% of that prior to European settlement within 50 years.

Fundamental to realising this goal is knowledge as to the original distribution and abundance of the fish fauna of the basin. Such information is necessary to identify the magnitude of the target to be achieved within the fifty year time frame. An understanding of the changes to fish populations over time also aids in the identification of the causative agents of fish population decline, and the implementation of strategies to mitigate their effects to initiate the recovery process. Comparisons between the past and present occurrence and abundance of native fish species in specific waterways is being utilized as a direct measure of the health of the aquatic environment and will be used to indicate the success of the *Native Fish Strategy* (Davies *et al.,* 2008). The validity of such an approach is fundamentally dependent upon an accurate knowledge of the original distribution and abundance of native fish populations in the waterways being assessed.

There has been limited readily available information on the rivers and their fish populations at the time of European settlement. The journals of notable European explorers and settlers contain references to rivers and in some cases their fish. Recently some of these accounts have been compiled into an electronic resource by the Murray-Darling Basin Authority (Scott, 2005). It was not until the twentieth century that broad scale ecological study of the fish and rivers of the Murray-Darling Basin commenced. The best known is the survey conducted by Colonel John Langtry for the then Victorian Fisheries and Game Department between 1949 and 1952 (Cadwallader, 1977). While valuable, the work was limited to lowland habitats, and occurred after significant perturbations to fish populations had taken place - a fact recognized by Langtry himself. Nonetheless it remains the most widely utilized historical account of native fish populations in the basin.

Many references to the rivers, and their fish, reside in the personal journals and manuscripts of early pioneers, graziers and miners. Government agencies hold in their archives old manuscripts and reports which are valuable sources of information, and are far less well known than Langtry's survey, in some cases predating it by over half a century. Newspapers contain many stories of the rivers and their fish in the early days, but to date few have been identified. Recently the *National Library of* Australia commenced a project to scan and store electronically national, state and regional newspapers which can be researched using a search engine. While the project will take years to complete it is already providing the capacity to locate accounts of fish in a large number of publications and issues. Collectively, many of these information sources remain obscure , with the accounts they contain largely unknown to scientists, fisheries managers and historians. As a consequence of the lack of readily available historical information, our understanding of the original distribution, abundance and biology of native fish in the Murray-Darling Basin is largely inferred from contemporary scientific studies of an environment that has undergone drastic change.

The only species for which attempts have been made to prepare a comprehensive history is the iconic Murray cod, *Maccullochella peelii* (Mitchell) (Percichthyidae), prepared by Dr. Stuart Rowland initially as a thesis (Rowland, 1985) and subsequently in general publication (Rowland, 1989; Rowland, 2005). The importance of the Murray cod to the community was such that the MDBA held a dedicated workshop reviewing all knowledge and issues relevant to the species (Lintermans & Phillips, 2005). These works reviewed the biology

of Murray cod in general, documented the historic decline of populations over the basin, and identified the possible factors responsible. The other Murray-Darling fish species have not been the subject of such a concerted effort to document their history. A number of authors (Cadwallader, 1981; Cadwallader & Gooley, 1984; Grumley, 1986) have published papers on the historical distribution of individual species, but these have been limited to reporting the occurrence of them within various waters without describing total or relative abundance. Recently the MDBA has initiated a number of projects to collect and collate historical information on the original distribution of native fish.

Trout cod, *Maccullochella macquariensis* (Cuvier) (Percichthyidae), are one of the more enigmatic species of the Murray-Darling Basin. Although first described in 1829 and widely recognized by many scientists and anglers, its status as a species distinct to the Murray cod was not generally accepted by the scientific community until 1972 (Berra & Weatherly, 1972). By that time it was critically endangered, and is now considered a flagship species for the Native Fish Strategy. As a consequence of the limited records available, there has been uncertainty as to the original distribution, abundance and habitat preferences of the species. John Lake (1967b) provided the often cited comment that Trout cod were 'restricted to the cooler upper reaches of the Murray River and its tributaries above Yarrawonga'. Reinforcing this view was the persistence of a population of Trout cod in the Seven Creeks near Strathbogie in north east Victoria, a rocky upland stream which initially was the focus of research into the biology of the species (Cadwallader, 1979).

Recent authors have challenged Lake's contention, implying that the species may have been primarily most common in lowland habitat and less common further upstream in the Murray-Darling Basin (Douglas *et al.,* 1994; Brown *et al.,* 1998). This view not only differs from Lake's opinion but that reported in a number of historical sources. There have been credible accounts from anglers of catching Trout cod, referring to the fish as 'bluenose' or 'rock cod' including the recollections of the late R. D. (Bert) McKenzie (Trueman & Luker, 1992) and those recounted by retired Victorian Fisheries and Wildlife Inspector J. O. (Jack) Rhodes in his autobiography (Rhodes, 1999). These accounts, while reporting Trout cod as having being previously common in lowland waters, also describe the species being abundant in upland and even montane habitats.

Until comparatively recently such oral or 'anecdotal' accounts have been considered of limited benefit to scientists due to the limitations of the experience of lay observers, the quality of their observations and the development of their own personal beliefs. Roberts and Sainty (1996) with *Listening to the Lachlan* produced a landmark work in the form of an oral history of the environment of the lower Lachlan River. They provided a framework for validating the oral accounts collected from residents of that catchment, protocols, which they subsequently formalized (Roberts & Sainty, 1997). Utilising a similar approach Copeland *et al.* (2003) prepared an oral history of the fish in the Gwyder River catchment. Boulton *et al.* (2004) reviewed the work of these authors and others, giving credibility to oral history as a powerful narrative of environmental change, and highlighting the importance of multiple lines of evidence. They have termed this approach of verifying oral history as 'historical triangulation'. Utilising the process of historical triangulation the recollections of lay observers can be validated using evidence such as photographs, newspaper stories and supporting accounts to provide a reliable source of historical information (Robertson *et al.,* 2000).

An initial project was commenced by the author in 2006 to validate the accounts of Bert McKenzie on the historic occurrence of Trout cod in a number of waters by collecting supporting evidence and using the process of historical triangulation. It was subsequently expanded to include evidence for the accounts published by Rhodes (1999). This included locating old photographs, written sources and further oral accounts to verify the stories. The focus of the research was the slopes, upland and montane regions of north east Victoria where the accounts of McKenzie and Rhodes originated from. Little is currently known of the early fish fauna of these higher altitude habitats. Although there are some old historic references reporting the existence of cod and

other large native fish in the headwater areas of the Murray-Darling Basin (Evans, 1813; Wilson, 1857) very few to date have been located, and the original fish fauna of upland and montane regions has been poorly described. An interim report outlining the type of information uncovered and discussing its implications was prepared for *Native Fish Australia* (Trueman, 2007). With support from the MDBA the project has been continued and culminated in the preparation of this document. The scope of the project has grown to attempt not only to reconstruct an accurate historical distribution for Trout cod but to do so for the other larger native fish species in the rivers of the southern Murray-Darling Basin.

Ultimately, the aims of this project were to:

1. Collect, collate and analyse historical information on native fish in the southern half of the Murray-Darling Basin;
2. Identify the original distribution and habitat preferences of Trout cod and resolve the ongoing debate on this issue;
3. Identify the original distribution and habitat preferences of the other large fish species, primarily those of interest to anglers;
4. Collect general historical information on native fish, in particular aspects of their biology;
5. Document changes or events that may have contributed to the decline of native fish;
6. Present the information collected in a format to assist scientists and managers engaged in the recovery of native fish but also accessible to the general public so as to increase community awareness of the plight of Trout cod and other native fish species.

From all of the historical sources, a wealth of information from across the basin has been collected on Trout cod, with much also on the other larger fish species. The result is that it is now possible, in at least some catchments, to confidently identify the original fish fauna and provide some indication of the relative abundance of the different species. Presented here is a large volume of information, individual pieces of which are of interest to scientists, anglers, conservationists, students and historians. Many rare or obscure historical references and newspaper stories, some of which are difficult to locate, have been published in full or at least as substantial extracts to make the information readily accessible to all those that may have an interest in their content. It is hoped that whatever the reader's interest that this material provides a greater understanding of the fish and our rivers in the past.

By collating the historical descriptions of the fish and rivers of the Murray-Darling Basin, a window into a lost world is created through which we gain an insight to our history and, hopefully, some wisdom to be better prepared for the future. Sadly some of the elderly individuals who generously shared their recollections of the fish and rivers as they once were have since passed away, but their stories survive to provide a picture of the past. As long time resident of the Mitta Mitta River 90 year old George Murtagh put it 'the way things were in the past are gone. Those times won't be back. But people should know how it once was'.

Contents

1 Acknowledgements 1-1

2 Fishes of the Murray-Darling Basin Discussed in this Publication 2-1

3 Imperial Units 3-1

4 Introduction: People should know how it once was 4-1

5 A Tale of Two Cod 5-1

5.1 The Setting 5-3

5.2 Discovery 5-4

5.3 Genesis of an Argument 5-10

5.4 Renaissance Under Stead 5-20

5.5 Return to Obscurity 5-27

5.6 Resolution 5-29

6 The Key External Differences between Murray Cod & Trout Cod 6-1

6.1 Key External Features of Murray cod & Trout cod 6-3

7 Methodology: Reconstructing the Past 7-1

7.1 Describing Fish Abundance 7-1

7.2 The Habitats 7-2

7.3 Evidence Collected 7-2

7.4 Assessing the Information 7-4

8 Goulburn River Catchment 8-1

8.1 Early European Accounts 8-4

8.2 The Past Distribution of Fishes in the Goulburn River Catchment 8-6

8.2.1 The Montane Zone 8-6

8.2.2 The Upland Zone 8-7

8.2.3 The Slopes Zone 8-8

8.2.4 The Lowland Zone 8-10

8.2.5 Estimates of Native Fish Abundance in the Goulburn River Catchment at European Settlement. 8-13

8.3 The Changes 8-25

8.3.1 Changes to Native Fish Distribution and Abundance 8-25

8.3.2 Changes to Habitat 8-26

8.4 The Current Situation 8-29

8.5 Newspaper Highlights 8-30

8.6 Goulburn River Catchment Oral Histories 8-35

9 Mitta Mitta River Catchment 8-1

9.1 Early European Accounts 8-4

9.2 The Past Distribution of Fishes in the Mitta Mitta River Catchment 8-6

9.2.1 The Montane Zone 8-6

9.2.2 The Upland Zone 8-7

9.2.3 The Slopes Zone 8-8

9.2.4 Estimates of Native Fish Abundance in the Mitta Mitta Catchment at European Settlement. 8-10

9.3 The Changes 8-17
9.3.1 Changes to Native Fish Distribution and Abundance 8-17
9.3.2 Changes to Habitat 8-18
9.4 The Current Situation 8-19
9.5 Newspaper Highlights 8-20
9.6 Mitta Mitta River Catchment Oral Histories 8-22
9 Mitta Mitta River Catchment 9-1
9.1 Early European Accounts 9-4
9.2 The Past Distribution of Fishes in the Mitta Mitta River Catchment 9-6
9.2.1 The Montane Zone 9-6
9.2.2 The Upland Zone 9-7
9.2.3 The Slopes Zone 9-8
9.2.4 Estimates of Native Fish Abundance in the Mitta Mitta Catchment at European Settlement. 9-10
9.3 The Changes 9-17
9.3.1 Changes to Native Fish Distribution and Abundance 9-17
9.3.2 Changes to Habitat 9-18
9.4 The Current Situation 9-19
9.5 Newspaper Highlights 9-20
9.6 Mitta Mitta River Catchment Oral Histories 9-22
10 Upper Murray River Catchment 10-1
10.1 Early European Accounts 10-4
10.2 The Past Distribution of Fishes in the Upper Murray River Catchment 10-5
10.2.1 The Montane Zone 10-6
10.2.2 The Upland Zone 10-7
10.2.3 The Slopes Zone 10-7
10.2.4 Estimates of Native Fish Abundance in the Upper Murray River Catchment at European Settlement. 10-9
10.3 The Changes 10-20
10.3.1 Changes to Native Fish Distribution and Abundance 10-20
10.3.2 Changes to Habitat 10-20
10.4 The Current Situation 10-23
10.5 Newspaper Highlights 10-24
10.6 Significant Extracts from the Annual Reports on the Fisheries of NSW 10-24
10.7 Upper Murray River Catchment Oral Histories 10-26
11 Kiewa River Catchment 11-1
11.1 Early European Accounts 11-4
11.2 The Past Distribution of Fishes in the Kiewa River Catchment 11-4
11.2.1 The Montane & Upland Zones 11-4
11.2.2 The Slopes Zone 11-5
11.2.3 Estimates of Native Fish Abundance in the Kiewa River Catchment at European Settlement. 11-6
11.3 The Changes 11-9
11.3.1 Changes to Native Fish Distribution and Abundance 11-9

11.3.2 Changes to Habitat 11-9
11.4 The Current Situation 11-9
11.5 Newspaper Highlights 11-11
11.6 Kiewa River Catchment Oral Histories 11-12
12 Ovens River Catchment 12-1
12.1 Early European Accounts 12-4
12.2 The Past Distribution of Fishes in the Ovens River Catchment 12-5
12.2.1 The Montane Zone 12-6
12.2.2 The Upland Zone 12-6
12.2.3 The Slopes Zone 12-7
12.2.4 The Lowland Zone 12-8
12.2.5 Estimates of Native Fish Abundance in the Ovens River Catchment at European Settlement. 12-10
12.3 The Changes 12-18
12.3.1 Changes to Native Fish Distribution and Abundance 12-18
12.3.2 Changes to Habitat 12-18
12.4 The Current Situation 12-21
12.5 Newspaper Highlights 12-22
12.6 Ovens River Catchment Oral Histories 12-24
13 Broken River Catchment 13-1
13.1 Early European Accounts 13-4
13.2 The Past Distribution of Fishes in the Broken River Catchment 13-4
13.2.1 The Montane Zone 13-5
13.2.2 The Upland Zone 13-5
13.2.3 The Slopes Zone 13-5
13.2.4 The Lowland Zone 13-6
13.2.5 Estimates of Native Fish Abundance in the Broken River Catchment at European Settlement 13-8
13.3 The Changes 13-12
13.3.1 Changes to Native Fish Distribution and Abundance 13-12
13.3.2 Changes to Habitat 13-13
13.4 The Current Situation 13-14
13.5 Newspaper Highlights 13-15
13.6 Broken River Catchment Oral Histories 13-16
14 Campaspe River Catchment 14-1
14.1 Early European Accounts 14-4
14.2 The Past Distribution of Fishes in the Campaspe River Catchment 14-6
14.2.1 The Montane Zone 14-6
14.2.2 The Upland Zone 14-6
14.2.3 The Slopes Zone 14-6
14.2.4 The Lowland Zone 14-8
14.2.5 Estimates of Native Fish Abundance in the Campaspe River Catchment at European Settlement. 14-9
14.3 The Changes 14-12

14.3.1 Changes to Native Fish Distribution and Abundance 14-12
14.3.2 Changes to Habitat 14-12
14.4 The Current Situation 14-14
14.5 Newspaper Highlights 14-15
14.6 Campaspe River Catchment Oral Histories 14-18
15 Central Murray River Catchment 15-1
15.1 Early European Accounts 15-4
15.2 The Past Distribution of Fishes in the Central Murray River Catchment 15-11
15.2.1 Upper Lowland Zone 15-11
15.2.2 Middle Lowland Zone 15-13
15.2.3 Lower Lowland Zone 15-16
15.2.4 Estimates of Native Fish Abundance in the Central Murray River Catchment at European Settlement 15-18
15.3 The Changes 15-31
15.3.1 Changes to Native Fish Distribution and Abundance 15-31
15.3.2 Upper Lowland Zone 15-31
15.3.3 Middle Lowland Zone, Yarrawonga to Echuca 15-31
15.3.4 Middle Lowland Zone, Echuca to Wakool Junction 15-32
15.3.5 Lower Lowland Zone 15-33
15.3.6 Changes to Habitat 15-33
15.4 The Current Situation 15-38
15.5 Newspaper Highlights 15-39
15.6 Significant Extracts from the Annual Reports on the Fisheries of NSW 15-42
15.7 Central Murray River Catchment Oral Histories 15-44
16 Loddon River Catchment 16-1
16.1 Early European Accounts 16-4
16.2 The Past Distribution of Fishes in the Loddon River Catchment 16-5
16.2.1 The Montane Zone 16-6
16.2.2 The Upland Zone 16-6
16.2.3 The Slopes Zone 16-6
16.2.4 The Lowland Zone 16-8
16.2.5 Estimates of Native Fish Abundance in the Loddon River Catchment at European Settlement. 16-10
16.3 The Changes 16-14
16.3.1 Changes to Native Fish Distribution and Abundance 16-14
16.3.2 Changes to Habitat 16-15
16.4 The Current Situation 16-18
16.5 Newspaper Highlights 16-19
16.6 Loddon River Catchment Oral Histories 16-22
17 Macquarie River Catchment 17-1
17.1 Early European Accounts 17-4
17.2 The Past Distribution of Fishes in the Macquarie River Catchment 17-7
17.2.1 The Montane Zone 17-8

17.2.2 The Upland Zone 17-9
17.2.3 The Slopes Zone 17-9
17.2.4 The Lowland Zone 17-10
17.2.5 Estimates of Native Fish Abundance in the Macquarie River Catchment at European Settlement. 17-11
17.3 The Changes 17-15
17.3.1 Changes to Native Fish Distribution and Abundance 17-15
17.3.2 Changes to Habitat 17-15
17.4 The Current Situation 17-16
17.5 Newspaper Highlights 17-17
17.6 Significant Extracts from the Annual Reports on the Fisheries of NSW 17-19
17.7 Macquarie River Catchment Oral Histories 17-21
18 Lachlan River Catchment 18-1
18.1 Early European Accounts 18-4
18.2 The Past Distribution of Fishes in the Lachlan River Catchment 18-5
18.2.1 The Montane Zone 18-6
18.2.2 The Upland Zone 18-6
18.2.3 The Slopes Zone 18-7
18.2.4 The Lowland Zone 18-7
18.2.5 Estimates of Native Fish Abundance in the Lachlan River Catchment at European Settlement. 18-9
18.3 The Changes 18-13
18.3.1 Changes to Native Fish Distribution and Abundance 18-13
18.3.2 Changes to Habitat 18-13
18.4 The Current Situation 18-14
18.5 Newspaper Highlights 18-15
18.6 Significant Extracts from the Annual Reports on the Fisheries of NSW 18-16
18.7 Lachlan River Catchment Oral Histories 18-18
19 Murrumbidgee River Catchment 19-1
19.1 Early European Accounts 19-5
19.2 The Past Distribution of Fishes in the Murrumbidgee River Catchment 19-9
19.2.1 The Montane Zone 19-9
19.2.2 The Upland Zone 19-10
19.2.3 The Slopes Zone 19-12
19.2.4 The Lowland Zone 19-12
19.2.5 Estimates of Native Fish Abundance in the Murrumbidgee Catchment at European Settlement. 19-14
19.3 The Changes 19-23
19.3.1 Changes to Native Fish Distribution and Abundance 19-23
19.3.2 Changes to Habitat 19-24
19.4 The Current Situation 19-25
19.5 Newspaper Highlights 19-27
19.6 Significant Extracts from the Annual Reports on the Fisheries of NSW 19-31

19.7 Murrumbidgee River Catchment Oral Histories 19-37

20 Riverina Catchment 20-1

20.1 Early European Accounts 20-4

20.2 The Past Distribution of Fishes in the Riverina Catchment 20-5

20.2.1 The Slopes Zone 20-5

20.2.2 The Lowland Zone, East & West 20-6

20.2.3 Estimates of Native Fish Abundance in the Riverina Catchment at European Settlement. 20-8

20.3 The Changes 20-14

20.3.1 Changes to Native Fish Distribution and Abundance 20-14

20.3.2 Changes to Habitat 20-14

20.4 The Current Situation 20-17

20.5 Newspaper Highlights 20-18

20.6 Annual Reports on the Fisheries of NSW 20-21

20.7 Riverina Catchment Oral Histories 20-24

21 Lower Murray River Catchment 21-1

21.1 Early European Accounts 21-4

21.2 The Past Distribution of Fishes in the Lower Murray River Catchment 21-6

21.2.1 Estimates of Native Fish Abundance in the Lower Murray River Catchment at European Settlement. 21-10

21.3 The Changes 21-18

21.3.1 Changes to Native Fish Distribution and Abundance 21-18

21.3.2 Changes to Habitat 21-18

21.4 The Current Situation 21-21

21.5 Newspaper Highlights 21-22

22 Wimmera & Avoca River Catchments 22-1

22.1 Wimmera River 22-1

22.2 Avoca River 22-2

23 Analysis and Summary of Historical Information on Native Fish 23-1

23.1 Trout Cod, *Maccullochella macquariensis* 23-3

23.1.1 European Discovery 23-5

23.1.2 Aboriginal Names 23-5

23.1.3 European Names 23-6

23.1.4 Distribution and Habitat 23-7

23.1.5 Translocations 23-10

23.1.6 Size 23-11

23.1.7 Historical Life History Observations 23-12

23.1.8 Community Value 23-13

23.1.9 Decline & Current Status 23-15

23.2 Murray cod, *Maccullochella peelii* 23-22

23.2.1 European Discovery 23-24

23.2.2 Aboriginal Names 23-24

23.2.3 European Names 23-25

23.2.4 Distribution and Habitat 23-25
23.2.5 Translocations 23-26
23.2.6 Size 23-27
23.2.7 Community Value 23-28
23.2.8 Decline & Current Status 23-29
23.3 Golden Perch, *Macquaria ambigua* 23-31
23.3.1 European Discovery 23-33
23.3.2 Aboriginal Names 23-33
23.3.3 European Names 23-34
23.3.4 Distribution and Habitat 23-34
23.3.5 Translocations 23-36
23.3.6 Size 23-36
23.3.7 Community Use 23-36
23.3.8 Decline & Current Status 23-37
23.4 Silver Perch, *Bidyanus bidyanus* 23-39
23.4.1 European Discovery 23-41
23.4.2 Aboriginal Names 23-41
23.4.3 European Names 23-42
23.4.4 Distribution and Habitat 23-42
23.4.5 Translocations 23-43
23.4.6 Size 23-43
23.4.7 Community Use 23-44
23.4.8 Decline & Current Status 23-44
23.5 Macquarie Perch, *Macquaria australasica* 23-46
23.5.1 European Discovery 23-48
23.5.2 Aboriginal Names 23-48
23.5.3 European Names 23-49
23.5.4 Distribution and Habitat 23-49
23.5.5 Translocations 23-51
23.5.6 Size 23-52
23.5.7 Migrations 23-52
23.5.8 Community Value 23-53
23.5.9 Decline & Current Status 23-53
23.6 Catfish, *Tandanus tandanus* 23-56
23.6.1 European Discovery 23-58
23.6.2 Aboriginal Names 23-58
23.6.3 European Names 23-59
23.6.4 Distribution and Habitat 23-59
23.6.5 Translocations 23-60
23.6.6 Size 23-61
23.6.7 Nesting 23-61

23.6.8 Community Use 23-61
23.6.9 Decline & Current Status 23-62
23.7 River Blackfish, *Gadopsis marmoratus*, & Two-spined Blackfish, *Gadopsis bispinosus* 23-64
23.7.1 European Discovery 23-66
23.7.2 Aboriginal Names 23-66
23.7.3 European Names 23-66
23.7.4 Distribution and Habitat 23-67
23.7.5 Translocations 23-68
23.7.6 Size 23-69
23.7.7 Community Value 23-69
23.7.8 Decline & Current Status 23-69
24 Australian Aboriginal Fisheries 24-1
24.1 Wooden Weir Fish Traps 24-6
24.1.1 Boughyards in the Main Rivers 24-7
24.1.2 Stone Fisheries 24-8
24.1.3 Management Practices 24-12
25 Recommendations 25-1
26 References 26-1
Index

List of Figures **Page No**

Figure 8.1	The Goulburn River Catchment showing major waterways and key localities	8-3
Figure 8.2	Historical Records for Murray cod and Trout cod in the Goulburn River Catchment	8-14
Figure 8.3	Historical Records for Native Fish Species other than Cod in the Goulburn River Catchment	8-15
Figure 9.1	The Mitta Mitta River Catchment showing major waterways and key localities	8-3
Figure 9.2	Historical Records for Murray cod and Trout cod in the Mitta Mitta River Catchment	8-11
Figure 9.3	Historical Records for Native Fish Species other than Cod in the Mitta Mitta River Catchment.	8-12
Figure 9.1	The Mitta Mitta River Catchment showing major waterways and key localities	9-3
Figure 9.2	Historical Records for Murray cod and Trout cod in the Mitta Mitta River Catchment	9-11
Figure 9.3	Historical Records for Native Fish Species other than Cod in the Mitta Mitta River Catchment.	9-12
Figure 10.1	The Upper Murray River Catchment showing major waterways and key localities	10-3
Figure 10.2	Historical Records for Murray cod and Trout cod in the Upper Murray River Catchment	10-10
Figure 10.3	Historical Records for Native Fish Species other than Cod in the Upper Murray River Catchment	10-11
Figure 11.1	The Kiewa River Catchment showing major waterways and key localities.	11-3
Figure 11.2	Historical Records for Murray cod and Trout cod in the Kiewa River Catchment	11-7
Figure 11.3	Historical Records for Native Fish Species other than Cod in the Kiewa River Catchment	11-8
Figure 12.1	The Ovens River Catchment showing major waterways and key localities.	12-3
Figure 12.2	Historical Records for Murray cod and Trout cod in the Ovens River Catchment	12-11
Figure 12.3	Historical Records for Native Fish Species other than Cod in the Ovens River Catchment	12-12
Figure 13.1	The Broken River Catchment showing major waterways and key localities.	13-3
Figure 13.2	Historical Records for all Native Fish Species in the Broken River Catchment.	13-9
Figure 14.1	The Campaspe River Catchment showing major waterways and key localities.	14-3
Figure 14.2	Historical Records for Native Fish in the Campaspe River Catchment	14-10
Figure 15.1	The Central Murray River Catchment showing major waterways and key localities	15-3
Figure 15.2	Historical Records for Murray cod and Trout cod in the Central Murray River Catchment	15-19
Figure 15.3	Historical Records for Native Fish Species other than Cod in the Central Murray River	15-19
Figure 16.1	The Loddon River Catchment showing major waterways and key localities.	16-3
Figure 16.2	Historical Records for Native Fish in the Loddon River Catchment	16-11
Figure 17.1	The Macquarie River Catchment showing major waterways and key localities	17-3
Figure 17.2	Historical Records for Murray cod and Trout cod in the Macquarie River Catchment	17-12
Figure 17.3	Historical Records for Native Fish Species other than Cod in the Macquarie River Catchment.	17-12
Figure 18.1	The Lachlan River Catchment showing major waterways and key localities	18-3
Figure 18.2	Historical Records for Murray cod and Trout cod in the Lachlan River Catchment	18-10
Figure 18.3	Historical Records for Native Fish Species other than Cod in the Lachlan River Catchment	18-10
Figure 19.1	The Murrumbidgee River Catchment showing major waterways and key localities	19-3
Figure 19.2	Historical Records for Murray cod and Trout cod in the Murrumbidgee River Catchment	19-15

Figure 19.3	Historical Records for Native Fish Species other than Cod in the Murrumbidgee River Catchment	19-15
Figure 20.1	The Riverina Catchment showing major waterways and key localities.	20-3
Figure 20.2	Historical Records for Native Fish in the Riverina Catchment	20-9
Figure 21.1	The Lower Murray River Catchment showing major waterways and key localities	21-3
Figure 21.2	Historical Records for Native Fish in the Lower Murray River Catchment	21-11
Figure 23.1	A Reconstruction of the Historical Distribution & Abundance of Trout Cod in the Southern Murray-Darling Basin	23-21
Figure 23.2	A Reconstruction of the Historical Distribution & Abundance of Murray Cod in the Southern Murray-Darling Basin	23-30
Figure 23.3	A Reconstruction of the Historical Distribution & Abundance of Golden Perch in the Southern Murray-Darling Basin	23-38
Figure 23.4	A Reconstruction of the Historical Distribution & Abundance of Silver Perch in the Southern Murray-Darling Basin	23-45
Figure 23.5	A Reconstruction of the Historical Distribution & Abundance of Macquarie Perch in the Southern Murray-Darling Basin	23-55
Figure 23.6	A Reconstruction of the Historical Distribution & Abundance of Freshwater Catfish in the Southern Murray-Darling Basin	23-63
Figure 23.7	A Reconstruction of the Historical Distribution & Abundance of Blackfish Species in the Southern Murray-Darling Basin	23-71
Figure 24.1	Brewarrina Stone Fisheries	24-9
Figure 24.2	Locations of Historical Accounts of Aboriginal Fishing Structures & Conservation Areas	24-14

List of Tables **Page No**

Table 6.1	Key External Features of Murray cod & Trout cod	6-3
Table 8.1	Goulburn River Catchment Rarity Scores (Main River Channels)	8-13
Table 9.1	Mitta Mitta River Catchment Rarity Scores	8-10
Table 9.1	Mitta Mitta River Catchment Rarity Scores	9-10
Table 10.1	Upper Murray River Catchment Rarity Scores (Main River Channels)	10-9
Table 11.1	Kiewa River Catchment Rarity Scores (Main River Channels)	11-6
Table 12.1	Ovens River Catchment Rarity Scores (Main River Channels)	12-10
Table 13.1	Broken River Catchment Rarity Scores (Main River Channels)	13-8
Table 14.1	Campaspe River Catchment Rarity Scores (Main River Channels)	14-9
Table 15.1	Central River Catchment Rarity Scores (Main River Channels)	15-18
Table 16.1	Loddon River Catchment Rarity Scores (Main River Channels)	16-10
Table 17.1	Macquarie River Catchment Rarity Scores	17-11
Table 18.1	Lachlan River Catchment Rarity Scores (Main River Channels)	18-9
Table 19.1	Murrumbidgee River Catchment Rarity Scores (Main River Channels)	19-14
Table 20.1	Riverina Catchment Rarity Scores (Main River Channels)	20-8
Table 21.1	Lower Murray River Catchment Rarity Scores (Main River Channels)	21-10
Table 23.1	Definitions of Rarity Scores used in the Project	23-2
Table 23.2	Trout cod Average Rarity Scores	23-8
Table 23.3	Murray cod Average Rarity Scores	23-25
Table 23.4	Golden perch Average Rarity Scores	23-35
Table 23.5	Silver perch Average Rarity Scores	23-42
Table 23.6	Macquarie perch Average Rarity Scores	23-50
Table 23.7	Catfish Average Rarity Scores	23-59
Table 23.8	Blackfish Average Rarity Scores	23-67
Table 23.9	ASFB Conservation Status of Murray-Darling Basin Fishes	23-72

List of Photographs **Page No**

Photograph 5.1	The First Trout Cod	5-9
Photograph 5.2	Blandowski's Trout Cod	5-16
Photograph 5.3	Gunther's Drawing of a Trout Cod	5-17
Photograph 5.4	Castelnau's Trout Cod	5-17
Photograph 5.5	Trout Cod or Murray Cod?	5-18
Photograph 5.6	An Artist's Work	5-19
Photograph 5.7	Oligorus gibbiceps	5-19
Photograph 5.8	The First Photograph	5-24
Photograph 5.9	Whitley's Trout cod	5-25
Photograph 5.10	A Feature Article on a Mythical Fish	5-26
Photograph 5.11	Lake Sambell Trout Cod	5-32
Photograph 5.12	Large Trout Cod from Lake Sambell	5-33
Photograph 6.1	Murray Cod and Trout Cod Compared	6-4
Photograph 6.2	Trout Cod Variations	6-5
Photograph 6.3	Trout Cod Heads	6-6
Photograph 7.1	Habitat Types of the Murray Darling Basin	7-6
Photograph 7.2	Variations in Photo Quality	7-7
Photograph 8.1	An Upland Catch	8-16
Photograph 8.2	Eildon Macquarie Perch	8-17
Photograph 8.3	Slopes Habitat in the Goulburn	8-18
Photograph 8.4	Trout Cod on a Pole	8-19
Photograph 8.5	A Morning's Catch at Alexandra	8-20
Photograph 8.6	Two Trout Cod at Molesworth	8-21
Photograph 8.7	Prospect Hill Trout Cod	8-22
Photograph 8.8	Homewood Cod Catch	8-23
Photograph 8.9	The McLeod's Livelihood	8-24
Photograph 9.1	The Big River	8-13
Photograph 9.2	Upper Mitta Mitta Trout Cod	8-14
Photograph 9.3	Mitta Mitta Cod Catch	8-15
Photograph 9.4	Big Cod from the Mitta Mitta	8-16
Photograph 9.1	The Big River	9-13
Photograph 9.2	Upper Mitta Mitta Trout Cod	9-14
Photograph 9.3	Mitta Mitta Cod Catch	9-15
Photograph 9.4	Big Cod from the Mitta Mitta	9-16
Photograph 10.1	Upper Murray Habitats	10-12
Photograph 10.2	Indi River Catch	10-13

Photograph 10.3	Towong Cod	10-14
Photograph 10.4	Tintaldra Trout Cod	10-15
Photograph 10.5	Tintaldra Cod Catch	10-16
Photograph 10.6	Trout Cod and Silver Perch at Burrowye	10-17
Photograph 10.7	Burrowye Cod Catch	10-18
Photograph 10.8	Huge Cod Catch at Burrowye	10-19
Photograph 10.9	Last Upper Murray Trout Cod	10-22
Photograph 12.1	Eurobin Catches	12-13
Photograph 12.2	Trout Cod from the Buffalo and Ovens Rivers	12-14
Photograph 12.3	Trout Cod from Lake Sambell	12-15
Photograph 12.4	Suffield Family Catches	12-16
Photograph 12.5	Last Trout Cod in the Ovens	12-17
Photograph 13.1	Broken River Trout Cod	13-10
Photograph 13.2	A Huge Macquarie Perch	13-11
Photograph 14.1	Upper Campaspe River	14-5
Photograph 14.2	Macquarie Perch at Redesdale	14-11
Photograph 14.3	Murray Cod at Redesdale	14-11
Photograph 15.1	Central Murray Beach	15-9
Photograph 15.2	Yorta Yorta Fish Traps	15-10
Photograph 15.3	Howlong Cod Catch	15-20
Photograph 15.4	Silver Perch at Yarrawonga	15-21
Photograph 15.5	Trout Cod at Tongalong	15-22
Photograph 15.6	Early Barmah Catch	15-23
Photograph 15.7	Golden Perch at Barmah	15-24
Photograph 15.8	Early Echuca Fishing Party	15-25
Photograph 15.9	Kow Swamp Catch	15-26
Photograph 15.10	Murray River Drought	15-27
Photograph 15.11	Pental Island Cod	15-28
Photograph 15.12	Trout Cod and Murray Cod near Swan Hill	15-29
Photograph 15.13	A Big Catch Near Euston	15-30
Photograph 16.1	Boort Cod Catch	16-12
Photograph 16.2	A Big Cod Shot	16-13
Photograph 16.3	A Ruined River	16-17
Photograph 17.1	Cuvier's Macquarie Perch	17-6
Photograph 17.2	Gunther's Golden Perch	17-7
Photograph 17.3	'The Forge'	17-13
Photograph 17.4	Long Point Cod	17-13
Photograph 17.5	Wellington Cod	17-14

Photograph 17.6	Burrendong Catch	17-14
Photograph 18.1	Lachlan River Trout Cod	18-11
Photograph 18.2	Cowra Catch	18-12
Photograph 19.1	William Hill's Cod Catch	19-8
Photograph 19.2	Colinton Gorge Trout Cod	19-16
Photograph 19.3	Preserved Colinton Trout Cod	19-17
Photograph 19.4	Gigerline Gorge Murray Cod	19-18
Photograph 19.5	Kambah Catch	19-19
Photograph 19.6	Murrumbidgee Trout Cod	19-20
Photograph 19.7	Hill Family Catches	19-21
Photograph 19.8	Bringagee Catch	19-22
Photograph 20.1	Mathoura Cod Catch	20-10
Photograph 20.2	Mathoura Trout Cod	20-11
Photograph 20.3	Billabong Creek Catfish	20-12
Photograph 20.4	Laddie's Catch	20-13
Photograph 20.5	Deniliquin Redfin Plague	20-16
Photograph 21.1	A Week's Work at Renmark	21-12
Photograph 21.2	A Large Catch at Renmark	21-13
Photograph 21.3	A Large Golden Perch	21-14
Photograph 21.4	Fishing Party Near Morgan	21-15
Photograph 21.5	They Call the Trout Cod the Rock Cod	21-16
Photograph 21.6	Purnong Trout Cod	21-16
Photograph 21.7	Lower Murray Macquarie Perch	21-17
Photograph 23.1	The First Trout Cod	23-5
Photograph 23.2	Big Trout Cod in the Past	23-18
Photograph 23.3	A Giant Trout Cod Today?	23-19
Photograph 23.4	The Seven Creeks: A Last Upland Refuge	23-20
Photograph 23.5	The First Murray Cod	23-24
Photograph 23.6	The First Golden Perch	23-33
Photograph 23.7	The First Silver Perch	23-41
Photograph 23.8	The First Macquarie Perch	23-48
Photograph 23.9	The First Catfish	23-58
Photograph 23.10	The First Blackfish	23-66
Photograph 24.1	Brewarrina Stone Fisheries	24-9
Photograph 24.3	Central Murrumbidgee River Stone Fishery	24-11

5 A Tale of Two Cod

NATURE NOTES AND QUERIES.

By DONALD MACDONALD.

MURRAY TROUT.

Referring to a note upon this subject, Major Semmens, chief inspector of fisheries, writes:—"Re 'Murray trout' in 'Nature Notes and Queries' of the 3rd inst., the fish described by Mr. Harvie is identical with what D. H. Stead calls a 'trout cod.' I prefer the term 'Murray trout.' The fish has been brought under Mr. Stead's notice in recent years, but has been known to many northern Victorian anglers as a Murray trout for a great number of years. It is a much smaller fish than the Murray cod, and, instead of being mottled like the latter, is spotted, although many of the spots are confluent. I have been looking out for a specimen for some time to get it scientifically examined as to whether it is really a *distinct species from the* Murray cod. It is, of course, also a member of the perch family.

Argus, 17 March 1911

NATURE NOTES AND QUERIES

By DONALD MACDONALD
MURRAY TROUT

Referring to a note upon this subject, Major Semmens, Chief inspector of fisheries, writes:- "Re 'Murray trout' in 'Nature Notes and Queries' of the 3rd inst., the fish described by Mr. Harvie is identical with what D.H.Stead calls a 'trout cod'. I prefer the term 'Murray trout'. The fish has been brought under Mr. Stead's notice in recent years, but has been known to many northern Victorian anglers as a Murray trout for a great number of years. It is a much smaller fish than the Murray cod, and, instead of being mottled like the latter, is spotted, although many of the spots are confluent. I have been looking out for a specimen for some time to get it scientifically examined as to whether it is really a distinct species from the Murray cod. It is, of course, also a member of the perch family.

Argus, 17 March 1911

5.1 The Setting

The genesis of the Murray-Darling Basin dates back to a time when the continent was a part of the southern super-continent known as Gondwana. At the end of the Cretaceous era, some sixty five million years ago, Australia remained attached to Antarctica. The convection forces within the Earth's mantle that drive plate tectonics, had already initiated the break-up of Gondwana with the departure of India, Africa and finally South America. Eventually a rift valley formed between Australia and Antarctica some 40 million years ago, leading to the separation of the two continents. The process produced a warping of the Australian Plate raising its eastern flank, while its centre and southern edge subsided, generating the primordial Murray-Darling Basin (Veevers, 1984). Australia drifted northwards and, during its journey, rises and falls in sea level driven by changes in climate as well as further movements of the continental crust resulted in shallow seas periodically invading and retreating from the basin. The most extensive period of inundation commenced thirty two million years ago, when the Murravian Gulf extended inland as far as present day Balranald. This epoch of inundation lasted for about the next twenty million years (Brown & Radke, 1989).

Westerly flowing rivers steadily eroded the eastern mountain chains, depositing their sediments to a depth of four hundred metres in the central depression. The deposits left by the periodic inundations of the Murray-Darling Basin and the rivers contain fossils revealing the inhabitants of these ancient waters including plants, crustaceans, fish and even whales. In 1940 fossils of a fish, which present day anglers would recognise as a 'cod', were discovered at Bugaldie near Coonabarabran (Hills, 1946). More recently, similar fossils have been discovered near Cooma (Taylor *et al.,* 1980). Dating techniques suggest that the fossils may have formed between seven and twenty six million years ago, with the possibility that they may be substantially older (Rowland, 2005). It is clear that cod-like fish species have been present in the Murray-Darling Basin for many millions of years. As the sea retreated, the receding waters carved a channel into present day South Australia. About 3.2 million years ago uplifting near Swan Reach effectively dammed the drainage creating a giant freshwater body known as Lake Bungunnia which extended upstream to about the present site of Robinvale. As the continent dried the giant lake receded and became increasingly saline, the Murray finally breaking through the barrier about seven hundred thousand years ago, adopting more or less its present course (Steavenson & Brown, 1989).

Comparatively late in its history, humans became inhabitants of the Murray-Darling Basin. It is uncertain as to how many times the ancestors of the first Australians made the passage across the waters of the Torres Strait, or exactly when this took place. In 1969 the oldest evidence of human occupation in the basin in the form of human remains was discovered near Lake Mungo in western New South Wales. Subsequent discoveries suggest a human presence at least 32 000 years ago, possibly much longer. Along with the bones of humans, the sands of Mungo have revealed middens containing the skeletal remains of fish which clearly formed an important component of the diet of the people, who must have viewed the bountiful waters of the ancient Lake Mungo as a bonanza. Over the millennia the aboriginal nations of the Murray-Darling Basin developed a profound knowledge of its idiosyncratic rivers and their piscine inhabitants, learnt through the hardships endured by El-Nino generated boom/bust cycles superimposed on long term climate fluctuations. Unfortunately they left no written record of that experience, but their understanding could have provided us all with a much greater insight to the rivers as they once were. With the destruction of their society and disintegration of their culture by Europeans that knowledge has been largely lost save for the written accounts by the early colonials and the traditional stories that have survived. The crossing of the Great Dividing Range by Blaxland, Wentworth and Lawson in 1813 provided the first opportunity for Europeans to encounter the fish of the Murray-Darling Basin. Those first tentative steps into the basin by Europeans signalled not only the beginning of a cataclysm for the aboriginal nations of the Murray-Darling but of its entire ecology.

5.2 Discovery

The first European account describing the existence of fish ultimately to be known as 'cod' comes from the journal of George Evans who was sent on a journey of exploration to the interior by Governor Lachlan Macquarie. Departing from Emu Plains in November 1813, Evans crossed the Great Dividing Range, and on the 30th of November encountered the upper reaches of a stream at the Evans Crown Reserve near Tarana. On that date he recorded in his journal 'leading into a fine valley at the end I met a large Riverlett arising from the Southern Hills. We shot ducks and caught several trout weighing at least 5 or 6 pounds each' (Mackaness, 1965). His party followed the river downstream, and there are many references to the fish in his journal, in particular describing their astonishing abundance. This ultimately prompted Evans to name the waterway the Fish River. Soon after Evans' return, William Cox was charged by Governor Macquarie with the task of the construction of a road over the Blue Mountains to the region. On November 23 an advance party led by a J. Tye travelled to the Fish River to identify suitable crossing points. Cox recorded their return in his journal on November 27:

> At 5 p.m. J. Tye and his party returned from the Fish River. They brought some fish with them, which proved to be rock cod, weighing about 5 lb. each. / During their stay they caught 10 fish, and state that had the water not run so strong they would have caught as many as they pleased (Mackaness, 1965).

Cox's journal makes a number of subsequent references to further fish being caught. It contains the first written use of the word 'cod' for the large fish of the western rivers, without any explanation for its origin.

Lachlan Macquarie, in company with Evans and the Surveyor General, John Oxley, in May 1815, travelled to the colonial outpost established at the junction of the Fish and Cambell Rivers. Macquarie surveyed a site for a town on the banks of the Macquarie River, just downstream from the junction, naming it Bathurst on May 7th. What is generally believed to have been Macquarie's account of the journey (Mackaness, 1965) was more likely penned by Allan Cunningham, an identical account being credited to him (Cunningham, 1816). The account elaborated, provides an explanation for the use of the word 'cod' for the fish of the Bathurst region:

> All around Bathurst abounds in a variety of game; and the two principal rivers contain a great quantity of fish, but all of one denomination, resembling the perch in appearance, and of a delicate and fine flavour, not unlike that of a rock cod. This fish grows to a large size, and is very voracious. Several of them were caught during the Governor's stay at Bathurst, and at the halting-place on the Fish River. One of those caught weighed 17 lb.; and the people stationed at Bathurst stated they had caught some weighing 25 lb. (Cunningham, 1816).

The initial descriptions of the fish as 'rock cod' was almost certainly in reference to the saltwater rock cod, *Epinephelus daemelii,* frequently captured from the waters of Port Jackson and esteemed as a table fish by the colonists. This origin for the word cod was clearly iterated in a latter account: 'The Lachlan, Macquarie, and other rivers in the interior abound with fish of a large size and fine flavour: they have not, I believe, been properly described as yet, but resemble the rock cod and mullet of the sea coast' (Atkinson, 1826).

The first naturalists to visit the upper Macquarie were French. In 1822 the *Coquille* under the command of Captain Louis Duperrey, set sail from Toulon studying Natural History throughout the southern hemisphere. Key members of the crew held the responsibility of documenting and collecting specimens from the various disciplines of natural history which they were assigned. The surgeon Prosper Garnot, and his assistant Rene Lesson, were allocated the responsibility for zoology, with Garnot electing to study mammals and birds. The *Coquille* arrived in Port Jackson on the 17th of January 1824, and the crew called upon the new Governor of the colony of New South Wales, Sir Thomas Brisbane. Brisbane authorized and provided support for the French

to carry out an expedition to the upper Macquarie led by Garnot and Lesson. A high priority was to acquire specimens and knowledge of the platypus referred to by the French as 'paradoxes'. Garnot and Lesson stayed at Bathurst on the 4th and 5th of February, in the care of their host Mr. Morisses who commanded the garrison stationed there. Upon the return of the *Coquille* to France in March 1825, Lesson lodged with the Museum National D'Histoire Naturelle in Paris the fish and other specimens collected during the Bathurst expedition. He published a detailed account of the natural history encountered during his journey over the Blue Mountains (Lesson, 1825), which was later roughly translated into English and popularised in the *Edinburgh New Philosophical Journal* (Lesson, 1828). Lesson reported the existence of two species of fish he collected from the Macquarie River, describing his encounter with the fish in the following modern translation:

> The Macquarie River, not very wide or deep, has banks covered with European plants. One finds there Potamogelous, aquatic Rununculus, Lythrum salicaria, Samolus valerandi, Polygonum avicularis – or a closely-related species, etc. I found there fish that form two new genera – the first species, named Gryptes Brisbanii, of the family of Percoides, and the second species called Macquaria Australasiae (1). They attain a large size, and their flesh is held in high regard. The Gryptes is often three feet long, and nearly sixty pounds in weight. (1) By Messrs Cuvier and Valenciennes, Catalogue of the collections that we have brought back to the Museum. - I have proposed the name Gryptes Brisbanii for the first in honour of the Governor of South Wales, who received us enthusiastically (Lesson, 1828).

The 1828 English translation for the footnote stated: So named by MM. Cuvier and Valenciennes Collections which we brought to the Museum of Gryptes Brisbanii for the first, in honour of the Governor of New South Wales, who received us with the greatest kindness (Lesson, 1828). One specimen of Lesson's *Gryptes* and another of *Macquaria* were ultimately deposited and catalogued at the Museum National D'Histoire Naturelle. Lesson apparently named the second species *Macquaria Australasia,* referring to its source the Macquarie River, and its southern location. For *Gryptes Brisbanii* it is clear that the fish honours Sir Thomas Brisbane as Lesson stated, but the origin of the term *Gryptes* is not apparent.

Johann Kuefer, later known as Barron Georges Cuvier, was, in the early decades of the nineteenth century, one of the world's leading taxonomists. His work with fish commenced in 1801 and was later supported by his student Achille Valenciennes. Together, between 1828 and 1848, they produced *Histoire naturelle des poissons* naming and describing over 5000 species of fish, completed by Valenciennes after Cuvier's death in 1832. From Lesson's account, it is implied that Cuvier and Valenciennes supported the names for the two species of fish collected at Bathurst, and it is likely that they had a hand in creating them. In 1802 politician and naturalist Bernard de Lacépède published his work *Histoire naturelle des poissons* in which he provided a description, and illustration, of a fish from the Carolinas in the United States which he named *Labrus salmoides,* now known as *Micropterus salmoides,* the American largemouth bass. Subsequently in 1829 Cuvier provided his own name and description for the same fish, erecting the genus *Grystes*, the term 'gryste' meaning to growl or grunt, a characteristic of largemouth bass apparently incorrectly attributed to it (Gallaher, 1937). What followed was a description of the cod specimen from Bathurst presented in this modern translation (Cuvier, 1829):

> The Growler of River Macquarie (*Grystes Macquariensis*, nob.)
> The most essential characteristics of the growler of America were also found in a fish of the Macquarie River in New Holland, which in its shape, however, resembles more the common perch. Mainly by the height of the nape of the neck, from where its profile goes down obliquely. Its muzzle is also more elongated than the growler's, and it is rather its upper jaw that exceeds the other. Its scales, especially those of the back, are smaller than the growler's, and its spinal and anal fins are much more compared to all the other fish of this family. The thorny part of the dorsal is separated from the soft part by marked a fairly noticeable notch. The

cheek is a bit 'inflated'. There are no teeth neither in the under-orbital nor in the preoperculum, which does not have even a distinct edge. The osseous cover, operculum, has only a small pointed spine. The first pivot of the dorsal is very small; the others very strong. The soft part is higher, shorter and rounded. The caudal one is square, and has its corners rounded.

B. 7; D. 11/14; A. 3/12; C. 17; P. 19; V. 1/5

The colour of this fish (in the alcohol) appears a purplish grey, paler below, sown with cloudy blackish spots, poor and irregular. The edge of the soft part of the dorsal and the anal, and the two edges of the caudal close to its corners, are white. Our individual is ten inches long. The liver of this grystes is large, located transversely under the œsophagus, and it forms only one triangular lobe, of which the sharpest corner is prolonged in the left of the abdomen. The œsophagus is broad and short; the stomach narrow, elongated, a little curved and rounded at the back. Its walls are very thick, and their internal surface is furrowed by large irregular wrinkles. The rising branch that leads to the pylorus is large, because the thickness of its walls; but its channel is narrow. The pylorus is provided with 3 very short cœca, one on the left and two on the right. The intestine is of medium length; it goes down a little further that the stomach, where it bends and returns up to the ascending branch of the stomach; it makes a second turn there, and it goes to the anus. With each fold the diameter of the intestine decreases, and its walls are thicker. This greater thickness also exists for the duodenum; but its diameter is large. The spleen is oval, elongated and located on the duodenum. The flotation bladder is very large, simple, and oval, with silvery walls, much thicker in the posterior part. The kidneys meet in a large single lobe, near the anus, and they empty the urine into the bladder, which has very thick walls, where they form a kind of rather broad cone, which goes up between the seminal glands. The stomach was empty (Cuvier, 1829).

Noted illustrator Felix Guérin-Méneville provided a colour lithograph of the specimen of *Grystes macquariensis* in the *Iconographie du Regne Animal de Cuvier*, a supporting work published as a series between 1829 and 1838, and eventually as a complete work (Guérin-Méneville, 1829, 1838).

The following year Lesson published his description for the fish he collected from the Macquarie. Lesson provided a location for the capture of the type specimen (Macquarie River opposite Bathurst) and also described the size of fish encountered as follows in this translation:

101 Growler De Brisbane. *Grystes Brisbanii*, Less.

LESS., Ann. sc. nat. ; (November 1825).

Grystes Macquariensis, Cuv., Poiss. (fish), vol. III, p. 58 (1829), and

Guérin, l c., pl. V, f. 2.

B. 7; p. 19; d. 11/14: cat. 1/5; a. 1/12; c. 17

The grystes, whose generic name translated into French by Mr Cuvier as growler (grogneur) is used in the state of New York to designate the labre salmoïde Lacépède, are fish of the family percoïdes, not having any canines, but many velvet teeth, and the preoperculum without any serration on its edge. Only two species of them are known, one in the United States, and the other in New Holland. The latter we discovered in the Macquarie river, opposite Bathurst, on the painful trip that we made beyond the Blue Mountains. It is commonly 10 inches long, although we saw individuals of them more than two feet long, and there are individuals weighing up to sixty pounds, according to the statement of Mr Morisses, governor of the military post. The specific name of Brisbane will commemorate a governor of the southern English colony, a member of the Institute of France, who singularly supported us in our research of natural history, and to whom we are indebted for having been able to undertake various excursions in the interior districts of the county of Cumberland. This growler is lengthened, compressed on the sides, thinned towards the tail, with a sloping faceline, and with a snout consequently rather acute, and rather thin compared to the high nape of the neck. The lower jaw is thin,

> overhung by the upper jaw. Its eye is large, rounded. The operculum, which ends in an acute point, and the preoperculum, are covered with tiny and very tight scales. The scales on the body are also small, regular, and a little rough. The dorsal spines are straight, thick, the first being shortest, and overflow the membrane. The latter is lowered and indented at the point where it receives the first articulated radius of the soft dorsal, which is higher than the spiny one, with a round edge. The pectoral one is oval. The catopes have their anterior spines less long than the braided radii. The three spines dorsal are short and equal; the fin with radii is short, a little angular. The caudal one is indented little or almost rectilinear. This fish is of a uniform purplish-grey colour all over. Spots, round or oval, russet-red, cover the back, the sides and the jowls. The pectoral ones are fair. The edges of the soft dorsal and the anal fin are white. The colonists of Bathurst esteem this fish, which they call in English "freshwater perch" (Lesson, 1830).

In his description Lesson used the generic name *Grystes* instead of *Gryptes* used in his 1825 account of their capture. The absence of the term *Gryptes* in his reference to this account implies that it was his intention to name the fish *Grystes*. Clearly in 1825 someone intended that the term *Grystes* be used both for the American large mouth bass and the fish from Bathurst, most likely Cuvier who was the recognized authority in fish taxonomy. Lesson's use of *Gryptes* may have either been a typological error by the printer from a written draft, or a misunderstanding on his part of the term created by Cuvier. They clearly disagreed on the proposed species name for the fish. Years later Valenciennes apparently claimed authorship for naming the two species of *Grystes* (Valenciennes, 1847). What is clear is that the principals involved in naming the cod captured at Bathurst agreed that the overhanging upper jaw was an obvious external distinguishing feature, separating it from the American large mouth bass.

Once passage over the Blue Mountains had been accomplished, colonial exploration and settlement expanded, and more accounts were written of the Murray-Darling fish. Various authors employed the names 'rock cod', 'cod fish', 'river cod', 'cod perch', 'Macquarie cod', 'Lachlan cod' and ultimately 'Murray cod'. George Bennett in his account of the fish of the Yass and Murrumbidgee Rivers, discussed the "river cod": 'They are named by the colonists "river cod;" and by the aborigines "Mewuruk". In the Tumut country, varieties of the "river cod" are called by the natives Bewuck, Mungee, &c' (Bennett, 1834). This strongly implies that the indigenous peoples of the region believed in the existence of more than one type of cod. Bennett's writings included a footnote: 'This fish is of the family of perches, and probably the same as described by the French naturalists, as a new genus, under the name Gryptes Brisbanii' (Bennett, 1834). This demonstrates that contemporary Australian naturalists were familiar with Lesson's initial naming of *Gryptes brisbanii* in 1825 and probably its subsequent descriptions. The claim of multiple cod species was repeated by Bennett many years later adding that the two were varieties or species of the 'river cod': 'In the Tumut country, there are supposed to be varieties or other species of the River Cod, named by the blacks of that district, 'Berwuck' and 'Mungee'' (Bennett, 1864). On first reading it is tempting to accept Bennett's aboriginal names as specifically attributed to two types of cod. Other authors have identified the term 'mungee' as meaning fish in general rather than a specific type of fish (e.g. Robinson, 1845; Clarke, 1860; Clark, 2000) and this is supported by the fact that the word was used by aboriginal groups outside the Murray-Darling Basin. It is plausible that the terms 'Mewuruk' and 'Bewuck' may have been used for two types of cod which from Bennett's physical description the former is likely to apply to the Murray cod, but this is only a possibility.

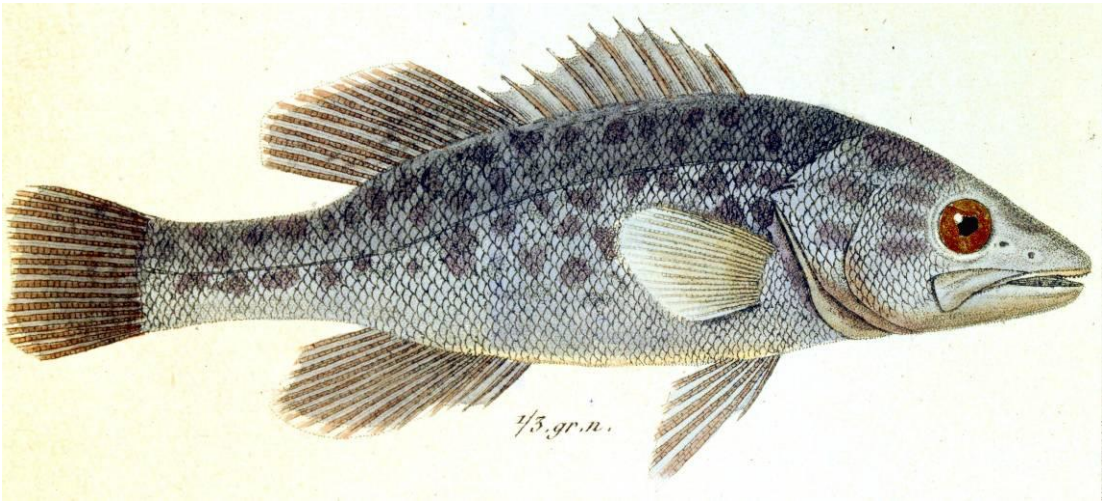
Major Thomas Mitchell provided numerous accounts of the fish encountered during his four expeditions into the Murray-Darling Basin. Prior to embarking on his first expedition, he recorded in his journal on December 12, 1831, eating cod at Bathurst and so was familiar with what was known then as the Bathurst cod fish. Then on January 24, 1832, in a footnote in his journal, Mitchell provided a brief description of a type of cod captured from the Peel River along with an excellent illustration. He named the species *Acerina Gristes Peelii mihi* and the following description are recognised by modern taxonomists as applying to the Murray cod:

> Family, Percidae; Genus, Acerina; subgenus, Gristes, Cuv. or Growler; Species, Gristes Peelii mihi, or Cod-Perch. Colour, light yellow, covered with small irregular dusky spots, which get more confluent towards the back. Throat pinkish, and belly silvery white. Scales small, and concealed in a thick epidermis. Fins obscure. The dorsals confluent. The first dorsal has 11 spines, and the caudal fin is convex (Mitchell, 1838).

Mitchell was well read and aware of the differences between the fish he encountered in the western rivers, and the description provided by Cuvier and Valenciennes. He clearly stated so in his footnotes:

> Observation: This fish may be identical with the fish described by MM. Cuvier and Valenciennes Volume 3 page 45 under the name of Gristes macquariensis: but it differs from their description in not having the edge of the second dorsal and anal white; and besides is in many respects very different from the figure given by M. Guerin of the Gristes macquariensis in the Iconographie du Regne Animal (Mitchell, 1838).

Photograph 5.1 The First Trout Cod



Above: Lithograph of *Gristes macquariensis* created by Felix Guérin-Méneville of the holotype for Trout cod published in *Iconographie de regne animal de G. Cuvier, Vol 1,* in 1836. The illustration depicts the specimen collected by Rene Lesson from the Macquarie River at Bathurst in February 1824 and named by him *Grystes brisbanii.* Reprinted with permission from the Rare Books Collection, *State Library of Victoria*.

Below: Photograph of the same specimen which survives to this day. The image has been reversed to match the illustration. Richardson cast aspersions on the ability of the French to create accurate illustrations of their specimens. An objective opinion would be that Guérin-Méneville created a reasonably faithful representation of the specimen. Photograph by Claude Ferraro, copyright of the *Museum National D'Histoire Naturelle,* Paris.

5.3 Genesis of an Argument

In October 1839 the ships *Erebus* and *Terror,* under the command of Captain James Ross, set sail from England on a journey to locate the south magnetic pole and chart the Antarctic continent, the latter which had eluded Captain James Cook. Australian zoological specimens were collected, the expedition subsequently returning to England in 1842 (Ross, 1847). The experienced ichthyologist Englishman John Richardson received the specimens after the return of the expedition. He subsequently prepared *Ichthyology of the voyage of H. M. S. Erebus and Terror, under the command of Captain Sir James Ross* which included many descriptions and illustrations of the fish encountered on the expedition. Included was one for the Australian 'cod perch':

> Grystes macquariensis. In Mitchell's Expeditions in Australia, Pl. 6, f. 1 represents a fish locally named 'cod perch,' and to which the author has given the specific name of Grystes peelii, because it varies in some respects from the description of G. macquariensis in the Histoire de Poissons, and does not correspond with Guerin's figure in Iconographie de Regne Animal. Our specimens have the pale margins to the dorsal and anal, which exists in macquariensis, but which peeli is said to want. Their form, however, is that of Mitchell's fish, and as they agree sufficiently with the detailed description in the Histoire des Poissons, the probability seems to be macquariensis and peeli are but one species, and that Guerin's figure, as in many other instances, has been carelessly drawn (Richardson, 1845).

Richardson concluded that there was only one species of cod, focusing on Mitchell's observation of his example of *peelii* lacking obvious white margins on the fins, ignoring a key characteristic of *macquariensis* being the overhanging upper jaw identified by the French. Richardson had obtained a number of cod specimens between 6 and 18 in. long, including an example of Mitchell's *peelii* as demonstrated by his illustration. If Richardson had seen a specimen of the French *macquariensis* he might have formed a different opinion.

In 1859 Albert Gunther, of the British Museum, determined that the American and Australian species of *Grystes* represented separate genera based on a number of characters notably that the American species had many pyloric caecae (gut pouches) and that from Australia few. He erected the genus *Oligorus* for the Australian fish the term implying 'few openings', referring to the few gut pouches (Gunther, 1859). Gunther too missed the significance assigned by the French to the overhanging upper jaw or, having separated the Australian cod from the largemouth bass into a new genus, considered it now irrelevant. Gunther followed Richardson's lead in recognising only one species of cod, *Oligorus macquariensis*, though his description of 'Brownish grey, with irregular dark spots' suggests that he may have possessed a specimen resembling the French fish. This is confirmed by the drawing he subsequently published in 1880 which is clearly a Trout cod, possessing an overhanging upper jaw and spotting (Gunther, 1880). In a later work, a contemporary from the British Museum, Albert Boulenger, recorded the coloration of the species as being 'Greyish or olive, spotted or dotted' (Boulenger, 1895). It appears that Richardson's cod specimen was lost, and may have denied Gunther the opportunity of examining both species. In fairness to both Richardson and Gunther, they worked during an era when there was no clear cut definition of what constituted a 'species'. Carolus Linnaeus, the father of modern taxonomy in the 18th century, based his notion of a species on the existence of readily identifiable 'ideal forms' with clear cut differences from other 'ideal forms'. The Linnaean species concept accepted that variations did occur from these forms, but considered that they should be ignored. These ideas may have influenced people like John Richardson and Albert Gunther in reaching their decisions on the two types of cod. It was all very vague, subjective and open to individual interpretation. Taxonomists themselves became classified as 'splitters', those with a tendency to highlight differences between organisms, and 'lumpers', those who highlighted the similarities and who acted accordingly when deciding the taxonomic status of organisms.

Polish born emigrant Wilhelm Blandowski arrived in Australia in 1849, and derived a living from a number of vocations. From an early date, however, he engaged in the recording and study of natural history. In June 1854 he was appointed government zoologist for the Victorian Museum of Natural History, and was subsequently a founding member of the Philosophical Society of Victoria. Blandowski undertook an expedition to the Murray River between the Gunbower area and the Murray-Darling Junction region, with an extended stay at Chaffee's Landing during 1857 collecting over 17 000 specimens (Kean, 2005). He later published an account of the nineteen types of fish he encountered during the expedition, where he used the names *Gristes Macquariensis* and *Gristes Peeli,* indicating that he was familiar with the original descriptions for the two cod species (Blandowski, 1858). His report published illustrations of the two types of cod, and he preserved specimens of both *peeli* and *macquariensis*, without providing provenances, which survive in the collection of *Museum Victoria.* Blandowski provided aboriginal names for the two cod species indicating that both were familiar to the indigenous people, the Yarree Yarree (Jari Jari), of the lower Murray in Victoria:

> Gristes Macquariensis (S) "Yaturr", of the Yarree Yarree. Is of a dirty green colour and has less spots, than Gristes Peeli. In both the scales are small and covered by an epidermis. Both are characteristic forms of the Murray River and its tributaries, and the principle fishes on which the natives subsist during the greater part of the year. They grow from 36 to 40 inches in length.' 'Gristes Peeli (J) "Barnta", of the Yarree Yarree. This fish, as well as the preceeding, No. 13, have both been already observed in America (Blandowski, 1858).

There is some doubt as to whether the collection of the cod specimens, and the creation of the drawings by Blandowski, actually took place during the 1857 expedition. The original drawing of *Gristes peeli,* which survives in the Historische Arbeitsstelle Museum fur Naturkunde in Berlin, contains the inscription 'am Murray den 27. Januar 1850 Blandowski' indicating that the drawing was created well before the expedition to the Darling junction (Hannelore Landsberg, pers. comm.). A similar background can be inferred for the drawing of *Gristes macquariensis*, the original of which has not been located. Blandowski is also likely to have deposited specimens at the National Museum of Victoria from 1854 onwards, when he was appointed government zoologist.

It can be reasonably concluded that Blandowski's report in 1858 represented his collective experience gathered from all his sojourns into northern Victoria rather than just that obtained from the Darling junction region. Altogether Blandowski's work was of great value, not only recording natural history, but details of aboriginal life and culture at an early date. Upon his return from the expedition, Blandowski presented his findings to the Philosophical Institute and initiated a furore, creating provocative descriptions and names for some specimens. His reputation in tatters he fled Australia with much of his original work and returned to Europe where he died in relative obscurity (Humphries, 2003; Kean, 2005). His contemporaries failed to recognise the value of his work and his account of the two types of cod was ignored.

The *Deniliquin Pastoral Times* of March 11 1865 contained a brief news item reporting on recent angler success in the Edward River: 'Piscatoria. The disciples of old Isaac must at present be possessed of much patience to meet a reward. The river is too low for anything but small fish to be caught, still there have been some very nice perch and trout taken through the week'. The reference to the 'trout' indicates that the fishermen of the district by that time had assigned that name to a local variety of fish sharing some characteristics with the Brown trout of the mother country. In fact the use of the term 'trout' or 'Murray trout' by the fishermen of the region can be traced back to at least 1859, when a newspaper advertisement promoted that the Stead brothers of Sandhurst (Bendigo) 'had a regular supply of that delicious fish Murray cod, Golden Carp, Blackfish and Trout' (*Argus,* 13 August 1859). There is evidence that over the next fifty years the name continued in use by fisherman, before serious enquiries were made as to the identity of the 'trout' which ultimately was identified as being applied to a type of cod.

In 1855 Joseph Rice established the Moira Lake Fishing Company, later the Murray River Fishing Company, and while there is ample evidence that commercial fishermen had operated in the Murray-Darling Basin prior to this time, the company appears to have been one of the first to act on a large scale and develop distant markets. Their base was located on an island in Moira Lake near Barmah and, utilizing the knowledge and skills of the local indigenous Yorta Yorta people, the business grew into an industry initially supplying Bendigo and later other centres such as Ballarat and Melbourne. In 1861 the Acclimatisation Society of Victoria was formed out its predecessor the Zoological Society, its foundation being stimulated by a movement originating in Europe to distribute animals and plants considered of value around the world. The acclimatization movement not only introduced many exotic plants and animals to Australia but translocated indigenous flora and fauna perceived to be of value. At that time the first tentative steps were being taken in acclimatizing fish and the earliest efforts were with native fish (Wilson, 1857). Rice sought to expand his business by providing live fish to acclimatisation societies in Victoria as well as supplying native fish fingerlings to interests in Tasmania and England (*Riverine Herald,* 17 February 1864, 23 March 1864).

In March 1870 a newspaper report discussed the progress made in acclimatisation activities in Victoria. Reference was made to the successful introduction of the hare, the usefulness of sparrows and the survival of the first trout introduced to the state. It also reported that live fish had been supplied to the Avoca Acclimatisation Society, this information sourced from an article published in the local newspaper for the Echuca region, the *Riverine Herald,* on the 9th of March:

> Live fish from the Murray are being transported from that river to the waters of the Avoca. On Monday, as we learn from the Riverine Herald, 500 Murray cod and trout were forwarded to the Avoca Acclimatisation Society by Mr. Pascoe. / The fish were supplied by the Murray Fishing Company (*Australasian*, 12 March 1870).

The company also supplied native fish to Saville Kent in his efforts to acclimatise Murray River fish species in Western Australia. The shipments included Murray cod, Murray perch, Macquarie perch, Murray trout and other species (*Hobart Mercury,* 30 November 1911).

Francois Laporte, better known as Francois or Comte de Castelnau, was a French diplomat, naturalist and a council member of the Zoological and Acclimatisation Society of Victoria. Castelnau held a lifelong passion for the study of fish, and the reports of the 'trout' from the Murray being available for sale may have been the impetus to acquire some samples. Stating that the specimens had come from the Murray River, possibly acquired through the Melbourne Fish Market, he went on to provide a name and description of the fish (Castelnau, 1873). Surprisingly Castelnau, who studied under Cuvier in France, was either unaware or ignored the details of his mentor's description of *Grystes macquariensis*. He provided a detailed physical description of the second cod species based on two specimens, one large (30 inch) and one juvenile. Castelnau named the species *Oligorus mitchelli* and his description is almost identical to that used by biologists today for the fish now known as *Maccullochella macquariensis*:

> The genus Oligorus is thus restricted to the Murray Cod, but I believe that two distinct species are confounded under this name. The head much broader; the eye considerably larger, being contained only six times in the total length of the head and twice in the length of the snout to the anterior edge of the eye. The upper profile is more convex than in the usual sort. The upper jaw is longer than the lower jaw… The caudal is rather longer and more rounded. The colour is a livid grey, covered entirely with small round obscure spots. The fishmongers consider this fish as distinct, and give it the name Murray Perch (not the Golden Perch, which is a Dules) (Castelnau, 1873).

Of interest is the reported use, in the late nineteenth century, of 'Murray perch' for this type of cod instead of the *Macquaria ambigua*. This latter was reported to be marketed at the time by commercial fishermen as 'golden perch'. Morris (1898), in his dictionary of Australian words, assigns the term 'Murray-Perch' to *Oligorus mitchelli* and cites Garnet Walch's (1880) use of the term. Walch describes the fish as a 'less bulky, equally flavourless congenor' of the Murray cod. It is unclear whether these latter authors were simply repeating Castelnau's usage or learnt of the term independently. It is possible, with the decline in catches of the second cod species in many areas in the first half of the twentieth century, that the names were transposed thus resulting in contemporary use of the name 'Murray perch' for *M. ambigua.* Castelnau's description of the second type of cod precipitated an ongoing debate about the existence of two forms or species of cod in the Murray-Darling Basin with evidence of growing confusion.

Between 1878 and 1890 Frederick McCoy, the director of the Museum of Victoria, published his *Prodromous of the Natural History of Victoria*. Research for the project commenced in 1858 and the successive volumes contained many notes, descriptions and colour lithographs of the Victorian fauna. In the *Prodomous* McCoy discussed the two forms of cod:

> There is a very common opinion among the fish dealers and other observers that there are two distinct species confounded under the name of Murray Cod, the one with a narrow snout, and the other with a broadly-rounded blunt one, and it is easy to sort the two forms when a heap of fish is sorted. I am convinced, however, that the difference is sexual / (McCoy, 1884).

McCoy apparently reached the latter conclusion based on the examination of five fish for which he provided a table of comparative measurements, including two large adults being male and female. In addition to the discussion and data provided, McCoy included two colour lithographs of examples of cod. After his appointment as director of the museum he engaged a number of artists to record the appearance of the flora and fauna. Plate 86 in the *Prodromous* was an illustration of a small Murray cod (1 foot 7½ inches) drawn by artist Andrew Bartholomew in May 1882. Bartholomew had a long association with McCoy, preparing drawings and lithographs for nearly forty years. Plate 85 was drawn in 1858 by the talented Ludwig Becker, who perished shortly after on the ill-fated Burke and Wills expedition. This illustration was stated by McCoy to be of a male cod three feet four and a half inches in length and reported to have contained twenty full grown Murray crayfish. The direct reference to the fish being male implies that the fish was of the narrow snout form and Berra and Weatherly (1972) suggested that the illustration may have been of a Trout cod.

John Kean of *Museum Victoria* has undertaken considerable research into the artists and illustrations of the *Prodromous,* the Museum's website now providing a wealth of background information and unpublished illustrations. The provenance of the fish depicted in plate 85 remains unknown. Given the anatomical detail recorded by McCoy, and the observation of the crayfish in its stomach, it likely that the specimen was sourced from the Melbourne fish market and the illustration drawn in the laboratory. While the fish is distorted, possibly by its neck being broken, the head does show a resemblance to a Trout cod. Its form suggests that if the mouth were closed the upper jaw may overhang the lower. Some of Becker's original sketches show the eyes placed on the side of the head, which is more typical for a Trout cod than the Murray cod. Becker recorded in his own hand that the snout of the fish was 'blueish black'. If the specimen was a Trout cod then this may be the first reference to what would become a widely recognised feature of the species leading to the colloquial name 'bluenose'. Amongst the surviving material for the *Prodromous* are background notes and measurements of the cod examined, including comparisons between a twenty two inch specimen of the narrow snout form and a similar sized specimen of that with the broad snout. Arthur Bartholomew in May 1891 prepared a watercolour drawing for an unfinished lithograph of a cod which clearly records the body markings of a Trout cod. Whether the Becker illustration is of a Trout cod is still in question but there is little

doubt that McCoy did handle the two types of cod and the weight of evidence suggests that he did examine one three feet four and a half inches in length. McCoy's conclusion as to the differences between the two types of cod being sexual was, from his records, probably the product of the limited number of specimens examined. Had he encountered specimens of both sexes for the two forms he may have reached a different conclusion.

Tenison-Woods (1882) described both species of cod, repeating Castelnau's description for *mitchelli*, adding a few personal observations and suggesting that rivers north of Sydney held that species. Subsequent government publications similarly ascribed *O. macquariensis* to the western rivers, and *O. mitchelli* to the northern coastal rivers of N.S.W. Ramsay (1883) stated: 'Two species of Murray cod are recognised by naturalists, the Oligorus macquariensis, Cuv. et Val., and Oligorus mitchelli Castelnau'. All these authors from Castelnau to McCoy had obviously not consulted the original description of *macquariensis* by Cuvier, relying on those provided by Richardson and Gunther. Adding to the growing confusion was Sir William Macleay's description of another species of cod, based on a single juvenile fish collected from the Murrumbidgee River near Yass by local surveyor Charles Jenkins. The specimen clearly had a serious head deformity and was described many years later by Gilbert Whitley of the Australian Museum as 'teratological or pug-headed' (Whitley, 1937). Macleay assigned it to species status with the name *Oligorus gibbiceps,* literally meaning 'hump headed' (Macleay, 1885).

Douglas Ogilby commenced work with the *Australian Museum* in 1885 and in 1893 he published *Edible Fishes of New South Wales* where he discussed at length the issue of the two species of cod. Unlike some of his predecessors he recognized the significance of the overhanging upper jaw in the descriptions of both Cuvier and Castelnau. Ogilby cited Gunther as indicating that the lower jaw was longer (though no mention was made by Gunther of this characteristic in his original description; he described the mouth simply as 'large, protractile') and stated that in five specimens of cod which he personally examined and based his description on that the jaws were equal. Ogilby postulated that environmental conditions could affect other anatomical features of cod and ultimately concluded 'These four characters may, therefore, be at once be set aside as valueless' and went on to criticize Castelnau for 'the ingenuity with which the most important characters are entirely omitted, and trivial or secondary characters brought forward into prominence' (Ogilby, 1893). Close examination of his writing suggests that he based his conclusion on five specimens of Murray cod, and the only specimen of the other type he examined was Macleay's deformed *O. gibbiceps* which he described 'as merely a stunted Alpine form of O. Macquariensis' (Ogilby, 1893).

The excesses of both professional and amateur fishermen ultimately led to some regulation of the fishery, with the appointment of officers, or 'inspectors' as they came to be known, to ensure compliance with legal practice. One of the earliest was Assistant Inspector Osbourne Wilshire, based at Deniliquin, who had the unenviable job of policing much of the Murray River fishery centred on the Barmah Lakes. In his report on the Inland Fisheries for 1887, Wilshire wrote: 'The principal species of fish in these waters are Murray cod, trout, gold and silver perch, silver and black bream' (NSW Fisheries Report, 1888). During his time as inspector Wilshire collected numerous fish specimens, forwarding them to Sydney. Museum records suggest that some of these may have been 'trout' but there generally appears to have been very little interest. In May 1892 *The Adelaide Register* published a lengthy news story on the fish of the Murray River written by an un-named 'correspondent' from Blanchetown, believed to be W. J. (William) Nott. The author was clearly a highly experienced commercial fisherman who provided detailed observations on fish, crustaceans, turtles and birds. His first-hand experience dated back to before the great flood of 1870. The article provided a wealth of detail on the types of fish captured near Blanchetown and briefly discussed a fish called the 'rock cod':

> The rock cod are very rarely caught about here. The largest I have caught would be about 8 lb. and the smallest about 1 lb. Although they resemble a cod in many ways, the formation of their body is different. They also have a much larger eye than the cod, thus indicating that it is night when they obtain their food (*Adelaide Register*, 20 May 1892).

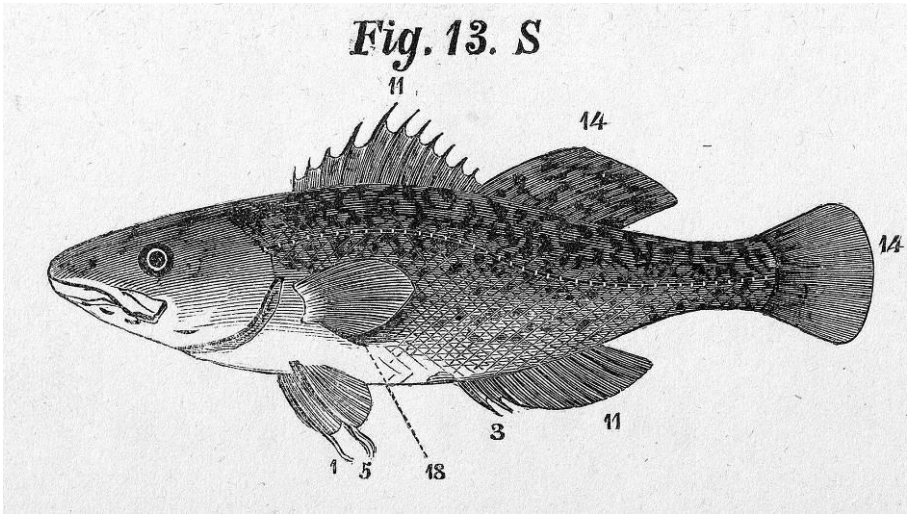
Irrespective of what the men of science thought, many fisherman in the late nineteenth century believed there were two species of cod in the Murray-Darling Basin. It is apparent that the term 'rock cod' was applied to distinguish a second form from the usual Murray cod, by fishermen like Nott (Stead, 1929b). Another name utilised was 'bluenose' describing the coloration of the snout in some specimens (Rhodes, 1999) along with the term 'trout' or 'Murray trout' employed by Deniliquin and Barmah fishermen (Stead, 1929b).

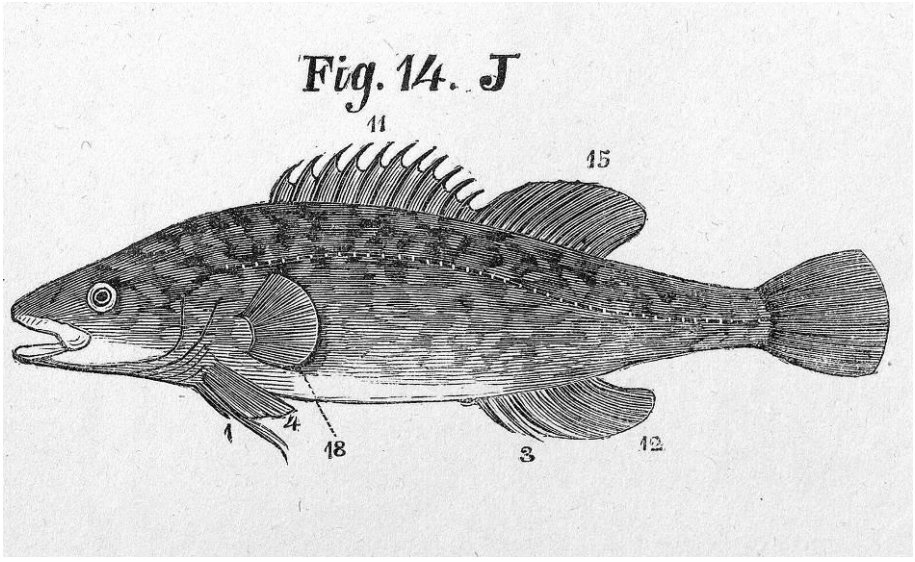
The reported capture of a fish from the Yarra River in the *Argus* newspaper in 1898 elicited an interesting response from a reader. The issue of September 8, 1898, described the existence in the Yarra of a second cod species:

> Murray Trout in the Yarra. Sir, - the fish referred to in your par. of yesterday as having been caught at Dight's Falls is what is known on the Murray as a Murray trout. It is closely allied to the Murray cod, but does not grow so large, and its habits are different. The cod is a sluggish fish, feeding on the bottom of rivers, while the "trout" frequents the most rapid portions of the stream, and feeds near the surface. I have frequently observed them rising at flies and other insects in a manner similar to the English trout – hence the name it has acquired. The particular fish under notice is the largest I have seen caught on a rod, and its weight is probably due to the fish being full of spawn. These fish were introduced to the Yarra about 10 years ago, and many of them have been caught at all points between Melbourne and Healesville. I myself caught one of the same species about five years ago near Heidelberg, weighing 3½ lb. The markings of the cod are stripes on a greenish ground, while the trout is speckled on a blackish ground; besides this, the formation of the jaws of the two fish are distinctly different (*Argus,* 8 September 1898).

For many years scientists and anglers have wondered whether both species of cod had been introduced to the Yarra River and this news item provides the answer. Initial translocations of cod into the Yarra catchment had occurred from the King Parrot Creek in 1857 and the Murray River near Barmah in 1864. Major fish kills occurred in the Yarra during the early 1870s, decimating the cod population, and further translocations from the Murray River and Goulburn River near Seymour were undertaken to top up the population (Trueman, 2007). Any, and probably all, of these shipments of cod could have contained Trout cod and been responsible for their introduction.

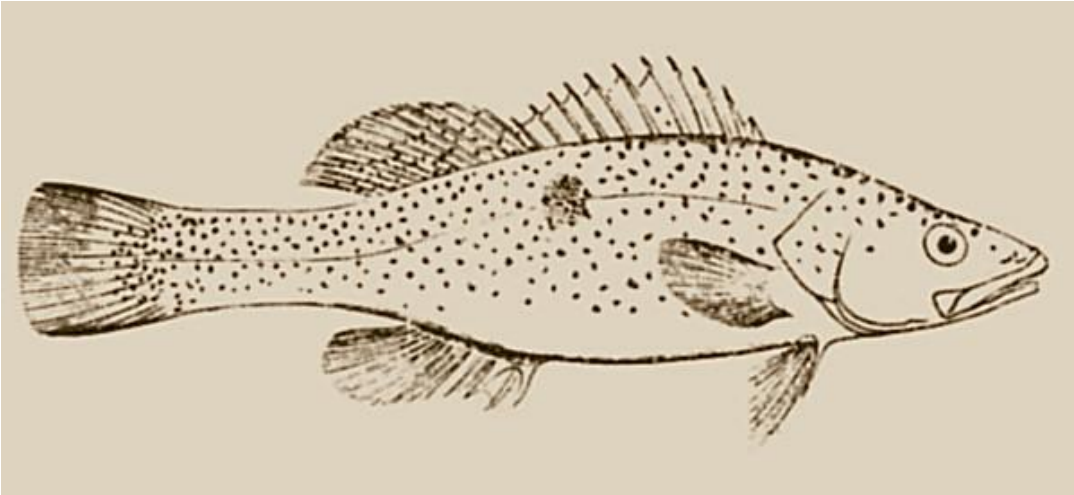
Photograph 5.2 Blandowski's Trout Cod





Above and Centre: Illustrations of *Gristes Macquariensis* (Fig.13. S) and *Gristes Peeli* (Fig. 14 J) published by Wilhelm Blandowski as part of Plate 133 in his work *Discoveries in Natural History on the Lower Murray,* 1858. Below: Photograph of the preserved skin of a Trout cod collected by Blandowski demonstrating that he was familiar with the species. All images reproduced with the permission of *Museum Victoria*.

Photograph 5.3 Gunther's Drawing of a Trout Cod

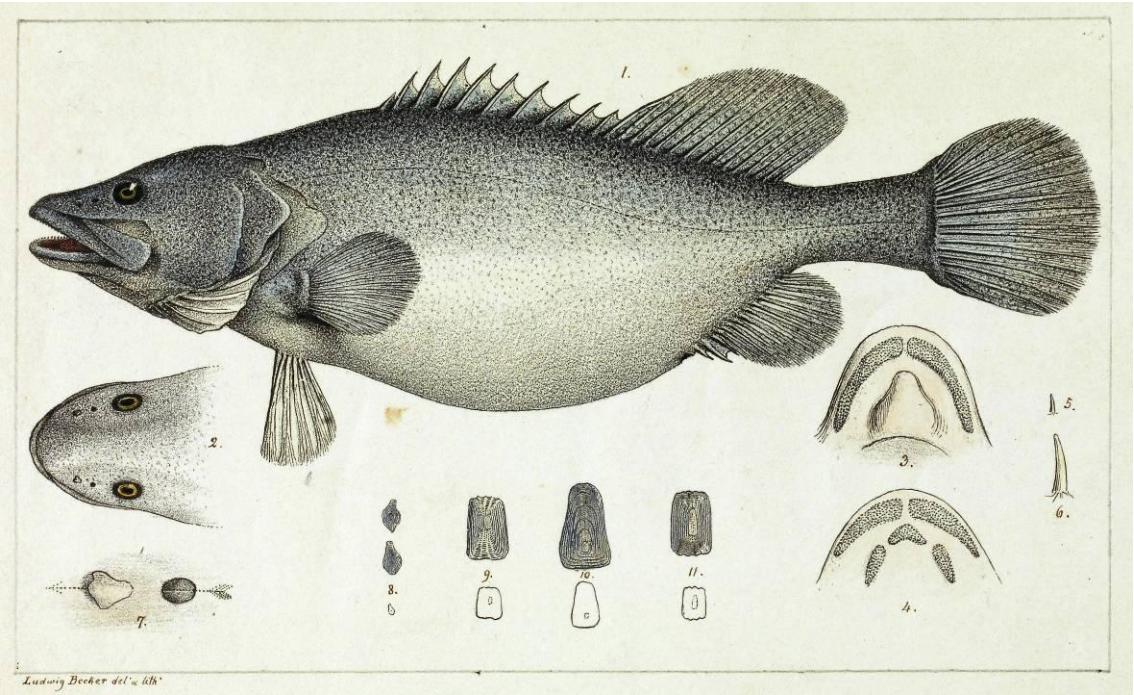


In 1880 Albert Gunther of the British Museum published *An Introduction to the Study of Fishes* which contained this illustration of the species *Oligorus macquariensis* the drawing of which, from the overhanging upper jaw, is clearly of a Trout cod (Gunther, 1880). It is apparent that many of the early specimens of cod forwarded to Europe were Trout cod and as a consequence this may in part have been responsible for the old world naturalists concluding that there was only one species. Image reproduced from the collection of the *National Library of Australia.*

Photograph 5.4 Castelnau's Trout Cod

In 1873 Francois de Castelnau published his description for a new species of cod which he named *Oligorus mitchelli.* The description was based on two specimens whose fate is unknown. Castelnau lodged this specimen of a Trout cod under the name *Oligorus mitchelli* with the *Museum National D'Histoire Naturelle* in Paris in 1877. Photograph by Claude Ferrara, copyright of the *Museum National D'Histoire Naturelle,* Paris.

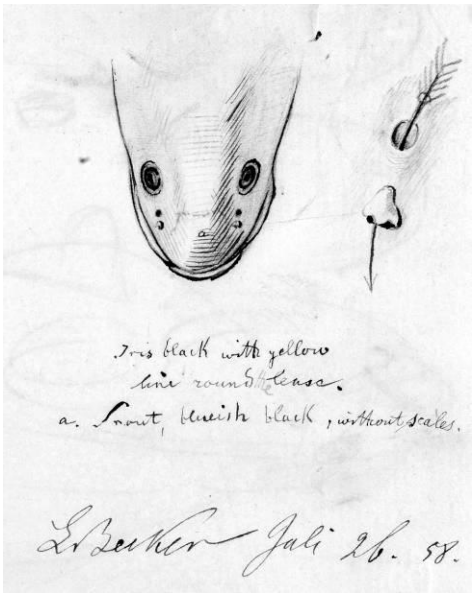
Photograph 5.5 Trout Cod or Murray Cod?

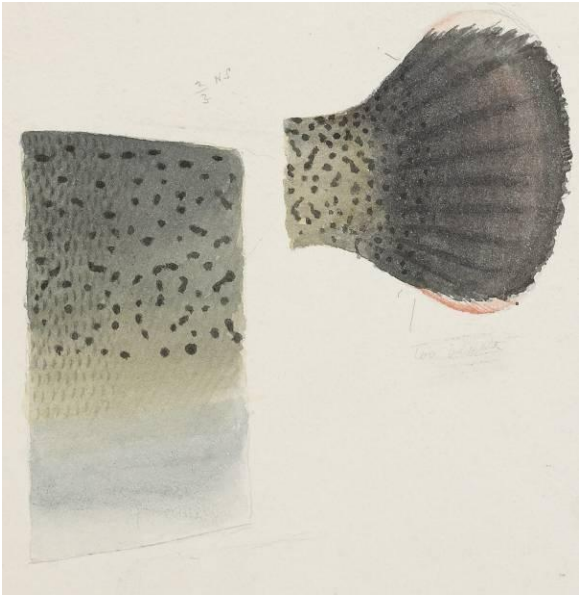


Original lithograph of a male cod, possibly a Trout cod, prepared by artist Ludwig Becker in 1858 who perished shortly afterwards on the Bourke and Wills expedition. The fish was reported to have been three feet four and a half inches in length. This illustration was subsequently used in the preparation of Plate 85 in Frederick McCoy's *Prodromus of the Natural History of Victoria*, 1884. Certain identification of the fish as a Trout cod is not possible with the mouth open though McCoy recorded that it was of the form of cod with a narrow pointed snout.

Reproduced with the permission of *Museum Victoria*

Photograph 5.6 An Artist's Work





Left: Handwritten annotations on artist Ludwig Becker's sketch of the head of a cod dated July 26, 1858 read 'Snout, blueish black, without scales'. The figure was ultimately used to prepare Plate 85 of Frederick McCoy's Prodromous of the Natural History of Victoria, published posthumously in 1884. This may be the earliest reference to what was to become a feature used by some anglers to distinguish a fish known as a 'bluenose' from the usual Murray cod.
Right: Part of a drawing dated May 16 1891 prepared by Arthur Bartholomew of features of a cod. Such drawings were undertaken to record detail necessary to illustrate a whole fish. The markings are clearly those of a Trout cod demonstrating beyond doubt that specimens of the species were handled by McCoy and his artists. The final illustration of the whole fish was never completed. Both illustrations reproduced with the permission of *Museum Victoria.*

Photograph 5.7 Oligorus gibbiceps

This deformed specimen of a Trout cod was captured from the Murrumbidgee River near Yass by Charles Jenkins in 1885. Sir William Macleay described it as a new species naming it *Oligorus gibbiceps.* Photograph copyright of the *Australian Museum.*

5.4 Renaissance Under Stead

David Stead was an Australian born scientist, passionate about the environment, who made major contributions to the study of natural history and its popularisation with the layperson. He was also a leading light in the genesis of the Australian conservation movement. As a member of the Linnaean Society of NSW, Stead acted as the consulting naturalist in a South Australian enquiry into the status of the Murray River fishery in 1900. He relied heavily on information provided by Samuel McIntosh, the Chief Inspector of Fisheries in South Australia, who interviewed many fishermen in order to collect evidence for the inquiry. In his report on the types of fish present in the Murray River he discussed the reported existence of a second type of cod:

> Throughout the evidence reference has here and there been made to "two kinds of cod." In most cases this has reference to those Murray cod living in the still waters of lakes and lagoons – particularly Lake Victoria in New South Wales and Lake Bonney, South Australia – as compared with those living in the rivers. / Now and again also a "rock cod" is mentioned. "it is not so numerous as the Murray cod and not so large (from 6 to 10 lb.)". Apparently, in appearance it is half-way between the Murray perch and the Murray cod, as some of those that have observed it fancied that it was "a cross between" those two species. It appears to be the name given to one of the varieties of Murray cod stated by Mr. M'Intosh to be Oligorus mitchelli (Stead, 1903).

It is apparent that Stead did not personally examine a 'rock cod' during his visit to South Australia in 1900. In his book *Edible Fishes of New South Wales* he made no mention of it (Stead, 1908). Confirmation of the identity of the fish as *Oligorus mitchelli* appears to have come from the honorary Director of the South Australian Museum Amandus Zeitz, acknowledged in a footnote to the text: 'It must be stated that the information supplied by Mr. M'Intosh was obtained from Mr. A. Zeitz F.L.S. to whom we are directly indebted' (Stead, 1903). It would appear that Zeitz had either seen examples of 'rock cod' or had been provided with a good account of what one looked like. Being familiar with Castlenau's 1873 description of *Oligorus mitchelli* it is clear that Zeitz had provided the identification for the 'rock cod'.

In 1902 the NSW Department of Fisheries hired Norwegian Harald Dannevig, a leading authority on marine fisheries and hatcheries, as Superintendent of Fisheries Investigations. David Stead, who joined the Department the previous year, acted as scientific assistant under Dannevig, though in many departmental publications he was referred to as 'the Naturalist'. Dannevig left the Fisheries Department in 1908 and Stead assumed much of his responsibilities in the research area, particularly with the inland fishery. Under Stead's stewardship research on many aspects of the biology of native fish commenced, including their migratory habitats and reproduction. This represented the birth of genuine scientific study of them. Experiments in the artificial propagation of native fish, initiated by Dannevig in 1905, were undertaken at Prospect Ponds near Sydney, and on the Murrumbidgee River, by Inland Fisheries Officer H. K. Anderson, assisted by professional fisherman W. J. Hill and physician Dr. H. O. Lethbridge, both of Narrandera. In addition extensive translocation of native fish and crustaceans was carried out. In early 1909 Henry Dawson, the Representative of Inland Fisheries travelled to Deniliquin to meet with local residents who had petitioned the government to end professional net fishing in the region. During his visit Dawson interviewed residents and fisherman, and generally investigated the state of the fishery. He subsequently submitted a report on his findings to the Chairman of the Fisheries Board. In his report Dawson described the purported existence by local fishermen of a type of fish unknown to him simply called 'trout': 'A fish called by the local anglers "Trout" is fairly plentiful. I have my doubts as to the identity of the latter, and have been promised that the fish shall be forwarded for identification' (NSW Fisheries Report, 1910). From his account it is obvious that Dawson during his visit never personally examined a 'trout'.

The following month Dawson travelled to Deniliquin to secure a specimen of the 'trout' and one of 17½ inches in length was obtained and forwarded to Stead. In 1929 Stead recounted how he suspected that a second, smaller species of cod existed based on specimens he received from anglers at Narrandera and Wagga, around 1905 (Stead, 1929b). Stead displayed the specimen at a meeting of the Fisheries Board. At that meeting Stead suggested naming it a 'trout cod' though the chairman indicated a better name could be found, with Dawson stating that an indigenous name would be better (*Sydney Morning Herald,* 23 November 1909).

Newspaper accounts of the time indicate that Stead's discovery generated considerable public interest, but also some controversy. At a meeting of the NSW Amateur Fishermen's Association the second cod species was discussed and clearly some members were already familiar with it: 'A good deal of angling interest is being shown in the capture of a new variety of Murray cod. Mr. R. Eastway informed the members of the Amateur Fishermen's Association on Thursday evening that Mr. John Gale, of Queanbeyan, had caught these fish many years ago in the Queanbeyan River' (*Sydney Morning Herald,* 27 November 1909). It was also reported that Stead considered naming the fish *Oligorus truttaceous* but the editor cautioned him as his opinion on the existence of the species differed from that of Ogilby, Gunther and others (*Sydney Morning Herald,* 9 December 1909; Stead, 1929b).

Stead recounted his discovery of Trout cod in the Annual Report for NSW Fisheries:

> The fish taken at Deniliquin in August, 1909, locally called "trout," which were similar to specimens already received from Narrandera and Wagga Wagga, as "Murray cod" has been found to be distinct from either of the species mentioned, and has been designated "trout cod." The Naturalist is of the opinion that in the trout cod has been discovered the long-lost "Oligorus mitchelli" of Castelnau, the very existence of which has been generally doubted (NSW Fisheries Report, 1914).

In October 1909 Stead and Dawson travelled to Deniliquin to oversee tagging experiments with native fish in the Edward River. No Trout cod were reported captured (NSW Fisheries Report, 1910). However, they subsequently toured the Murrumbidgee district as part of a delegation representing the Fisheries Board, collecting information on native fish and acquiring specimens. A footnote attached to a photograph of a Trout cod lodged in the NSW DPI Library at Cronulla records: 'It inhabits the Murrumbidgee River (and probably other western streams) and frequents running water'. During his sojourn on the Murrumbidgee a great deal of information was collected on Trout cod:

> In regard to size, the Naturalist inclines to the belief that the average female Murray cod becomes sexually mature and bears ripe eggs at a length of from 18 to 19 inches, and of a weight of a little over 2 lb., and that the average length of trout cod at maturity is 10 inches, with a weight of about 6 oz.; / Dixon's dam was visited by the Naturalist, the late Chairman of the Fisheries Board, and the Inland Commissioner, and it was found that it was heavily stocked with Murray cod and other native fishes, and that trout cod is as abundant in the Murrumbidgee as is the Murray cod (NSW Fisheries Report, 1910).

One location which Stead visited was Narrandera and in correspondence with the Narrandera Anglers Club, published in the local newspaper, he demonstrated his enthusiasm for the fish:

> Mr. Stead writes that the trout-cod, now prevalent in the Murrumbidgee, is a species absolutely distinct from the Murray cod; nor is it, as its name would seem to imply, a cross between the trout and cod, for it has absolutely nothing in common with the trout of the genus Salmo. The trout-cod is really a species of perch, and Mr. Stead is enthusiastic as to its value, both as a table fish and affording good angling (*Narrandera Argus*, 11 January 1910).

The ‘discovery’ of ‘trout cod’ heralded the arrival of a golden era of work on the species. The period from WW1 until well into the depression years, in hindsight, can be viewed as the only period during which extensive investigation into the biology of Trout cod occurred, while it remained abundant in some of its former habitat, albeit often as an adjunct to research on Murray cod. Most of the surviving museum specimens of Trout cod were collected by Stead and his associates during this period. Live Trout cod were collected and held at the government trout hatchery at Prospect Ponds for quite a number of years but failed to reproduce. A scheme termed ‘utilization of nature’s waste’ was employed whereby fish, including Trout cod, were captured from drying-up waterholes adjacent to the Murrumbidgee River and conveyed to permanent waters. Translocations from the Murrumbidgee itself to other waterways also took place. Target waters for these translocation activities included Cataract Reservoir and the Nepean River near Sydney, and the newly constructed Burrinjuck Dam on the Murrumbidgee River (NSW Fisheries Reports, 1914).

Around the time that Stead made his ‘discovery’, a correspondent to the *Argus* newspaper of April 5, 1910, identified as “M.St.B.” of Foster, posed the question of two types of cod to distinguished journalist Donald Macdonald. He wrote:

> Can you tell me if the name Murray cod includes all cod found in our freshwaters, because the blacks insisted upon two different kinds, name Parnthall and Gnomell, and would name a fish, one or the other, at a glance. As a boy I always recognised them as different fish, and still pick them out in fish-shop windows? (*Argus*, 5 April, 1910).

Macdonald was a keen naturalist and angler who regularly corresponded with readers in columns of the *Argus* entitled *Nature Notes and Queries* and *Notes for Boys.* In 1887 he had published *Gum Boughs and Wattle Blooms*, a book recording stories of life in the bush including a whole chapter devoted to the pleasures of fishing for Blackfish. M.St.B’s recollections of indigenous names for two species of cod corresponds with those recorded by Luise Hercus as used in the Wemba Wemba language of the Swan Hill region being *Pandyil* for the Murray cod and *Ngumel* for the ‘Murray trout’, ie., Trout cod (Hercus, 1992). Macdonald, referring to Frederick McCoy’s work, advised that there was only one species, with the two forms representing sexual differences. M.St.B’s letter was to initiate ongoing correspondance with readers on the Trout cod which continued until Macdonald’s death in 1932. Today these articles provide valuable records on the past distribution and habits of Trout cod.

Mr. R. W. Harvie of Kerang enquired of Macdonald about a fish occasionally caught in that area and Mildura called a Murray trout which had different markings to the Murray cod (*Argus*, March 3, 1911). Two weeks later the chief inspector of fisheries for Victoria, Major Semmens, provided a detailed response:

> the fish described by Mr. Harvie is identical with what D. H. Stead calls a ‘trout cod’. The fish has been brought under Mr. Stead’s notice in recent years, but has been known to many northern Victorian anglers as a Murray trout for a great number of years. It is a much smaller fish than the Murray cod, and, instead of being mottled like the latter, is spotted, though many of the spots are confluent. I have been looking out for a specimen for some time to get it scientifically examined as to whether it really is a distinct species from the Murray cod (*Argus,* 17 March 1911).

In the same column Mr. W. Wilson of Castlemaine reported catching dozens of Murray trout in the Coliban River.

Over the ensuing years a number of correspondents wrote of the Murray trout, but the most notable was fisherman J. H. Jarman of Narrandera who had worked closely with Stead. Responding in 1917 to a published letter on a small cod species in the Violet Town area, Jarman detailed contemporary tagging work on Trout cod, and provided additional information on Trout cod and other native fish at intervals up to Macdonald's passing.

Jarman outlined his knowledge of Trout cod:

> The cod alluded to, if they are cod, is what D. G. Stead has named trout cod, an entirely distinct species, and much smaller than the Murray cod. They mature and will spawn as small as 4oz., though they may then be three years old, and a fish of 8lb. or 10lb. is a giant, the female always the largest. To the casual observer they are much like the Murray cod, but are readily distinguished by an expert. They have a dark mark along the cheek through the eye. The jaw is undershot, the spots are dark and irregular in shape, and the back is dark in colour, while the Murray cod is brown on the back, with shiny bronze mottles (not spots) on the sides, these merging into each other. In the Murray cod the jaw is not undershot. The trout cod is never found out of a running stream, and is voracious and snappy after bait, while the Murray cod, either in lagoons or elsewhere, takes the bait more deliberately. He grows much faster, and does not spawn at less than 1½lb. weight or more. The experience on the Murrumbidgee is that cod spawn from July to December, seldom later. In fact they are spawning now. The closed season fixed by Stead is October and November. Some five years ago Mr. Stead and myself and others caught and released a number of both kinds of cod after they had been tagged with silver numbers and a register kept. One fish of 7¼lb. was caught 10 weeks later in the same locality, and was then 8½lb. Other tagged fish were caught later, but their weights and measurements were unfortunately not recorded. The fish mentioned by 'M.C.G.' of Violet Town are assuredly not less than 18 months or two years old (*Argus,* 20 July 1917).

Jarman forwarded a specimen of a Trout cod to Macdonald who wrote in the *Argus* on March 8 1918 that 'I can speak without any doubt as to its table qualities'. In 1920 he received more information from Jarman on Trout cod:

> Some interesting points in connection with the habits of Murray fishes were mentioned by Mr. J. H. Jarman of Narrandera, in recent conversation. While the trout cod, recognised in his locality as a distinct variety of sub-species of the Murray cod, and always commanding high prices from those who know its merit as a table fish are fairly common in the Murrumbidgee, he cannot find that it exists in the western rivers such as the Lachlan and the Darling (*Argus*, 1 October 1920).

Macdonald's final correspondence on Trout cod appeared in 1932 and was received from retired commercial fisherman R. J. Larsen:

> Murray trout and cod. In spite of scientific opinion Mr. R. J. Larsen of Elsternwick is not prepared to accept that Murray cod and trout are the one species with only sexual differences, though he has, he says, not the biological training that would justify a positive statement. He has, however, caught and cleaned tons of Murray cod, and could discern differences in shape and colour markings that were due to sex. The markings differ in localities, and the condition is largely dependent upon the cleaness of the water. The trout markings are, however, constant wherever the fish is taken. The cod, as we know, runs to great weights, but the largest Murray trout Mr. Larsen got was only 10lb., the largest he ever heard of 13lb. and it is not unusual for anglers or fisherman to underestimate the weight of their fish. Other Indicators. In cleaning such quantities of Murray cod for market Mr. Larsen is familiar with their internal appearance at different periods of the year. Cod of both sexes show rolls of fat, which gradually disappear as spawning time approaches: the trout has no sign of this fat

at any time. In cod the eggs are small at maturity about the size of a grain of sago – while trout ovaries are more rounded, of bigger shape and the eggs much larger. The head of the trout is, he says, more pyramidal in outline, the underfins larger, and the body more evenly tapered to the tail than with cod, while there is a distinct difference in the flavour of the two fish when caught from the same waters. Use of the Tether. Mr Larsen mentions another peculiar difference between Murray cod and trout which recalls the old time ways of Murray fishermen or "Murray whalers" in tethering their spare cod in the bank to keep them alive until they are needed. If cod and trout of the same size are tethered and a big wandering cod comes along he will invariably tackle the trout first. Mr. Larsen has put it to the test by tethering alternately two or three trout with the same number of cod and often found all the trout had been attacked, but not one cod (*Argus,* 12 February 1932).

Photograph 5.8 The First Photograph

David Stead included this photograph of a Trout cod in a feature news article in the *Sydney Mail* in 1929, in the *Australian Geographer* in 1932 and the following year in his book *Giants and Pygmies of the Deep.* It was the first photograph of the species ever published. The original survives in the NSW DPI Library at Cronulla. A caption attached to the photo states: 'TROUT COD (*Oligorus mitchelli*) Grows to a weight of about 14 lbs and is equal to the Murray cod in the excellence of its flesh. It inhabits the Murrumbidgee River (and possibly other western streams) and frequents running water*'.* Photo reproduced with the permission of the *NSW Department of Primary Industries*.

Photograph 5.9 Whitley's Trout cod

Gilbert Whitley in his 1937 paper noted that in one specimen of a Trout cod he examined at the Australian Museum the jaws were equal in length. This specimen, which survives in the museum's collection, is likely to be the one referred to by Whitley. When the mouth is closed the jaws close almost perfectly though the lack of an overhanging upper jaw may have been the product of shrinkage during preservation. Photo copyright of the *Australian Museum*.

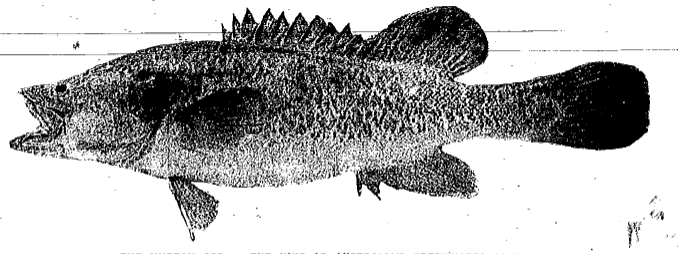
Photograph 5.10 A Feature Article on a Mythical Fish

Murray Cod and Trout Cod

By David G. Stead

For many years there have been the most lively discussions among anglers and residents of our western rivers system concerning the identity of the various fishes of their waters. But none has attracted such attention as the Murray Cod and its close cousin the Trout Cod. In the following notes Mr. Stead describes and illustrates the two species, and gives some valuable information concerning each of these fine food-fishes.

IN the year 1902 I began a series of official investigations into the distribution and spawning habits of our edible fishes. Apart from its general utility and interest in the prosecution of fisheries work, this had an immediate application in the making of fisheries regulations—especially relating to lawful sizes, close seasons, and so on. Immediate attention was bestowed, naturally, upon our marine fishes, partly because these were of paramount importance and because there were greater facilities for the capture and study of coastal collections. In the process of elucidating spawning times, rate of growth, occurrence of young fry, nature of eggs and productivity, food and feeding habits, etc., many thousands of commercial fishes (and others) were



THE MURRAY COD — THE KING OF AUSTRALIA'S FRESHWATER FISHES
Attains a weight of 100lb. Found in all western rivers, lagoons, and billabongs of South Queensland, New South Wales, and Victoria, and in the upper waters of Clarence River.

handled, measured, weighed, and examined. While this was going on there was quite a considerable agitation in our freshwater fisheries as to the lawful sizes of the principal fishes, suggested prohibition of certain forms of fishing gear, closed areas, and close seasons. Naturally, this agitation centred chiefly round the king of Australia's freshwater fishes—the Murray Cod, which may be justly claimed to be one of the best of the world's food fishes.

Discovery of Trout Cod

PRELIMINARY investigations which had been made into the Murray Cod indicated that it attained a fairly large size before spawning; so the lawful size at which it might be captured was fixed accordingly. The public is wont to fix its own sizes, however, and these are based upon one consideration only—is it of a size worthy of individual cookery? This is a far more important factor than might be imagined, and in some sea species must be taken into account. Added to the clamour at the time were the voices of those who asserted that the Murray Cod spawned at as low a weight as half a pound! No notice of this was taken at the time, as one was quite used to the wildest assertions of those who created "fish stories" for their own benefit; but when some worthy anglers in 1905 made the statement that at Narrandera, on the Murrumbidgee River, they had often seen Murray Cod of this small size "full-roed," I sent away to them at once and invited them to prove their assertion by sending in some examples. In due course two fishes arrived, weighing respectively eight and nine ounces, which both contained roe in a well-advanced state of development. An examination of the fishes showed that if they were to be classed as ordinary Murray Cod they diverged a good deal from the ordinary types as known from many parts of the western river system. Further, the eggs (nearly ripe) were decidedly smaller than those of the Murray Cod that I had examined, and which ran into many thousands. I then put them aside as probably belonging to a distinct species of fish not hitherto recorded. Later on further examples of the same form were obtained from Wagga (sent in as Murray Cod, of course); but though I saw that they were identical with the Narrandera specimens, I was loath to go so far as to say that they represented a new species, without first seeing the fish and its mode of occurrence in the natural state.

During August of 1909 my late friend Henry Dawson (of the old Monaro family) paid a visit to Deniliquin, and while there heard the fishermen frequently refer to a fish that they called "trout." Doubting the existence of any true trout there, he arranged for a specimen of about 17½ inches in length to be sent to me, when it proved to be of the same kind as the Narrandera and Wagga Wagga specimens. The Board of Fisheries then instructed me to investigate the matter. This I did very closely during 1909 and 1910 in many parts of the western river system, from the Barwon to the Murray and the lower Darling. One result of these intensive investigations was that it was established beyond a doubt that here was an entirely distinct species of fish, of a much smaller size than the Murray Cod, and possessed of quite distinctive physical features, colour, and habits. It was ascertained further that this "trout cod," as I named it at the time, did actually become sexually mature at about half a pound weight (or even a little under), while the Murray Cod did not spawn below a weight of about two and a half pounds.

It is worthy of mention that the information obtained during these investigations formed the basis for all subsequent regulations by the Fisheries Department relating to close seasons and lawful size of capture.

Trout Cod and Murray Cod Compared

THERE are certain well-defined characters which render the two species quite easy of determination even by the tyro. One prominent feature of the Trout Cod is the bold snout, not so excavate or shovel-nosed as in the Murray Cod, and which, in the former, overhangs or protrudes beyond the lower jaw, while in the Murray Cod the reverse is found—the lower jaw protruding beyond the upper, and this, coupled with the excavate snout, giving to the larger fish that familiar flattened shovel-nosed head. In the field the two kinds are very distinct, and the wonder is to me that anglers did not themselves point out the differences long before. To many of the professional fishermen the Trout Cod had been known for many years, and distinguished as "trout" or (on the lower Murray) as "rock cod." The name trout was applied to this fish, no doubt, on account of the spotted sides and more elegant appearance. In the Murray Cod the sides are always more or less marbled rather than spotted, whereas in the Trout Cod the sides are always quite distinctly spotted. The spots may be round (and either fairly widely separated or close together) or else they may be oval, oblong-oval, or confluent. When the fish is lying in the water alive a dark stripe on each side, running from the point of the snout to the eye and continued across the gill-cover, is very prominent. In addition to the differences of snout and jaw, the eyes of the Trout Cod are larger than those of the Murray Cod, and the sides of the head are more flattened. The former fish is also much higher in the body and more perch-like than the latter. In the spawning period it is at once noted by the angler that whereas the young Cod, say, under a pound weight, show no development of the roes whatever, the young Trout Cod from half a pound upwards have the eggs and the milt (soft roe) fully developed.

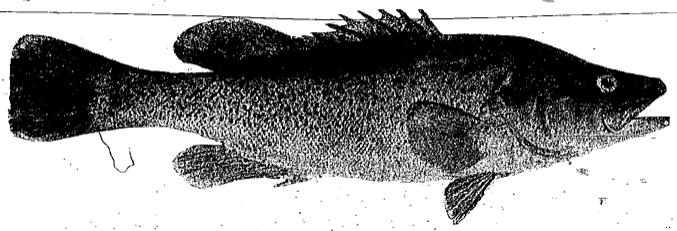
Another important difference noted by me in these two species is as regards their mode of occurrence in the rivers and billabongs. One seldom encounters the Trout Cod in the latter, although the Murray Cod are almost at their best in such still waters. The Trout Cod loves moving waters, and is most commonly found in the vicinity of river bends or "racecourses." Here against a fairly deep bank, is the best spot to try for a Trout Cod if fishing with hook and line. When hooked the fish puts up quite a fair fight, altogether different from the comparative sluggishness of the Murray Cod, so well known to river anglers.

I mentioned that the eggs of the Trout Cod were smaller than those of the Murray Cod. The ripe eggs of the latter are usually from about a tenth to an eighth of an inch in diameter—quite large for a member of the perch family; but the eggs of riverine fishes are larger than those of their sea relatives. Still, they are fairly prolific. One six-pound Murray Cod that I actually counted the eggs of had no less than 16,343 in the two branches of the roe.

Trout Cod a Long-Lost Fish

AFTER having definitely determined that the Trout Cod was a distinct species I came to the conclusion that it was quite new to science. Its nearest relative, the Murray Cod, is known as *Oligorus macquariensis*. I intended, on account of the spotted skin and more elegant form, to call the Trout Cod *Oligorus truttaceus* (trout-like). But on looking through Australian ichthyological literature I found a description—a very imperfect one—of a fish discovered about 38 years before by Count Castelnau (then in Melbourne) among a consignment of fresh fish from the Murray River, and which he had named *Oligorus mitchelli*. This seemed to be my new fish. I then found that there was a fish under this name in the old collection at the Macleay Museum at Sydney University. Upon examining it, sure enough it was my fish. Mr. George Masters, the veteran naturalist, who was then in charge, and who had been very closely connected with Sir William Macleay—whom I may call the father of Australian ichthyology, as he was the father of general science in so many ways—told me that he had no doubt that the label had been put on the fish after consultation between Sir William and Count Castelnau. In the same collection I found a specimen of the same fish with a dwarfed snout, which Sir William had erroneously thought to be a distinct species and had named it *Oligorus gibbiceps*. Apparently he did not know that we get these pug-faced specimens in many kinds of fish. I have had them frequently, especially among young fish—trout, whiting, mullet, etc. In these cases the snout drops almost sheer away from the front of the eyes.

Thus a long-lost fish came to light again, and, with the facts at my disposal, *Oligorus mitchelli*, the Trout Cod, was not only reinstated, so to speak, but a mystery (and a source of great confusion in fisheries administration) was elucidated. Regulations are now made independently for each species—the Trout Cod and the Murray Cod—and one important cause of dissatisfaction and agitation among Riverina anglers has been removed.



THE TROUT COD OF THE WESTERN RIVERS OF N.S.W.
This fish grows to about 15lb or 20lb in weight.

Under the name of Rock Cod the Trout Cod is very well known, and is quite abundant, on the lower Murray from Wentworth well down into South Australia. Some fishermen think it is a cross between the Murray Cod and the yellow-belly, or golden perch; but there is not the slightest foundation for such an idea. Anyway, all over the world this is quite a pet idea among many fisherfolk to imagine that nearly allied kinds of fish are hybrids. The fish is more often seen in the Melbourne market than in Sydney.

My illustrations give a very good idea of the different appearance of two specimens—one of the Trout Cod and the other of the ordinary Murray Cod—of about the one size. But the first-mentioned was a mature fish that had spawned probably two or three years in succession, while the second was an immature Cod. Whereas the Murray Cod may reach one hundred pounds in weight (or even more), a Trout Cod of fifteen to twenty pounds is quite a large one, and five pounds would be nearer to the normal size of large specimens.

Spawning of Murray Cod

ONE of the most frequently asked questions relates to the spawning of the Murray Cod. The principal spawning time is during October and November; but at any time during the warmer months, if a long-continued rise in the river takes place, a certain amount of spawning occurs. The eggs are deposited principally in backwaters and billabongs. Under normal conditions of temperature the eggs, which are attached to submerged objects, hatch out in about seven or eight days. The young Cod immediately seek cover under friendly sticks or sunken leaves.

In the 27 November 1929 edition of the *Sydney Mail* David Stead published this lengthy feature article on the discovery and biology of Trout cod. Despite citing key differences between the two cod species including their reproduction his claim of two cod species was ignored by many of his peers.

5.5 Return to Obscurity

While some of Stead's contemporaries accepted his view on the Trout cod, others questioned his recognition of the species or were at least uncertain. Howard Joseland (1921) in his angling guide makes passing reference to Stead and Trout cod: 'The Trout Cod Mr. Stead places as a species distinct from the Murray cod. It is a handsome fish resembling a well-grown Leven trout in colour, but heavier in build'. That there was ongoing debate on the existence of two cod species was revealed by Waite (1923) who posed the question 'What, for example, is the status of the "trout cod"?' Allan McCulloch began his association with the Australian Museum in a voluntary capacity as a 13 year old in 1898 and by 1906 was in charge of the vertebrate collection at the museum. In 1922 he published his *Australian Zoological Handbook No 1* and in the section describing the Murray cod he discussed Trout cod: 'It varies considerably in form and colour-marking, and one variety with trout-like markings and an overhanging upper jaw has been regarded as a distinct species under the name of Trout Cod, Oligorus mitchelli Castelnau' (McCulloch, 1922). It appears that McCulloch was uncertain as to the status of Trout cod.

After leaving NSW State Fisheries Stead apparently sensed that some of his peers did not accept the existence of Trout cod as a separate species. He continued to promote Trout cod, and 1929 wrote a very large feature article in the *Sydney Mail*. He provided much background on the discovery of Trout cod, the common names used for it by fishermen, described in detail the physical differences between the two cod species, its habitat preferences and behaviour, and differences in the reproductive biology of Trout cod compared to Murray cod and included photographs of both species (Stead, 1929b). In 1932 he published another shorter article on Trout cod in the *Australian Geographer* (Stead, 1932) and the following year in his book *Giants and Pygmies of the Deep* further discussed the species (Stead, 1933).

Gilbert Whitley joined the Australian Museum in 1922 and succeeded McCulloch after his death in 1925 as ichthyologist. In 1929 he identified the fact that the genus *Oligorus* given to the Murray cod by Gunther in 1859 had in fact previously been allocated to a North American beetle and was therefore preoccupied. As a consequence he erected the genus *Maccullochella* for the Murray cod to honour his mentor and late friend Allan MacCulloch (Whitley, 1929). Whitley turned his attention to the existence of Trout cod. It is not known what stimulated his interest, most probably a request from the NSW Chief Secretary's Department to create a bibliography for the Murray cod. In his review of the literature he quoted observations made by Stead and H. K. Anderson regarding aspects of the reproductive biology of the Trout cod citing manuscripts he possessed. In the text Whitley stated:

> I am unable to recognize more than one species of Murray Cod / I have examined all the Murray Cod in the Australian Museum from Benalla, Victoria; Mary R., Queensland; Richmond River, Wellington, Murrumbidgee and many other New South Wales localities, also the Murray River, and cannot find valid criteria for specific separation. / The snout overhangs the lower jaw in most specimens but in one the jaws are equal, and, as the fish grows, the lower jaw projects more and more. The spotted sides of the Trout Cod do not differ from those of a large Murray Cod and it is evident that the latter is merely the adult form of the young or Trout Cod stage; it is remarkable that we have no young Murray Cod without the trout cod characteristics (Whitley, 1937).

Whitley, like Ogilby, correctly identified that the Bathurst holotype had the characteristics of a Trout cod. He concluded:

> If it be later found necessary to distinguish the two nominal forms, the custom of some Palaearctic ichthyologists might be followed and the Trout Cod known as Maccullochella macquariensis forma

> macquariensis and the Murray Cod as Maccullochella macquariensis forma peeli, this name having been given to a specimen with marbled coloration and a projecting lower jaw by Major Mitchell in 1839 (Whitley, 1937).

In a footnote in his bibliography to the reference for Castelnau he added 'The Murray Cod has been described several times as a "new" species but modern authorities do not consider that there is more than one, somewhat variable species' (Whitley, 1937). Whitley faced a number of problems that may have led him to his decision. He clearly was influenced by the large number of small Trout cod held in the museum collection, many of which had been collected by David Stead and his associates. By Whitley's time some of the Museum's collection had been exchanged with other institutions, was in poor condition or had been destroyed. At least one Trout cod specimen did have jaws of nearly equal length though probably produced as a distortion through preservation (Author's pers. obs.) and in larger specimens of Murray cod the markings tend to be spotted.

By Whitley's time, the species concept had evolved from that understood by nineteenth century taxonomists. Subsequent to the publication of Charles Darwin's *Origin of Species* in 1859, which highlighted the importance of variation and the relatedness of organisms, there was much debate about the definition of species. This ultimately led to the creation of the biological species concept, invoking reproductive isolation, formalised by Ernst Mayer (Mayer, 1942), though even today in the vast majority of cases, species are separated on the basis of physical or DNA differences rather than a consideration of their reproductive biology. Although the biological species concept had not yet been formalised, the biologists of Whitley's time did have an understanding that reproductive differences were important in discriminating between similar species, according to the concepts of natural selection elucidated by Darwin. Although aware of, and quoting, the reproductive differences between the two types of cod reported by Stead and Anderson, Whitley drew his conclusion on the basis of museum specimens, ignoring advice from those that worked with the living animal like Anderson. His suggestion that the possibility of further evidence could change his view on the existence of two types of cod could have been obtained through an attempt at the collection of juveniles of the Murray cod form. The action of his paper, combined with the disappearance of Trout cod from much of its former range at that time, can be identified as a major source of the confusion as to the existence and status of the fish that persisted for the following three decades.

Whitley's influence on contemporary biologists was considerable. The following year William Dakin and Geoffrey Kesteven, in their report on the artificial propagation of the Murray cod at Bringagee on the Murrumbidgee River, cited Whitley and concluded that Trout cod were a migrating variant of the Murray cod. Their view may have been coloured by their stated opinion that Stead had impeded the development of hatchery techniques for native fish with his translocation activities. With respect to Trout cod Dakin and Kesteven made the following observations:

> Certainly colour variations are present – possibly due to habits associated with the breeding season. Thus two distinct colour varieties were brought before our notice in the course of the work to be described – they were spoken of as local and traveling fish, the former had apparently "normal" characteristic marking on a greenish background, whilst the latter were grey and the markings much less distinct (Dakin & Kesteven, 1938).

Others were clearly less certain about Whitley's conclusion. Ian Munro in his *Handbook of Australian Fishes* accurately described Trout cod as 'A bluish or white colour variety with spotted sides and a dark stripe along the head, and a projecting upper jaw is sometimes recognized as a distinct species known as the Trout Cod, M. mitchelli (Castlenau 1873)' (Munro, 1938). John Tubb from 1936 to 1938 was Fisheries Adviser to the Victorian Fresh Water Research Committee and during this period investigated the Barmah Lakes fishery. During his field

study Tubb recorded differences in the spawning season of the two types of cod, attempted the artificial propagation of Trout cod, and clearly recognised them to be different from Murray cod (Cadwallader, 1977).

5.6 Resolution

With a significant decline in the inland commercial fishery apparent by the end of the Second World War, the then Victorian Fisheries and Game Department, with the support of the NSW Fisheries Department, initiated a survey to report on its status. From 1949 to 1952 John Langtry collected data on the distribution, abundance and biology of the major fish species, including Trout cod. Not only did he undertake netting surveys at intervals along the Murray River, Langtry interviewed professional and amateur fishermen recording their observations and thoughts. Significantly he interviewed William Hill and Dr. H. O. Lethbridge, both in their twilight years and pioneers in the artificial propagation of native fish, recording their recollections, and utilized the work of his predecessor John Tubb. From all these information sources and from his own personal observations, Langtry listed in detail the key physical and reproductive differences between Murray cod and Trout cod, as well as providing descriptive and numerical data on the distribution and abundance of both species. Langtry ultimately concluded 'It is considered that Murray cod and trout cod are different: if not as distinct species then certainly as races of the same species' (Langtry, 1960). Limited copies of Langtry's report were not circulated until 1960 and it was not freely available until 1977 (Cadwallader, 1977). The delay in preparation of the report and the failure to disseminate this information at the time was an opportunity lost, not only to clarify the taxonomic status of Trout cod, but to take affirmative action to conserve the species while some significant populations were still extant. Dr. Philip Cadwallader who edited Langtry's manuscript in 1977 reflected on the opportunity that had been missed: 'It is a sad reflection on freshwater fisheries research in Australia during the last 25 years that much of the research suggested by Langtry has not yet been conducted. His suggestions for preventing the decline of native fish stocks have largely gone unheeded' (Cadwallader, 1977).

During the 1950s other authors suggested that there were two distinct species of cod. Theodore Roughley, Superintendent of NSW State Fisheries, pointed out that fishermen and taxonomists held opposing views on the existence of Trout cod as a separate cod species and cited evidence of blood serum tests conducted in the United States suggesting that there were two species. He discussed a number of aspects of the biology of Trout cod and suggested that it was probably a distinct species (Roughley, 1955). In 1959 John Lake, the Inland Fisheries Biologist for the NSW State Fisheries Department, prepared a document summarizing what was considered reliable information on the biology of all the freshwater fish species found in NSW as a prelude to an extensive research program (Lake, 1959). He had previously conducted research on the trout fishery and, coincidentally, was related to the first European to encounter a cod, George Evans. In this work he speculated on the existence of two types of cod:

> It varies considerably in form and colour pattern and it is possible that two species exist. One colour variety has an overhanging upper jaw and most pyloric caecae are much smaller and sometimes fewer in number. It has been regarded by some people as a distinct species under the name of trout cod. It is reputed to spawn mainly in September, spawn at a smaller size, and has larger and brighter coloured eggs. Colour variations are not very significant since they occur in most species and vary according to habitat, age, and habits such as those associated with the breeding season. It will be considered here as one species. Further work may, in the future, prove otherwise (Lake, 1959).

Lake did not specify where he had sourced the observations discussed, though the reproductive details suggest it may have been the manuscript prepared by H. K. Anderson cited by Whitley.

In 1962 NSW State Fisheries opened the Inland Fisheries Research Station on the banks of the Murrumbidgee River near Narrandera, with the purpose of researching the biology of native fish and developing techniques for their artificial propagation. A previous attempt at establishing a native fish hatchery at Burrinjuck Dam in the late 1920s had been abandoned after damage by floods, an inability to procure mature broodstock and the onset of the Great Depression. Lake was appointed biologist in charge commencing research activities during the construction phase in 1960. In his endeavours he relied heavily on the pioneering work of Hill, Lethbridge, Anderson, Tubb and Langtry and forged a close alliance with professional fisherman William Davies of Swan Hill whose practical insight into the fish proved invaluable. Davies assisted in the collection of broodstock and their maintenance in ponds as well as supplying family photographs subsequently used in publications by the department and its staff. Research into the basic biology of all of the larger native fish species of the basin was carried out, with attempts at stimulating spawning in ponds of the Murray cod, Golden perch, Silver perch and Catfish were ultimately successful. In April 1962 a large Trout cod was captured from the Murray River in the Yarrawonga region a photograph of which was used in a number of publications (Lake, 1967; 1971). It is clear that by 1967 Lake had handled live Trout cod and by this time had developed a firm position on their status: 'There is not sufficient evidence to definitely separate this fish, as a distinct species from the Murray cod. From the evidence seen by this Author it is strongly suspected that two species do exist. Further work is required however' (Lake, 1967). Lake went on to list the many physical differences he observed between the two species of cod as well as observations on their handling characteristics gleaned at the Narrandera facility. In a footnote to an addendum Lake made his thoughts on the status of Trout cod quite clear: 'The trout cod is almost certainly a distinct species' (Lake, 1967).

Langtry's manuscript, along with Lake's recommendation for further work, did initiate some action on the case of Trout cod. The head of the Victorian Fisheries and Game Department, Alfred Dunbavin Butcher, in 1959-60 organized the collection of specimens of cod from Lake Sambell, near Beechworth and the Seven Creeks, near Euroa, both locations being cited by Langtry, which were subsequently lodged in museum collections. In particular, local newspaper accounts from the mid 1960s indicate that the Department showed considerable interest in the management of the Lake Sambell cod fishery. Butcher himself published a paper making reference to Trout cod, including observations sourced, it is believed, of specimens obtained from the Seven Creeks (Butcher, 1967; Barney Kipping, pers. comm.). Ultimately he provided the impetus for the resolution of the existence of the two species of cod. Correspondence between Professor Allan Weatherly of the Australian National University and Dr. Tim Berra of Ohio State University in 1967 ultimately led to an investigation into the existence of two cod species being carried out during 1969 and 1970. They located and reviewed the early writings of the naturalists and examined museum and living specimens of cod sourced from a wide range of locations. From their reading of the literature, penned by previous workers going back well over a century, they knew what they were looking for. It was no coincidence that these two researchers concentrated their efforts on Lake Sambell and Seven Creeks as Langtry had provided these locations with pinpoint accuracy as the key to answering their questions. Using physical characteristics of living and museum specimens, combined with electrophoretic data, the two species of cod were separated as the Murray cod utilizing Mitchell's *peeli,* and Trout cod utilizing Cuvier's *macquariensis.* Their description for Trout cod was strikingly similar to those of Cuvier in 1829 and Castelnau in 1873 (Berra & Weatherly, 1972; Berra, 1974). It was only with the publication of their work that there was general acceptance within the scientific community of the existence of two species of cod in the Murray-Darling Basin.

Since 1972 additional studies of Trout cod, including detailed electrophoretic and genetic analysis, as well as knowledge gained about the reproductive biology from hatchery production, have supported its status as a species distinct to Murray cod (MacDonald, 1978; Jerry *et al.,* 2001; Bearlin & Tikel, 2003). Ironically most of the distinguishing characteristics between the two species, save for those uncovered by the modern

development of electrophoresis and DNA characterisation, was certainly known by the third decade of the twentieth century and much of it in the late nineteenth century. David Stead's detailed account published in 1929 outlining key physical and reproductive differences between the two types of cod (Stead, 1929b) should have been accepted at that time as indicating that two species existed.

Additional species of *Maccullochella* have also been identified in some coastal streams outside of the Murray-Darling Basin. These include the Eastern Freshwater Cod (*Maccullochella ikei*) of the Clarence River system, the Mary River cod in southern Queensland (*Maccullochella mariensis*) and at least three of unknown status which have become extinct since European settlement in the Richmond, Logan and Brisbane River systems (Rowland, 1993; Nock *et al*., 2010). A detailed account written by angler D. Donovan suggests cod were also present in the tributaries of the Burnett River system (*Brisbane Courier,* 17 September 1879). This is supported by a latter news account reporting the capture of two specimens in the Degilbo Creek near Biggenden and their abundance in the 'southern watershed' of the catchment (*Brisbane Courier,* 7 October 1902). Recent mitochondrial RNA analysis has indicated that the coastal species of cod were created by passage of fish over the Great Dividing Range about one million years ago. The eastern taxa of *Maccullochella* are closely allied to Murray cod but divergence between Trout cod and Murray cod is much greater than that between the latter and the coastal forms, suggesting that the separation of these two species was a much more ancient event occurring around seven million years ago (Jerry *et al.,* 2001; Nock *et al*., 2010). The mechanism driving the divergence of the two cod species in the Murray- Darling Basin can only be speculated. The fossil evidence is so sparse as to provide no indication of where and when the separation took place. All that can be concluded is that two species evolved and were present when Europeans arrived in the basin.

Berra and Weatherly, despite the assistance of the fisheries authorities of two states, professional and amateur fisherman, could only reliably collect living specimens of Trout cod from the Seven Creeks and Lake Sambell. Ironically the species was not native to either location, but had been translocated to those waters by anglers in previous years (Cadwallader & Gooley, 1984). Only one living specimen was collected from of the rest of the Murray-Darling Basin by angler Anthony Bell from the Murrumbidgee River near Angle Crossing in the ACT. Further fish were taken by a number of local anglers including Gordon Winter and Keith Shields from the same area in subsequent years. Writing on their findings Berra and Weatherly concluded: 'Trout cod in our opinion represent a rare and endangered species. Their extremely restricted present distribution makes them especially vulnerable. If some calamity were to befall Seven Creeks or Lake Sambell trout cod would probably become extinct' (Berra & Weatherly, 1972). The issue as to the existence and status of Trout cod had been resolved. Their warning was a call to arms to scientists and managers to act to bring the fish back from the brink of extinction and restore former populations. The debate on the existence of this enigmatic fish was brought to a conclusion, but was replaced by a new debate as to where it was originally found and what type of habitat was suited to it, questions fundamental to ensuring its recovery.

Photograph 5.11 Lake Sambell Trout Cod

Top: Lake Sambell, Beechworth, January 2006. Trout cod were introduced to the lake after its construction in 1928 and established a self-supporting population. In July 1970 it was one of only two waters in the Murray Darling Basin in which Tim Berra and Allan Weatherly could reliably capture specimens as part of their study to demonstrate the existence of two cod species. The population was decimated by a massive fish kill in September 1970 and until recently extinct in the water. In 2010 DPI Victoria commenced stocking the lake with hatchery produced Trout cod to create a recreational fishery. Photo courtesy of Paul Bannister.

Bottom: This image of an 11 kg Trout cod, captured from Lake Sambell in July 1970, presents the markings and features from a dorsal perspective on what would be considered to be a reasonably large specimen. The fish is heavily speckled with highlighting around the markings and the conical head and pointed snout are evident. The grey/blue coloration present on the head is quite distinctive and gave rise to the popular colloquial Victorian name 'bluenose'. Photo courtesy of Professor Tim M. Berra, Ohio State University.

Photograph 5.12 Large Trout Cod from Lake Sambell

These large (>10 kg) Trout cod were captured by Tim Berra and Allan Weatherly from Lake Sambell in July 1970. Fish from that source as well as the Seven Creeks were utilized to ultimately confirm the animal as a distinct species to Murray cod. This photograph is probably the best ever taken of large Trout cod and clearly depicts the markings and coloration of large examples of the species. Photo courtesy of Professor Tim M. Berra, Ohio State University.

6 The Key External Differences between Murray Cod & Trout Cod

Berra and Weatherly (1972) listed the key external distinctive features of Trout cod as being an overhanging upper jaw, straight head slope, longer snout, a prominent dark stripe through the eyes and grey colour with a speckled pattern. In contrast Murray cod possesses jaws of equal length or the lower jaw protrudes, a concave head slope, a shorter snout, a faint or absent eye stripe, and green colouration with a mottled pattern. These distinctions were identified by the comparison of living and preserved specimens of both types of cod. A total of 120 live Murray cod, collected from the Darling, Lachlan, Murrumbidgee and Murray Rivers and 29 live Trout cod, collected from Lake Sambell, Seven Creeks and the upper Murrumbidgee River, were examined, as well as 36 museum specimens of Murray cod and 25 museum specimens of Trout cod originating from across the Murray-Darling Basin. The Murray cod specimens ranged in length from 30.70 mm up to 1235.00 mm and the Trout cod ranged from 64.00 mm up to 685.00 mm in total length (Berra & Weatherly, 1972). A number of other features such as a generally longer caudal peduncle, larger eyes and broader white margin on the tail were identified as features typical, but not distinctive, of Trout cod, as the range of these features overlap considerably between the two cod species. The single reliable apomorphic physical difference between Trout cod and Murray cod is that in the former when the jaws are closed the upper jaw overhangs the lower jaw.

The author, between the late 1960s and early 1990s, examined in excess of a hundred Trout cod captured by angling from the Murray, Buffalo, King and Mitta Mitta Rivers and the Seven Creeks. This sample greatly exceeds the 29 live specimens examined by Berra and Weatherly and was sourced from four additional waters containing wild populations of Trout cod at that time. None approached the size of the largest fish they examined, at around 11 kg, though a number of fish from the Murray River exceeded 5 kg and one from the Seven Creeks was estimated to be over 6 kg in weight. The author has also examined all the museum specimens of Trout cod held by the *Australian museum* and a number at other locations. It is from the observations of these fish, as well as observations of stocked specimens in the Ovens, Goulburn and Murrumbidgee Rivers in recent years, those reported by Berra and Weatherly in 1972 and observations sourced from anglers familiar with the two cod species that the following discussion on the external differences between the two types of cod has been prepared.

The coloration and markings of the two types of cod are the source of much confusion amongst anglers and in some publications. Berra and Weatherly's statement of Trout cod being 'livid' grey (a dull grey-green) and the Murray cod green is a generalization of the specimens they saw (Berra & Weatherly, 1972). The colour of both types of cod is highly variable and dependent upon the clarity of the water and the size of the fish. Trout cod from turbid water can possess a general golden/tan coloration while small Murray cod under the same conditions are often white or pale yellow with dull grey or green blotches (Author's obs. of Trout cod and Murray cod from the Murrumbidgee River near Narrandera). As Murray cod grow larger (>10 kg) in turbid water, they often take on a light grey-blue colour background colour (Author's obs. of Murray cod from the Murray River near Echuca and the Murrumbidgee River near Darlington Point).

Trout cod taken under moderately clear conditions from the Murray River near Cobram were grey and often distinctly blue on the dorsal surface (Author's obs.). Some Trout cod captured from the Murray River when the water was very clear exhibited the 'livid grey' (green-grey) colour reported by Berra and Weatherly (1972) and were never the bright green colour of Murray cod that could be taken from that water under similar conditions (Author's obs.). No Trout cod taken from the Seven Creeks by the author have ever exhibited the distinctly blue colour of some Murray River fish with most being livid grey when taken from clear water and light grey under turbid conditions. Similarly specimens from the King River lacked any bluish coloration although those from the Buffalo River were sometimes quite dark blue (Author's obs.). Large (>4 kg) specimens of Trout cod from the Murray River have exhibited a dark blue or black coloration on the head (Author's obs.) which has

been reported by a number of senior anglers this feature giving rise to the colloquial name 'bluenose'. When specimens of the two cod species from the same water at the same time are compared the coloration is usually different but given the variability in colour under different conditions in general coloration, while useful, is not a diagnostic feature.

The markings of the two types of cod are generally very distinctive in fish below about 5 kg in weight (Author's obs.). Trout cod are usually prominently marked with a pattern of dark grey or black spots and dashes, with brighter highlighting around them. Rarely, modern anglers have reported the markings on Trout cod to be a russet or orange colour and this was observed in the Bathurst holotype (Lesson, 1930) though this may have been an artefact of its preservation. Smaller Murray cod are usually covered from head to tail with grey or green blotches creating a generally mottled appearance which may be overlain with some darker spotting (Author's obs.). The distinctions in the markings of the two cod species become somewhat ambiguous as the fish grow larger. In some larger (>10 kg) Murray cod the pattern may break up into numerous lines and spots or general spotting all over the body and can be covered in numerous Trout cod-like dashes (Author's obs.). Some elderly anglers familiar with larger Trout cod in the past have stated that some specimens they caught were heavily spotted (Laddie Clifford, Bert McKenzie, pers. com.) and this is visible in the few photographs of larger Trout cod exceeding 10 kg that have been published (Lake 1967 b & 1971, Berra & Weatherly 1972, Berra 1974, Berra 1975). In some of these images the fish is peppered with fine spots with the dashed markings diminished in number thus resembling the markings present on some Murray cod over about 10 kg in weight. As Trout cod get larger, the dashed markings may extend in numbers over the head, this characteristic being quite apparent in some of the old preserved specimens and the head of a large specimen from the Goulburn River (Berra, 1974). Larger specimens of Trout cod from the Seven Creeks are usually very heavily spotted including the head (Author's obs.).

Many anglers believe that the presence of a head stripe through the eye is also diagnostic of Trout cod but it is not a distinguishing feature. Certainly in most small Trout cod it is obvious in life, though may fade rapidly after death. It may also be present in small Murray cod but tends to be comprised of a series of fine lines rather than a broad mark and is usually not present in fish over five kg (Author's obs.). In Trout cod the eye stripe can vary from a sharply defined fine line to a vague broad marking and in larger fish the eye stripe can be less distinctive (Author's obs.). Anglers have reported that it may sometimes be absent in large specimens (Laddie Clifford, Henry Davies, pers. Com.). Both types of cod can develop dark patches or mottling over their body after death while some Trout cod may become entirely black, while at the same time the spots and dashes diminish in prominence. This is demonstrated clearly in a comparatively recent colour photograph of a Trout cod taken by Rod Harrison from the Murray River at Brigenbrong in 1972 (refer to the section on the Upper Murray River). Where fish have been in contact with the ground or other surfaces the skin can become bleached white.

6.1 Key External Features of Murray cod & Trout cod

(Based on Berra & Weatherly, 1972. Text in italics is based on the Author's observations of living specimens of both species from the Seven Creeks and Murray, Buffalo, King and Mitta Mitta Rivers)

Table 6.1 Key External Features of Murray cod & Trout cod

Feature	Murray cod	Trout cod
Jaws	Jaws equal or lower jaw protruding. *When the mouth is closed the jaws are equal in length or the bottom jaw is longer.*	Upper jaw overhangs lower jaw. *When the mouth is closed the top jaw is longer and overhangs the lower jaw.*
Head	Head concave between the eyes, snout short. *Head usually flattened with a concave profile, eyes usually placed towards the top, may be strongly depressed between the eyes, snout usually blunt and short. In larger fish the head may be more conical.*	Head slope straight, snout long. *Head conical with a straight profile, may be slightly depressed between the eyes, eyes placed towards the side, snout long and pointed.*
Background Colour	Yellowish green with dark markings. *Background colour varies from white to yellow to bright green in smaller fish, though some larger fish may have a steel grey colour.*	Livid grey. *Varies from a light tan colour, to steel grey, to dull blue, to 'livid grey' (A dull grey-green colour).*
Body Markings	Grey to black mottling becoming reticulated in very large specimens. *Small to moderate fish covered in blotches or mottling, grey to dark green in colour. In larger fish (>10 kg) the mottling may break up into general grey or black spotting.*	Small black spots some of which are elongated into dashes. *Smaller fish marked with dark grey to black spots and dashes. Larger fish (> 5 kg) may be heavily marked with numerous fine spots and prominent dashes.*
Head Markings	*Patches or mottling which may break up into heavy spotting in large fish. Markings may include fine lines through the eyes in small fish (<5 kg).*	Dark stripes on the head extending through the eyes. Very few spots on head in most specimens. *In smaller fish there are usually few spots on the head, but larger fish can have many spots (refer to photographs). A dark stripe, which may be broad or fine, is present through the eyes though may fade after death or during stress. Larger fish (>5 kg) may have a very dark snout and a black or blue patch on top of the head between the eyes.*
Eye Size	Smaller than Trout cod of a similar size, but not a reliable feature.	Large than Murray cod of a similar size, but not a reliable feature.
Caudal Peduncle	Generally a shorter caudal peduncle than Trout cod, but not a reliable feature.	Generally a long caudal peduncle than Murray cod, but not a reliable feature.
Fin Markings	Commonly have narrow white or *pink* margins, *often absent in large fish.*	Have broad white fin margins.

Photograph 6.1 Murray Cod and Trout Cod Compared

Top: Photograph of a Trout cod weighing about one kg captured from the Murray River near Barmah in 2006. The fish displays the typical appearance of fish in the Murray River population with the distinctly grey coloration, is lightly marked with dark spots and dashes, possesses a dark stripe along the head passing through the eye and has a very straight head slope. The overhanging upper jaw is quite apparent.

Bottom: Photograph of a similar sized Murray cod captured from the Murray River in the same area as the photo above. The fish displays the typical yellow/green colouration and mottled pattern present in smaller animals. The more concave slope of the head is evident but the protruding lower jaw is obscured by the fishing equipment. A faint, obscure line is just visible passing through the eye. It is more apparent in very small Murray cod and is never present in fish much bigger than the one in this image. Both photos courtesy of Ramon Clifford.

Variations in the distribution and intensity of the body markings of Trout cod.

Top left: A stocked Trout cod captured from the Ovens River. Note that the individual markings are very fine, that few are present in the anterior half of the animal and almost none on the head. The dorsal colour is generally grey with a distinctive purple/blue colour on the snout and head. Photo courtesy of Adam Bosley.

Top Right: Another stocked Trout cod captured from the Ovens River near Peechelba. The fish is much darker and is also much more heavily marked. Individual markings are much broader and the background colour is slightly mottled highlighting the markings. Photo courtesy of Adam Bosley.

Bottom left: This large (≈ 6 kg) trout cod was angled in July 1983 from the Seven Creeks at the base of the Gooram Falls. Trout cod from the Seven Creeks are often heavily speckled, including the head, and the markings are sometimes quite broad. In this individual the markings were reasonably dense and completely covered the head. Photo courtesy of Collin Luker.

Bottom right: Some anglers are reporting the capture of 'hybrid' Murray cod/trout cod such as the fish depicted in this image taken from the Murrumbidgee River in 2006. While hybrids have been produced artificially under hatchery conditions they are rare in the wild. The markings on this specimen appear intermediate between those of a Murray cod and a typical Trout cod and the head stripe resembles that seen in juvenile examples of the former. However, the shape of the snout and overhanging upper jaw are diagnostic of a Trout cod. Certain identification as a hybrid is only possible through laboratory testing. Photo courtesy of Nigel Paton.

Photograph 6.3 Trout Cod Heads

Top Left: Head of a Trout cod from the King River showing the conical snout, straight head slope and few markings on the head. Photo author.
Top Right: Photo of the preserved head of a Trout cod weighing about 12 kg taken from the Goulburn River near Thornton c1960. A slight depression between the eyes is visible and the head is covered with spots and dashes. The tip of the snout clearly overhangs the bottom jaw. Photo courtesy of Professor Tim M. Berra.
Bottom: Photo of the head of a Murray cod from the Murray River. In large Murray cod the mottled markings may be replaced by heavy spotting similar to that of Trout cod. This is apparent in this image though the animal is readily identified as a Murray cod by the long lower jaw. A number of historical sources such as Whitley (1937) suggested that the two cod species become more similar with size though the head and jaws of Trout cod are always distinctive. Photo courtesy of Ramon Clifford.

7 Methodology: Reconstructing the Past

7.1 Describing Fish Abundance

Progress towards achieving the goals of the *Native Fish Strategy* is monitored by the *Sustainable Rivers Audit* first published in 2008 (Davies *et al.,* 2008). The assessment of native fish stocks in waterways is undertaken by comparing contemporary data on fish populations collected by surveys with a set of reference conditions indicating the original abundance of fish species at the time of European settlement. The reference conditions are developed by an 'expert panel', a group of scientists familiar with a catchment or region, who use a range of evidence to describe the original expected abundance of fish species. The evidence considered includes museum records, old government data, historical accounts and personal judgement of the suitability of habitat for individual species based on contemporary evidence of habitat association.

Fish abundance can be described in a variety of numerical ways such as density or catch effort. However, data of this nature has only been collected in recent decades and does not exist for native fish populations at the time of European settlement. The *Sustainable Rivers Audit* reference conditions employ 'rarity scores', numerical indicators of fish abundance. The scores are not precisely defined, but are general descriptors of the former abundance of individual species in the main channel of larger waterways in specific catchments. A rarity score of '0' signifies the total absence of a species, a '1' that they were rare, a '3' that they were common and a '5' that they were abundant. Where a species was restricted to a section of stream due to a barrier, it was scored on its abundance in the area where it was present. In some cases the terms 'upper' and 'lower' may be assigned to rarity scores providing a finer grained description of abundance (Frederick Bouckaert, MDBA, pers. com.).

The process of developing reference conditions and assigning rarity scores is dynamic, with regular reviews of the evidence and subsequent amendment if new information becomes available. The system does, however, have the potential to introduce bias. For example assigning scores based on the abundance in the main river channel could produce an underestimate of the former presence of species whose habitat preference is the floodplain or billabongs. Making judgements based on current habitat associations of individual species may also introduce bias, given the fact that virtually all environments in the basin have been modified and that native fish populations are greatly reduced.

In this project native fish abundance has been described so as to be comparable with the rarity scores employed in the reference conditions, but more precisely defined. As most of the information collected on historic native fish abundance referred to fish taken by angling, abundance is described in terms of the frequency of capture and the numbers taken by this means. This too can introduce bias as it may overestimate the abundance of species highly susceptible to angling or specifically targeted by this means. In the upper Murrumbidgee River anglers have reported Trout cod to be preferentially caught to Murray cod (Lintermans *et al.,* 1988) so angler accounts may tend to inflate their relative abundance. Similarly it may underestimate the abundance of those less susceptible to angling or less sought after by anglers.

The rarity scores in this project have been defined on what was typically reported from the oldest available accounts for the main channel of major streams in each habitat zone of a catchment. Fish captures can vary seasonally and between years and no attempt was made to average scores over the course of a full year. The scores were based on the most frequently reported numbers of fish taken during the locally recognised season and ignored times of the year such as winter when generally fewer fish were taken.

The scores are defined as follows:

0 = Absent: no credible account reporting the species former presence;
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year;
3 = Common: regularly taken by a resident angler in small numbers; a typical expected catch would be less than 5 fish per day. The species may have been patchily distributed preferring specific reaches or habitats;
5 = Abundant: frequently taken by a resident angler in good numbers; a typical catch would exceed 5 fish per day. Generally found along the length of the main channel though may have exhibited some local variations in abundance.

In addition the symbols 'U' and 'L' have in some instances been used representing abundance at the upper end of a score and that at the lower end respectively. These have been employed where there is some uncertainty between two potential scores or where abundance varied significantly along a section of stream.

7.2 The Habitats

The *Sustainable Rivers Audit* defined habitats within river catchments as a series of zones. The definition of these zones was developed by the former MDBC based on the Murrumbidgee River where distinctive environments were associated with altitude. They are defined as a lowland zone (< 200 m ASL), a slopes zone (200 – 400 m ASL), an uplands zone (400 – 700 m ASL) and a montane zone (>700 m ASL) (Lintermans, 2007). Using the Murrumbidgee River as a model, the lowland zone has a low gradient and wide, extensive floodplains, the slopes zone is confined by hills or mountains with a much narrower floodplain and the upland zone has a steeper gradient with a relatively narrow river valley. There is also a distinctive difference in the substrates in these three types of habitat from silt, sand and clay in the lowland zone, to sand, coarse gravel and some rock in the slopes zone, to extensive exposure of bedrock in the upland zone. The montane zone is less well defined but implies areas where regular snowfalls occur. Montane streams can have a similar form to those of the upland zone or may flow through alpine or sub-alpine plains with adjacent swamps.

The Murray-Darling Basin is tilted upwards in a north east direction so that the changes in river morphology occur at progressively higher elevations northwards. In Victoria these changes occur rapidly as a result of the steeper gradients and at generally lower altitudes than those defined for the Murrumbidgee River. Similarly in northern NSW the changes in river morphology occur at higher altitudes. For simplicity the same types of habitat zones as those in the *Sustainable Rivers Audit* have been used and the altitudinal definitions largely retained but in a small number of cases the boundaries have been modified to reflect the actual physical form of the waterways. In the descriptions for each river catchment these zones have been geographically identified to provide clarity. While the rarity scores are defined in terms of fish abundance in the main river channels, the discussion for each river catchment highlights variations in fish distribution and abundance in a range of habitats other than main river channels such as the smaller streams, billabongs and lakes.

7.3 Evidence Collected

In this project three types of historical evidence were mainly collected on the past distribution and abundance of Trout cod and other large native fishes of the basin, these being photographs, written accounts and oral history. For Trout cod, records held in museum databases were also located and used. As many museum specimens predate the final description of the species in 1972 it was essential that museum records were confirmed as being of Trout cod. In the case of the *Australian Museum* most surviving specimens were examined by the author to confirm their identity. Where specimens were held in overseas collections, curators

either arranged for a taxonomist to confirm their identity, or photographs of the specimens were supplied. For the other, larger, native fish species, museum records were not sourced as they, along with more recent collections, have been mapped (Lintermans, 2007). However, a number of old published accounts describe the details of their collection, sometimes with indications of their abundance, and these have been used.

Nearly 400 photographs of catches of cod and other native fish were located and examined, most of which predate 1950 and the oldest dating from 1862. Photographs were sourced from anglers, angling clubs, individuals, historical societies, books and newspapers. Most were in the possession of local families passed down over the generations. Photographs were scanned at a resolution of 800 dpi, but some of high quality were scanned at 1200 dpi, and saved as jpg's. Private photographs were given an identity describing the catchment and number (eg. OR12 = Ovens River # 12) and electronic copies lodged with the MDBA. Photographs sourced from institutions or publications are identified by the source and either title or catalogue number. Where necessary images were enlarged or enhanced to facilitate the identification of fish.

An extensive search of old written accounts of captures of native fish was undertaken. This included the writings of early settlers, naturalists and anglers. A large number of hand-written manuscripts held in the collections of the *National Library of Australia* and the *State Library of Victoria* were searched for accounts of fish. The reports and appendices published by the Legislative Assembly of NSW on the activities of the NSW State Fisheries Department were thoroughly examined. Electronic versions of a number of newspapers held in the *National Library of Australia*, including the Melbourne *Argus* and the *Sydney Morning Herald*, were searched for stories on native fish up to the 1940s. Key words likely to reveal articles such as 'fishing' or 'fish' combined with the names of individual waterways or fish species were used. The search was fairly comprehensive though many articles have probably been missed due to poor letter recognition in old text by the search engine. In some cases regional historical societies have developed records or databases on news items and these were perused for possible stories on fish. Some regional newspapers stored on microfilm by the *State Library of Victoria* were searched around the times that fish translocation activities took place, or when exotic fish were introduced, as it was suspected that they may discuss the status of local native fish populations at the time. While many useful stories were located, a vast number in regional newspapers must remain unidentified.

Local historical societies and angling clubs were contacted to help identify senior residents that may possess knowledge of fish. Initial interviews in most cases were conducted by phone often followed up by second conducted in person by the author. In some instances only a few comments were provided, but some interviews lasted over an hour. The general ethical guidelines outlined by the *Oral History Association of Australia* for interview (www.ohaansw.org.au/page/guidelines_to_ethical_practice.html) were followed, with the interviewees being informed of the purpose of the project, how their interview was to be published and that information they considered confidential was not included. Typical questions included asking the person to describe their personal history, what fish they caught including when and where, and the changes they observed over the years. They were asked to describe the fish so as to confirm the identity of the species being discussed. For interviews conducted in person the angler was shown a random selection of contemporary photographs of native fish and asked to name them. This often provided a definitive identification of the species discussed in the interview. Emphasis was placed on providing a timeframe for observations or key events either by the individual providing dates or descriptions of phases in their lives. Interviews were recorded by hand, word processed and provided to the individual for correction and confirmation. Brief comments or additional information provided after interviews have been recorded as comments or 'personal communications'. Over 140 people were contacted with the two oldest being 95 years of age whose memories reached back into the 1920s.

7.4 Assessing the Information

Given the similarity of the two cod species, the scientific uncertainty as to the existence of Trout cod up to 1972, and the confusion over the correct scientific names for Murray cod and Trout cod, care has to be exercised in confirming the identity of cod in historical accounts. Douglas *et al.,* (1994) suggested that some angler reports of Trout cod in north east Victoria were the result of misidentification and there is evidence that post World War Two the term 'Trout cod' was applied by some anglers to any cod with a thin build (Trueman, 2007). Apart from 'Trout cod' other terms used by anglers for this species and in some written accounts are 'Murray trout', 'bluenose' and 'Rock cod'. The problem of reliable identification also exists for other fish species. Some distinctive names used are 'yellowbelly' and 'callop' for Golden perch, 'grunter' for Silver perch and 'jewfish' or 'eel-fish' for Catfish, and are good indicators of the identity of the species. Two species of Blackfish have only recently been recognised (Sanger, 1984) and it is impossible to separate them in historical accounts, often referred to as 'greasies', 'slipperies' or 'slimies' which are distinctive, and identify them as Blackfish, but not which species. Throughout this document the term Blackfish is used as applying to either or both species. Other terms such as 'bream' or 'Murray perch' are less specific and have been applied by anglers to a range of species. Identification is not certain even when fairly specific common names are used. For example some anglers refer to dark coloured Silver perch as 'Macquarie perch' and similar species may be confused by less experienced anglers.

Validation of historical accounts, and in particular oral history, can employ 'triangulation' approaches involving cross-checking of information with external empirical sources such as photographs, government records and newspaper stories as well as corroborating information from multiple observers (Robertson *et al.,* 2000). Multiple historical accounts of the same observation from independent observers increase the reliability of the observation suggesting that it may be accurate. Certain individuals, because of their background, such as some prominent early naturalists, scientists and enforcement officers, are 'expert witnesses' and their observations are likely to be reliable. Museum specimens and unambiguous photographs provide indisputable physical proof of a species former presence in a water, provided there is good confirmation of their origin.

During this project individual pieces of historical evidence for the presence of native fish in specific waters was identified and its reliability assessed and rated as high, moderate or low. The source localities of the reported captures were recorded with grid references using 'ACME Mapper' and in the case of many oral accounts with high accuracy in the presence of the individual interviewed. An estimate was made at that time of the accuracy of the source location.

A species was determined to be present in a water if it satisfied one of the following criteria:

(a) A museum specimen exists supported by documentation of its origin;
(b) A photograph exists clearly showing key features permitting accurate identification. In the case of Trout cod images considered to be conclusive were examined by a number of scientists for confirmation;
(c) A written account by an expert witness exists who has demonstrated familiarity with the species concerned;
(d) A written or newspaper account describes the presence of the species in the water using a scientific name or an unambiguous common name and is supported by a good description or other evidence;
(e) A first hand account by an angler reports the species presence with a detailed physical description including key discriminating features and the angler has the ability to accurately identify it in photographs and/or continues to capture the species at present. Other independent evidence supports the species presence in the water;

(f) Multiple second hand accounts 'triangulated' by other evidence including photographs of modest quality and the species confirmed presence nearby.

From the information collected, maps were created recording the locations of historical accounts for each species considered to be of high quality in each river catchment. For many old accounts it is certain that cod were taken but it is impossible to reliably identify the species of cod due to insufficient information. As many of these records are of significance they have been recorded on the maps as 'cod'. Once a species was confirmed as being present in a water, its rarity rating was determined based on the collective descriptions of its abundance.

The historical material has been collated and summarised for each catchment. Each chapter commences with early European accounts of the fishery, followed by a review of the evidence used to confirm the presence of species and assign rarity scores, an overview of the changes to native fish populations that have transpired, and a summary of significant environmental changes and events that may have contributed to the decline of native fish populations. It concludes with the assessment of current native fish populations in the catchment provided by the *Sustainable Rivers Audit*.

Photograph 7.1 Habitat Types of the Murray Darling Basin

These images depict the typical features of rivers in the four habitat zones used in the *Sustainable Rivers Audit.*

Top Left. The Goulburn River upstream of Mitchellstown is lowland habitat and flows through a wide flood plain with a low gradient over a substrate of clay and mud.

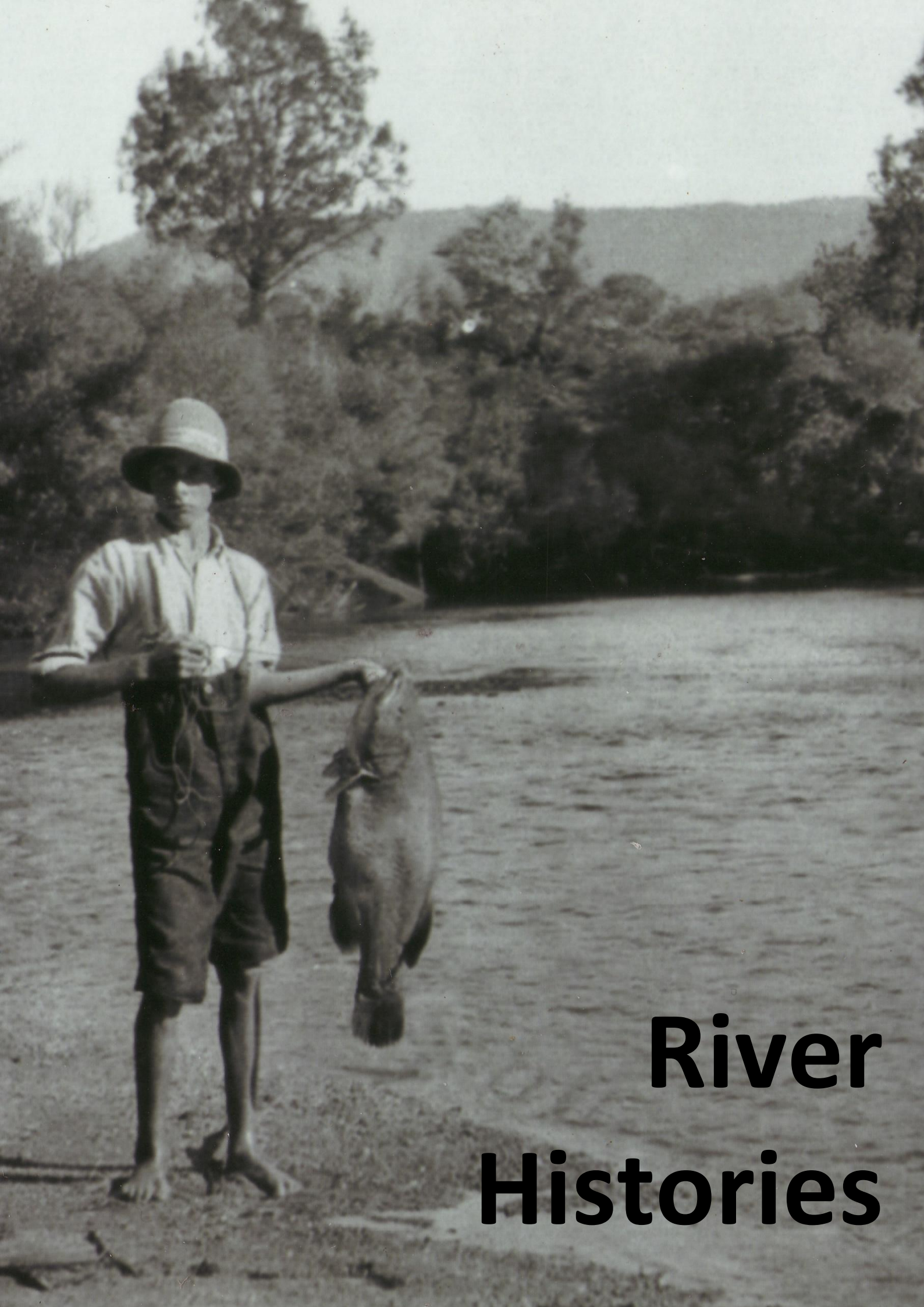
Top Right: The Goulburn River near Kerrisdale represents slopes habitat with increased gradient, a narrow flood plain confined by low ranges and flowing over extensive gravel substrates.

Bottom Left: The Goulburn River upstream of Jamieson is an example of upland habitat and has a steep gradient with no flood plain and flows over gravel and rock substrates.

Bottom Right: The Goulburn River upstream of Woods Point is in the Montane Zone. Some montane rivers, like the Goulburn, have steep gradients and flow over bedrock while others rise on alpine tablelands, have relatively low gradients and exist as chains of ponds.

Photograph 7.2 Variations in Photo Quality

These images depict the degree of uncertainty that can exist in identifying Trout cod in photographs. The top image was considered to be a certain record by all who viewed it. For the second image initial opinion was divided between it being a probable or certain record. When enlarged and viewed in high resolution most people considered it to be a confirmed record. Opinion on the third image also ranged from probable to certain but with clear evidence of the upper jaw being longer it has been concluded to be a confirmed record. The bottom image is certainly of a cod and some features suggest that it could be a Trout cod but the quality prevents identification.



River Histories

8 Goulburn River Catchment

BOAT TRIP ON GOULBURN.

JOURNEY OF 160 MILES.

SEYMOUR, Monday.—A party from Seymour, comprising Messrs. M. Geoghegan, F. Young, H. Gates, and A. Walkingshaw, undertook a trip down the Goulburn River during the holidays. They launched their boat above the Acheron River, beyond Alexandra, and proceeded down stream to Seymour, a distance of about 160 miles. The journey was undertaken by some of the members of the party in the Christmas of 1914, when the river was very low, and difficulty was experienced in getting through. On this occasion no trouble was met with, the stream being navigable the whole distance, although a little rapid in places, where care had to be exercised. The country presented a striking contrast to its condition at the same time last year. The grass along the flats on the Upper Goulburn has scarcely lost its verdure, and the stock are in splendid condition. A marked feature of the journey was the absence of rabbits along the banks of the stream. The trip was a sporting one, fishing being the main amusement. Each day "spinning" was indulged in whilst the boat was drifting with the stream. In all 88 cod were secured, the weights ranging from 2½lb. to 18lb., as many as 18 being caught in a morning's fishing. The party arrived at Seymour on Sunday evening.

Argus, 5 January 1916

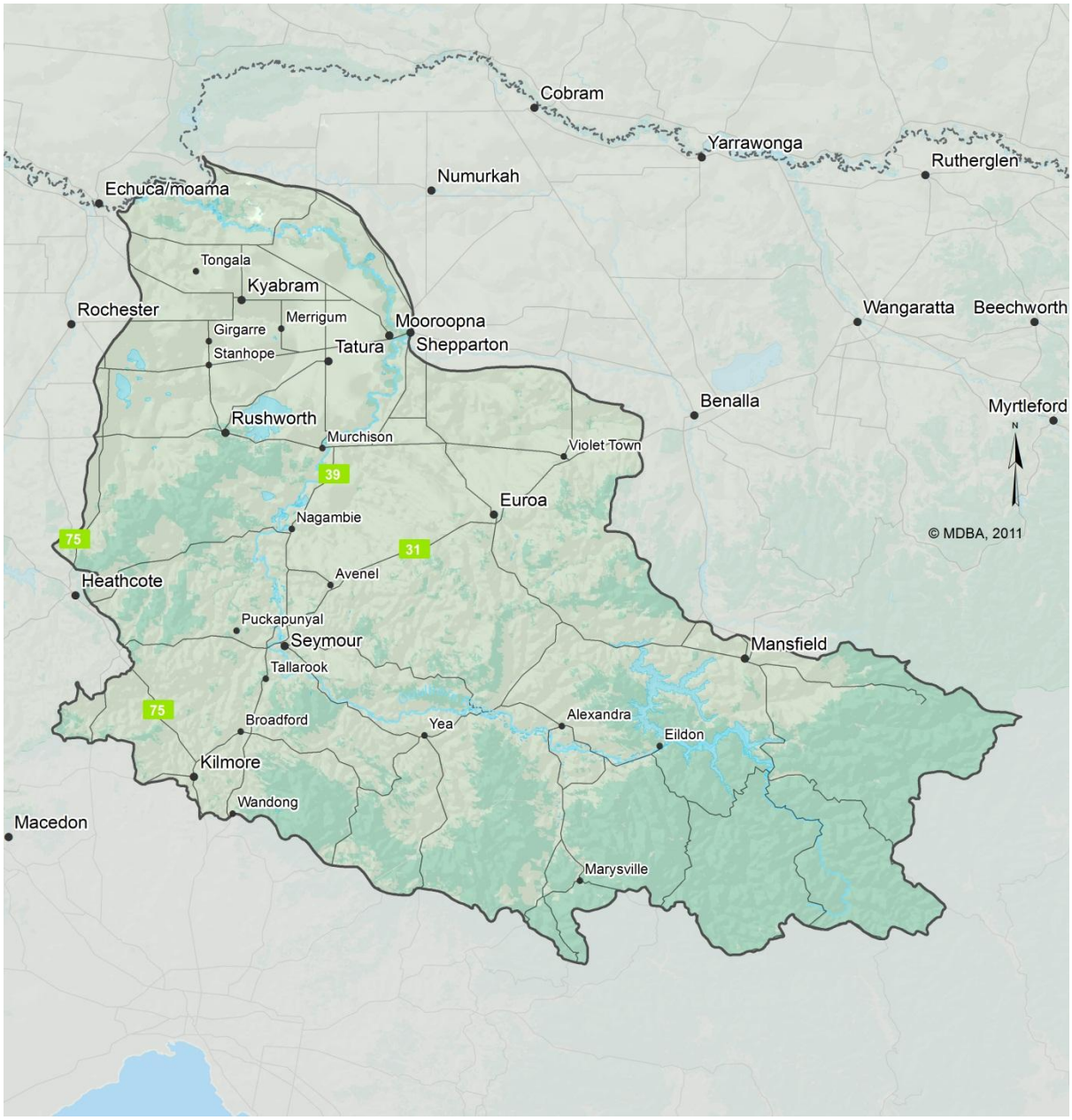
BOAT TRIP ON GOULBURN.

JOURNEY OF 160 MILES.

SEYMOUR, Monday – A party from Seymour, comprising Messrs. M. Geoghegan, F. Young, H. Gates and A. Walkingshaw, undertook a trip down the Goulburn River during the holidays. They launched their boat above the Acheron River beyond Alexandra, and proceeded down stream to Seymour, a distance of about 160 miles. The journey was undertaken by some of the members of the party in the Christmas of 1914, when the river was very low, and difficulty was experienced in getting through. On this occasion no trouble was met with, the stream being navigable the whole distance, although a little rapid in places, where care had to be exercised. The country presented a striking contrast to its condition at the same time last year. The grass along the flats on the upper Goulburn has scarcely lost its verdure, and the stock are in splendid condition. A marked feature of the journey was the absence of rabbits along the banks of the stream. The trip was a sporting one, fishing being the main amusement. Each day "spinning" was indulged in whilst the boat was drifting with the stream. In all 88 cod were secured, their weights ranging from 2 1/2lb. to 18lb., as many as 18 being caught in a morning's fishing. The party arrived at Seymour on Sunday evening.

Argus, 5 January 1916

Figure 8.1 The Goulburn River Catchment showing major waterways and key localities



8.1 Early European Accounts

The Goulburn River has the greatest flow of any of the Victorian tributaries of the Murray River and effectively bisects northern Victoria. It rises in the east at the foot of Mt Buller, flows west collecting water from the Great Dividing Range, then turns north near Seymour to flow towards the Murray. As a consequence of its size and proximity to Melbourne, the Goulburn River and its well watered catchment was settled early in the history of Victoria. It has, for the same reasons, been one of the most popular inland angling waters in the state.

The first Europeans to encounter the Goulburn River were Hamilton Hume and William Hovell, reaching it near the present site of Molesworth on December 3, 1824. Hume originally named the river after the Colonial Secretary Frederick Goulburn. Later, Hume learned of the naming of another river in New South Wales after Goulburn, and with the agreement of Charles Sturt it was decided to name the river after Hovell (Bland, 1831). The latter did not gain general acceptance, and today the river retains its original European name.

In their first encounter with the Goulburn River, Hume and Hovell recorded catching fish, an activity they talk about on a number of other occasions during their time in the catchment. After arriving at a stream termed the 'Muddy Creek', now known as the Yea River, they caught 'several fish similar to those found in the Lachlan' (Bland, 1831). On December 11, members of the expedition fished the King Parrot Creek near Strath Creek where 'they caught a couple of Lachlan cod fish', and on the return journey northwards on Christmas Eve, they camped on the Goulburn near Seymour 'in order that they might avail themselves of the fine fish which abound in its waters' (Bland, 1831).

Twelve years later, Major Thomas Mitchell drove cattle to Portland in Victoria. During the return journey on October 8, he camped on the Goulburn River near the current locality of Mitchelton and recorded the presence of fish, as well as an indigenous name for the waterway:

> This river has been unfortunate in obtaining a variety of names and therefore less objection can be made to my preference of the aboriginal which I ascertained through Piper to be Bayunga. We already have a River Goulburn in New South Wales / In this river we caught one or two very fine cod-perch, our old friends Gristes peelii (Mitchell 1838).

Mitchell travelled during the wet months of Victoria's spring, and the ruts left in the mud by his dray were literally a road map recording his route.

On New Year's Day 1838, Joseph Hawdon set out to follow those ruts droving cattle and sheep, reaching the same spot on the Goulburn on January 17. He then followed the river downstream and, on January 23rd 1838, in the Murchison area he wrote:

> In the evening we amused ourselves with bathing and fishing for cod, which very much resembles the English fish of the same name, except that on the back the former has a sharp fin. Those we caught generally weighed from 6 to 15 pounds, but they were caught sometimes weighing 30 pound (Hawdon, 1952).

Settlers progressively established sheep and cattle stations in the Goulburn Valley. In 1854, alluvial gold was discovered in the upper reaches of the catchment at Rations Point, near the junction of the Goulburn and Jamieson Rivers. Major goldfields were established at Jamieson and Woods Point on the Goulburn River, and at Enochs Point on the Big River, with lesser workings on the Howqua River, near Alexandra and in the Gobur area. Minor workings occurred at various other localities throughout the catchment. Eventually, by the late

1870s, the alluvial workings declined in activity, as much of the gold had been extracted from the streams and the quartz reefs containing lodes were discovered leading to underground mining (Flett, 1979).

In 1849, it was recorded that the Goulburn River near Seymour 'abounds in fish, mostly cod and bream, also crayfish' with cod up to 43 lb. (19.5 kg) being taken at that time (*Argus*, 31 October 1849). In 1923, one angler caught 30 fish weighing a total of 158 lb. (71.7 kg) in one day (*Argus,* 13 December 1923). Further upstream at Alexandra (1868), a catch 'included two cod about 30 lb. each', and 'about a dozen smaller ones from 3 to 15 lb., and about half-a-dozen perch averaging about 3 lb. each' (*Alexandra Times,* 21 August 1868).

At Thornton in 1902, a party of anglers 'caught upwards of 120lb. weight of fish, chiefly cod, bream, and perch, being the biggest day's haul this season for three lines' (*Argus*, 7 January 1902). In 1916, the result of a boat trip from the Acheron River to Seymour was 'in all 88 cod were secured, the weights ranging from 2¼lb. to 18lb., as many as 18 being caught in a mornings fishing' (*Argus*, 5 January 1916). Robert Forsyth at Maintongoon on the Delatite River near the Mountaineer Creek junction regularly recorded in his journal catches of cod (Forsyth, 1899). In the mountain goldfields, newspaper accounts reported large catches of both cod and 'bream' in the Jamieson and Goulburn Rivers (*Jamieson Chronicle*, 14 November 1885, 10 December 1909).

As the owner of the Argus newspaper, Edward Wilson was a prominent figure in early Melbourne. He was an early and active proponent of the introduction of exotic plants and animals to the continent, founding the Acclimatisation Society of Victoria in 1861. In 1857, Wilson organised the translocation of cod and bream from the upper reaches of the King Parrot Creek to the Plenty River, a tributary of the Yarra River (Wilson, 1857). The translocation of these fish, along with additional cod sourced from the Murray and Goulburn Rivers, and Macquarie perch periodically sourced from the Goulburn and Broken Rivers, resulted in the establishment of Murray cod, Trout cod and Macquarie perch populations in the Yarra catchment (Acclimatisation Society of Victoria, 1864; *Argus,* 8 September 1898; Trueman, 2007). The Goulburn River, principally at Wahring and to a lesser degree Tahbilk and Kerrisdale, was the source of many thousands of Macquarie perch that were translocated across the state (Cadwallader, 1981).

At the time of European settlement in the Seven Creeks upstream of the Gooram Falls near Strathbogie, the only fish of angling size were Blackfish, though 'cod and bream' were caught in numbers up to the falls (Halsall, 1979). In early 1921, a public meeting was held at Strathbogie to make arrangements for the 'procurement of cod and bream' for release in the Seven Creeks (*Euroa Gazette,* 8 February 1921). During 1921-22, hundreds of cod and bream were transported from the Goulburn River at Cathkin, and the Seven Creeks between Euroa and Gooram, and released into the Seven Creeks at Strathbogie. By the late 1920s both species had become established, and the stream became well known for the cod fishery which existed amongst the many falls and rapids that characterise the creek (*Euroa Gazette,* 3 May 1921, 17 May 1921, 21 March 1922; Cadwallader, 1979).

John Langtry provided a brief account on the lower Goulburn River fishery c1950 reporting that it carried the best population of native fish in the state at that time. He relied on second hand accounts from fishing inspectors and anglers and reported that large numbers of Murray cod were being caught below the Goulburn Weir. Upstream of the weir Golden, Silver and Macquarie perch were present, as well as Catfish. He also stated that Macquarie perch were more abundant below the weir at that time, and that Redfin perch were particularly prevalent upstream (Cadwallader, 1977).

In 1969, Dr. Tim Berra and Prof. Allan Weatherly collected specimens of cod from the Seven Creeks as part of their study to determine if two cod species existed in the Murray-Darling Basin. They ultimately concluded that

there were two species, and that the Seven Creeks contained one of the last populations of Trout cod (Berra & Weatherly, 1972). Cod, including Trout cod, as well as Macquarie, Golden and Silver Perch were translocated above waterfall barriers in the Hughes Creek near Ruffy during the 1920s, and although subsequent captures occurred, they failed to establish (*Argus,* 30 September 1939; Halsall, 1979; Cadwallader, 1981; Cadwallader & Gooley, 1984).

In 1982, a detailed oral account of the fish present in the first quarter of the twentieth century on the upper Goulburn River and some of its major tributaries, was provided by angler R. D. (Bert) McKenzie. Bert, a long-time resident of the Ruffy area, and former secretary of the Ruffy Angling Club, lived next to the Hughes Creek, and retained knowledge of some fisheries in the catchment back to as early as 1908. The author and Colin Luker of *Native Fish Australia* met Bert quite by accident, and returned the following weekend with a tape recorder to record his recollections. These were subsequently published in *Freshwater Fishing* magazine (Trueman & Luker, 1992). Bert provided a compelling account of 'bluenose' (Trout cod) being common in the upper reaches of the Hughes and Seven Creeks upstream to major waterfall barriers. Bert recounted that in the 1920s 'bluenose' were present in the Big River above Eildon Weir, as well as being abundant in the Goulburn River between Thornton and Molesworth.

8.2 The Past Distribution of Fishes in the Goulburn River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the Goulburn River Catchment into a lowland zone (downstream from Thornton), a slopes zone (upstream to near Knockwood), an upland zone (upstream to near Woods Point) and a montane zone beyond the latter location. However, the use of these altitude-defined zones in the catchment provides an inaccurate description of the habitat. The changes in river morphology occur at lower altitudes than those in the Murrumbidgee catchment, which were used as the basis for defining habitat zones in the audit. The valley of the Goulburn is confined, with a relatively narrow floodplain dominated by coarse gravel substrates as far downstream as Seymour. These features are typical of slopes habitats elsewhere in the Murray-Darling Basin. Below Seymour, the river enters a wide floodplain with extensive billabongs, taking on the physical form of a typical lowland river. Upstream of Seymour, slopes-type habitat extends to the Eildon area where billabong habitats largely disappear. The river originally flowed through a much narrower valley with extensive exposure of bedrock, and delineating the start of the upland zone. In the following discussion, the lowland zone is defined as downstream of Seymour, the slopes zone downstream of Eildon to Seymour, and the *Sustainable Rivers Audit* definition of the upland/montane zone boundary of 700m ASL is retained.

Most of the historical research in this catchment concentrated on the Goulburn River and its tributaries upstream of Nagambie. Limited research was undertaken in the lower reaches of the catchment, and additional research to locate oral, written and photographic records of native fish in this area is warranted. Much of the information presented is sourced from an extensive oral history (mainly OH 114-132), supported by information recorded in the journals of early European explorers, as well as a significant number of detailed newspaper accounts. A considerable number of old photographs of catches of native fish in this catchment have been located, including some excellent images of Trout cod.

8.2.1 The Montane Zone

Few historical accounts exist of the larger native fish species penetrating into the montane zone of the Goulburn River catchment. In-stream barriers in the form of waterfalls and steep gradients, prevented access to much of this zone. A newspaper article suggests that Blackfish were present and widespread, but were not

considered to be abundant (*Argus,* 20 January 1910). Cod and Macquarie perch in the early twentieth century were reported to have been present near the bottom of this zone up to a waterfall near the Dempsey gold mine at Gaffneys Creek (Mathews, OH 114), and probably reached a similar altitude in the nearby Goulburn River. This suggests that they probably had small incursions into the lower reaches of montane habitats where accessible.

8.2.2 The Upland Zone

Both cod and Macquarie perch were common in the upland zone of the Goulburn River at Knockwood in the early twentieth century, and in the middle Jamieson River upstream to Mitchells Creek up to the 1930s (*Jamieson Chronicle,* 14 November 1885, 10 December 1909; Mathews, OH 114). In the middle Jamieson River, Trout cod were taken, while in the lower reaches both types of cod were present. Cod were common in the Goulburn River near Jamieson, and in the early years of the twentieth century Trout cod were prevalent (Mathews, OH 114). Macquarie perch and Trout cod had been common in upland habitat in the Big River upstream to a waterfall barrier just above Enochs Point (Mathews, OH 114). Downstream near Taponga, Macquarie perch and Trout cod had been very common along with some Murray cod (Mathews, OH 114; McKenzie, OH 116 & 117; Stillman, OH 119).

In the Howqua River, Macquarie perch and cod were common upstream to at least the Sheepyard Flats area, and Max Mathews recalled that his father referred to the cod as 'bluenose', a name he also applied to Trout cod, which Max witnessed him capture in the nearby Goulburn River (Mathews, OH 114). Frank Moore recalled the capture of cod and perch in the Howqua River at Tobacco Flat (Moore, OH 115). In the Delatite River, cod were very common at Maintongoon (Forsyth, 1899), with fish as large as 57 lb. (25.9 kg) being taken near Bonnie Doon (*Argus*, 28 April 1874). In the 1930s, Trout cod and Macquarie perch were abundant in the Delatite River near Bracks Bridge, with Murray cod being commonly caught in this area as well (Mathews, OH 114). Photograph 8.1 dates from c1900 and shows of a catch of cod and Macquarie perch taken in the area, it may well contain images of both cod species (State Library Victoria H96.82/4, pi000763).

Cod and Macquarie perch were present in the Delatite River at least as far upstream as between Piries and Delatite (Moore, OH 115). When the original Eildon Weir filled in the early 1930s, Murray cod and Macquarie perch were abundant, and one of the people interviewed suggested that Trout cod were also present near the inflowing rivers (Mathews, OH 114; McKenzie, OH 117; Stillman, OH 119).

To the west, cod and perch penetrated into upland-type habitat in the King Parrot Creek. The 'cod and bream' translocated from the upper King Parrot Creek to the Yarra River catchment via the Plenty River in 1857 were sourced upstream of Hazeldene. In excess of 60 cod and 37 bream were collected in three trips, indicating that cod and Macquarie perch must have been common at that time (Wilson, 1857; *Argus,* 10 March 1928). The species of cod that was present is unknown, though ultimately both Murray cod and Trout cod established populations in the Yarra River (*Argus,* 8 September 1898). 'Bream' are recorded in a newspaper account as having once been present near Kilmore at the top of the Great Dividing Range, suggesting that Macquarie perch were also present in the area (*Argus,* 27 October 1929).

Blackfish were widespread and very common to abundant in the upland zone. Many small streams near Kilmore contained Blackfish, including the headwaters of the Sunday Creek (*Argus,* 27 October 1929). They were also abundant in the Seven Creeks and its tributaries on the Strathbogie Tableland (Halsall, 1977, 1979), as well as being common in the Howqua River (Mathews, OH 114; Moore, OH 115), the Big River at Taponga and Enochs Point (Mathews, OH 114). Prior to the First World War, Blackfish specimens taken from Hughes

Creek near Ruffy were up to fifteen inches in length (*Argus*, 1 January 1918), as well as being found in small creeks near Terip, Ruffy, Dropmore, Caveat, Tarcombe and Kobyboyn, along with 'silver minnows' (McKenzie, OH 118; *Argus*, 1 January 1918). Eels have been recorded in the upper reaches of the King Parrot Creek (*Argus,* 16 January 1917) and Acheron River (*Australian News for Home Readers,* 20 February 1867). One account suggests that Pygmy perch (*Nannoperca australis*) may have been present in a tributary of the Delatite described as 'Homes Creek', probably Howes Creek, near Mansfield (*Argus,* 6 March 1908). Overall, the historical evidence suggests that Blackfish and Macquarie perch were originally abundant in the upland rivers, with Trout cod being very common and Murray cod also having a significant presence.

8.2.3 The Slopes Zone

Cod were abundant in the slopes zone of the Goulburn River between Eildon and Seymour (*Argus*, 31 October 1849; 7 January 1902, 13 December 1923; *Alexandra Times*, 21 August 1868). They were also very common in some of the tributary rivers in the slopes zone. In the Acheron River cod were said to 'abound', and were found at least as far upstream as Buxton (*Argus*, 29 January 1867, 26 December 1922; McKenzie, OH 116; Kerr, OH 120. They were also common in the Rubicon River being taken up to 16 lb. in weight from that stream (*Alexandra and Yea Standard,* 29 January 1897, 24 December 1909; McKenzie, OH 116). Cod were recorded in the Yea River by Hume and Hovell (Bland, 1831), and newspaper accounts reported frequent captures of cod (*Yea Chronicle,* 27 February 1908), with one in 1898 stating that 'cod up to 25lb. weight being frequently landed from the Yea River, while lighter specimens are obtained in large numbers from the Murrindindi River' (*Argus,* 20 October 1898). They were common in the upper Yea River at Glenmore Station near Glenburn (*Yea Chronicle,* 27 February 1908).

Cod were also abundant in some of the larger creeks, including the Hughes Creek as far upstream as Dropmore and the Seven Creeks at Gooram (*Argus,* 1 January 1918; McKenzie, OH 116 & 117; Bain, OH 121; Jones, OH 128) *Euroa Gazette,* 30 April 21, 17 May 1921; McKenzie, OH 116 & 117), where one account records two anglers catching 30 lb. (13.6 kg) of small cod in an afternoon (*Argus,* 18 February 1915). They were also common in the Connellys Creek upstream of Acheron (Stillman, OH 119), the King Parrot Creek near Strath Creek (Bland, 1831; Bain, OH 121), and the Home Creek (Nicholson, OH 125). Small cod were very common in the Sunday Creek at Broadford (*Broadford Courier*, 22 January 1892; *Broadford Courier & Reedy Creek Times*, 15 December 1893) and it was reported that 'numerous' cod died at Broadford after a bushfire (*Argus,* 15 February 1890). They were also taken in the lower reaches near Seymour (Bell, OH 127). Cod were also common in the Sugarloaf Creek between Pyalong and Tallarook (*Broadford Courier & Reedy Creek Times*, 20 May 1904), with one angler in one day taking over 100 lb. (454 kg) of cod up to 28½ lb. (13 kg) each (*Broadford Courier & Reedy Creek Times*, 25 May 1906). Overall, cod were very common, and in some cases, abundant in lagoons along the Goulburn River, including some very large specimens (*Alexandra and Yea Standard,* 10 November 1877; Bell, OH 127; Stillman, OH 119).

Two individuals provided detailed accounts describing Trout cod as being far more common than Murray cod in the Goulburn River between Eildon and Trawool during the 1920s to early 1930s (McKenzie, OH 117; Bain, OH 121). A third person further supported their accounts (Bell, OH 126) and is provided from the oldest oral account recalling the species as being prevalent near Tallarook in the 1920s (Grattidge, OH 97). The presence of Trout cod in this section of the Goulburn River is confirmed by a museum specimen obtained near Thornton in 1960 (Berra & Weatherly, 1972; Photo BERRA7). Several high quality photos clearly record Trout cod captures at the time stated in the oral history at the 'Breakaway' between Thornton and Alexandra (State Library of Victoria, H2005.88 237-1), and near Molesworth (GR1-3) with lower quality images recording captures at Alexandra (GR22-23) and near Homewood (GR13).

In these random photographs from the 1920s, Trout cod appear to be prevalent and support the oral accounts on the abundance of Trout cod in the area. At Alexandra, Murray cod were very common in the larger, slower holes, with Trout cod being more prevalent in areas of moving water (Russell Stillman, pers. com.). Trout cod were also reported to be the prevalent cod species in the Acheron River, Seven and Hughes Creeks, though Murray cod were also taken (McKenzie, OH 116-118), and in the Yea River near Devlins Bridge (Hopkins, OH 122). The evidence points to Trout cod being abundant in the slopes zone upstream of Seymour, with Murray cod also being common, at least in the larger holes, with specimens up to 117 lb. (53.1 kg) being taken (Bain, OH 121).

Macquarie perch are reported to have been abundant in most habitats in the slopes zone. Newspaper accounts, supported by an extensive oral history, record 'bream' as being abundant in the Goulburn River at Thornton (*Alexandra Times*, 21 August 1868; McKenzie, OH 117), Alexandra (Stillman, OH 119; Photo GR22-23), Molesworth (*Argus*, 31 October 1867; McKenzie, OH 116-117) and Seymour (*Argus*, 31 October 1849; Bain, OH 121; Bell, OH 127). They were very common in the Acheron River, at least as far upstream as Buxton (*Argus*, 29 January 1867; Stillman, OH 119; Kerr, OH 120), in the Rubicon River downstream of Rubicon (*Alexandra & Yea Standard,* 29 January 1897), the King Parrot Creek upstream to near Hazeldene (Wilson, 1857; *Argus*, 8 November, 1910; Bain, OH 121), the Hughes Creek upstream to Tarcombe and Dropmore (McKenzie, OH 116), as well as in Connellys Creek near Acheron (Stillman, OH 119) and in the Sunday Creek upstream to at least Broadford (*Argus*, 15 February1890; *Broadford Courier*, 22 January 1892; *Broadford Courier & Reedy Creek Times*, 15 December 1893; Bell, OH 127). They were abundant in the Yea River (*Yea Chronicle,* 27 February 1908; Hopkins, OH 122), with good catches being taken at Glenmore Station near Glenburn (*Yea Chronicle,* 27 February 1908). There were also present in the upper reaches between Kinglake and Glenburn (*Argus,* 22 January 1918). It was reported that near Yea 'it was not uncommon for half a dozen decent bream to be landed during the heat of the day' (*Yea Chronicle*, 16 December 1909), and in one account 97 fish were taken by a party of anglers in one day (*Yea Chronicle,* 23 December 1915). Macquarie perch were very common in lagoons near Alexandra, Molesworth and Seymour (*Yea Chronicle*, 6 April 1893, 4 February 1897; *Argus*, 25 January 1915; Stillman, OH 119; Bain, OH 121).

A number of newspaper accounts describe 'bream and perch' being present in the Goulburn River, suggesting that more than one type of perch was present (*Argus*, 22 February 1848, *Yea Chronicle*, 6 April 1893, 4 February 1897; October 1867, 7 January 1902). Langtry reported the presence of Golden and Silver perch upstream of the Goulburn Weir c1950, though he relied on second hand information (Cadwallader, 1977). There is a single first hand oral account of Golden perch at the bottom of the slopes zone from 93 year old Collin Bell, who caught a few in his youth at Seymour, dating the report to the 1920s (Bell, OH 126). Second-hand accounts suggest that Golden perch may have been captured near Thornton (McKenzie, OH 117), and a few fish were taken from the Eildon Weir in the 1930s when it first filled (Mathews, OH 114). Russell Stillman, says he never a saw a Golden perch taken out of the Goulburn River near Alexandra until 2007, when he captured one himself. However, his father had indicated that prior to the First World War odd specimens were taken in this area (Russell Stillman, pers. com.). A newspaper account describes the species as having been fairly common at Seymour prior to the construction of the Goulburn Weir (*Argus,* 4 March 1913), but by 1911 they were so scarce that the presence of a dead specimen in the river at that location was considered newsworthy (*Argus,* 22 June 1911). A family oral history recalls that occasional Golden perch were taken in the middle reaches of the Hughes Creek, though Macquarie perch were prevalent (Wes Jeffries, pers. com.).

Silver perch were regularly taken at the bottom of the slopes zone in the Seymour area c1930 (Bell, OH 126). Russell Stillman in his lifetime did not see a single 'grunter' (Silver perch) caught near Alexandra, but recalled his father mentioning catching small numbers at intervals when he was very young (Russell Stillman, pers. com.). The rarity of Golden and Silver perch upstream of Seymour in the twentieth century may not be

indicative of their original abundance, as it has been suggested that the Goulburn Weir may have impeded upstream movement into this reach of river (*Argus,* 4 March 1913). There are early newspaper accounts of several types of perch or bream being regularly caught in small numbers in slopes habitat in the adjacent Campaspe catchment (*Argus*, 20 November 1908). The limited oral history suggests that both Golden perch and Silver perch were probably present, but relatively uncommon compared to Macquarie perch upstream of Seymour.

Oral histories record Catfish to have been very common in lagoons along the Goulburn River at Thornton (McKenzie, OH 117; Moore, OH 115), Alexandra (Stillman, OH 119), Molesworth (Moore, OH 115; Greg Dunkley, pers. com.), Tallarook (Bain, OH 121) and Seymour (Bell, OH 126), with these fish regularly taken from the Goulburn River itself (Stillman, OH 119; Bell, OH 126). Newspaper stories indicated that Catfish were the 'most numerous' fish caught in lagoons near Molesworth (*Yea Chronicle*, 6 April 1893, 4 February 1897). They were also present in lagoons adjacent to the Yea River (Evans, OH 90; Garlick, OH 123) as well as being in the Yea River itself (Moore, OH 115; McKenzie, OH 116; Garlick, OH 123; Hopkins, OH 122; Graeme Creed, pers. com.). Two photos record the capture of a Catfish at Alexandra, confirming the species presence in the slopes zone (GR22 & GR23). Blackfish were abundant in the Acheron River (*Argus*, 29 January 1867), and in lagoons adjacent to the river (*Argus,* 27 May 1927), as well as being found in the Rubicon River (*Alexandra & Yea Standard,* 29 January 1897), the King Parrot Creek (Garlick, OH 123; *Argus*, 8 November 1910), the Sunday Creek and tributaries upstream of Broadford (*Argus*, 22 October 1929), Whiteheads Creek and its tributaries near Seymour (Bell, OH 127; Ron Bell, pers. com.),the Goulburn River near Alexandra (Stillman, OH 119), Yark (*Argus,* 1 November 1929) and Seymour (*Argus*, 4 March 1913). They were also common in the Yea and Murrindindi Rivers (Garlick, OH 123; Evans, OH 90), as well as being abundant in lagoons and backwaters near Seymour (Bain, OH 121; *Argus*, 4 March 1913), Sheepwash Lagoon and other lagoons near Molesworth (Greg Dunkley, pers. com.; *Yea Chronicle*, 6 April 1893; *Yea Chronicle*, 4 February 1897).

8.2.4 The Lowland Zone

Cod were abundant along the length of the Goulburn River in the lowland zone with fish in excess of 120 lb. (54.4 kg) being taken (Hawdon, 1952; *Argus,* 5 January 1932; Cadwallader, 1977), and a fish of 190 lb. (86.2 kg) was found floating in the Goulburn Weir (*Argus,* 4 August 1953). In the major lowland tributaries on the eastern side of the catchment, such as the Seven and Hughes Creeks, cod were present in abundance with fish up to 56 lb. (25.4 kg) being taken. Even the smaller streams such as the Creighton, Castle and Faithfuls Creeks carried some cod (Halsall, 1979; McKenzie, OH 116-118). The western tributaries, including the Wanalta Creek and the Cornella Creek upstream to Ladys Pass near Heathcote, also contained good cod populations, including large fish (*Argus*, 28 January 1895), while creeks in the lower reaches such as the Warragul Creek near Stewarts Bridge also contained cod (*Argus*, 17 September 1929). There was an abundance of cod in larger swamps and lakes such as the 'Saltwater Lake' (Lake Corop) (*Argus,* 8 November 1881) and, after their construction and filling, the Goulburn Weir and the Waranga Basin had large cod, perch and Catfish populations, with the former supporting a commercial fishery (*Argus,* 3 December, 1914; McLeod, OH 130). Cod were also very common in lagoons (*Argus,* 1 January 1923).

The oral history suggests that at least since the 1930s Trout cod, while present, were taken in comparatively low numbers in the lowland reaches of the Goulburn River compared to upstream. They were caught between Seymour and Nagambie (Bell, OH 126; Bell, OH 127; Jones, OH 128; McLeod, OH 130), and at Murchison (Polkinghorne, OH 131), Shepparton (Trefall, OH 132) and near Stewarts Bridge (Laddie Clifford, pers. com.), but in all cases were described as less common than Murray cod. The main exception are the eastern tributaries such as the Hughes and Seven Creeks, where oral history suggests that Trout cod were abundant,

and Murray cod were present (McKenzie, OH 117 & 118). The recent (post 1930) oral history recalling a scarcity of Trout cod in the lowland Goulburn River contrasts with their recent successful reintroduction to the section of river between the Goulburn Weir and Murchison East, where they became common (Trout Cod Recovery Team, 2008). A newspaper article from the early 1920s describing the fishing in Lake Nagambie makes specific mention of the capture of 'Murrumbidgee trout', implying that they were not uncommon (*Argus*, 17 December 1921). Similarly, Bert McKenzie's recollections of small Trout cod being common in the faster areas of the irrigation channels near Shepparton in the 1920s, also implies a significant early presence (McKenzie, OH 117 & 118). Collectively the evidence, though limited, suggests that Trout cod may have originally been fairly common in the lowland Goulburn River, and were abundant in some tributaries.

The Goulburn River at Tahbilk and at Wahring just below the Goulburn Weir were the source locations for the translocation of thousands of Macquarie perch to other waters in the state (Cadwallader, 1981) clearly indicating that they were abundant. A feature article in the *Argus* on catching Macquarie perch at Wahring, estimated that on the opening morning of the season in 1921, three quarters of a tonne of Macquarie perch was angled from just one location (*Argus,* 3 December 1921). In the 1940s, Macquarie perch was one of the most abundant species in the Goulburn near Murchison and Shepparton (Fisheries and Wildlife Division Inspector Jim Crozier, pers. com.). Anglers recalled the species to have been very common at Tahbilk (Moore, OH 115), Murchison (Polkinghorne, OH 131; Hanley, OH 129), Shepparton (Trefall, OH 132) and near Stewarts Bridge (Laddie Clifford, pers. com.). They were abundant in some lowland creeks including the Seven and Hughes Creeks, and had a significant presence in the smaller tributaries such as the Creighton, Castle, Faithfuls and Majors Creeks (Halsall, 1979; McKenzie, OH 117 & 118; Moore, OH 115). Macquarie perch were very common in billabongs near Murchison (Polkinghorne, OH 131), and near Kyabrum 'bream, grunter and perch' were captured (*Argus,* 26 February 1918) implying that three perch species were present, including Macquarie perch. They were also present in large numbers in the Goulburn Weir and the Waranga Basin after their construction (*Argus*, 17 December 1921, 17 January 1923; McLeod, OH 130). A news article recorded that 'bream' were abundant in Lake Corop (*Argus,* 8 November 1881).

An early account originating prior to the construction of the Goulburn Weir, recorded the deaths of large numbers of 'perch and bream' in a lagoon at Nagambie (*Argus*, 9 April 1878). In 1895 out of a catch of 50 fish taken at the base of the Goulburn Weir only three were Golden perch the rest being 'bream' (*Euroa Advertiser*, 25 October 1895) but they had been 'very plentiful' in the Seven Creeks downstream of Euroa (*Euroa Advertiser*, 5 January 1917). Graeme McLeod recalled his father stating that Golden perch, while present, had not been very common at Nagambie c1920 (McLeod, OH 130). A newspaper account indicated that occasional captures were occurring in the lake in the 1920s (*Argus,* 17 December 1921). During translocation activities in the 1920s, Golden perch comprised about 5% of the perch captured from the Goulburn Weir (Cadwallader, 1981). Further downstream, Golden perch were abundant at Murchison, Shepparton and Stewarts Bridge (Polkinghorne, OH 131; Trefall, OH 132; Laddie Clifford, pers. com.). A newspaper article suggested that prior to the construction of the Goulburn Weir, Golden perch had been relatively common upstream (*Argus,* 4 March 1913). The overall evidence suggests that Golden perch had a modest presence at the top of the lowland zone, but steadily increased in numbers downstream, to become abundant downstream of Murchison.

A newspaper article in 1922 reported that one fish in 500 netted in the Goulburn Weir were 'grunter' (*Argus,* 28 July1922), and during translocation activities in the 1920s, Silver perch comprised about 2.5% of the perch captured from the Goulburn Weir (Cadwallader, 1981). A newspaper account recorded that Silver perch were taken just below the Goulburn Weir in the 1920s (*Argus,* 3 December 1921). Oral history records that Silver perch were present, but uncommon in the Goulburn Weir in the 1920s (McLeod, OH 130). However, at times they were very common in the river and lagoons near Murchison (Hanley, OH 129; Polkinghorne, OH 131). At

Shepparton, they were present in such numbers that they were considered to be a pest (Trefall, OH 132). They were also abundant in the Goulburn River at Wyuna (Bell, OH 127) as well as being present in the Seven Creeks near Euroa (Halsall, 1979) and in the Waranga Basin (*Argus*, 17 January 1923). It appears that, like Golden perch, Silver perch also progressively increased in abundance downstream from Seymour.

Catfish were common in lagoons near Northwood and Tahbilk (Jones, OH 128; Hanley, OH 129), near Murchison (Polkinghorne, OH 131), and were described as 'plentiful' in lagoons near Toolamba (*Argus,* 18 November 1919) and 'abundant' in lagoons near Shepparton (Trefall, OH 132). In the Goulburn River itself, they were common at Mitchelton and Tahbilk (Jones, OH 128; Moore, OH 115) just below the Goulburn Weir (*Argus*, 3 December 1921), Majors Creek (Moore, OH 115) and the Warragul Creek near Stewarts Bridge (*Argus*, 17 September 1929). Catfish were abundant in the Goulburn Weir after it was filled, and it was recorded that on crosslines Catfish outnumbered the cod catch (*Argus*, 27 December 1921). Other accounts confirm that large numbers of fish were present (*Argus*, 21 October 1908; McLeod, OH 130). They were also present in irrigation channels near Shepparton (McKenzie, OH 117-118) and in the Waranga Basin (*Argus*, 17 January 1923). Overall, Catfish were abundant in static habitats such as billabongs, as well as being found within the river.

Blackfish were common in lowland creeks, including the Seven, Hughes Creeks, Creighton, Castle and Faithfuls Creeks (Halsall, 1979; McKenzie, OH 117-118), the Wappentake Creek near Costerfield (*Argus,* 1 February 1924) and the Warragul Creek near Stewarts Bridge where some large specimens were taken (*Argus*, 17 September 1929). They were also common in irrigation channels near Shepparton (Trefall, OH 132). Blackfish were also regularly taken from the Goulburn River in small numbers (Jim Hanley & Don Polkinghorne, pers. com.) and from Lake Nagambie (*Argus,* 13 December 1921). Bony Herring were present near Shepparton (Trefall, OH 132), and newspaper accounts reported their presence in lagoons near Kyabrum , as well as being in the Goulburn River at Wahring (*Argus,* 23 January 1923, 3 December 1921). Two accounts record Lampreys, probably Short-headed lampreys (Lintermans, 2007), being taken from the Goulburn River in the Shepparton area (*Argus,* 7 April 1917, 6 May 1927), and Captain Cadell, one of the early pioneers or river navigation, observed a seal in the lower Goulburn River (*Hobart Mercury,* 8 May 1865).

8.2.5 Estimates of Native Fish Abundance in the Goulburn River Catchment at European Settlement.

Presented are the rarity scores used in the *Sustainable Rivers Audit* (Davies *et al.,* 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardised survey techniques such as electrofishing. They are compared to those developed in the *True Tales of the Trout Cod* Project which uses more recently obtained historical evidence and is based on the typical size of angler catches in the oldest accounts.

Table 8.1 Goulburn River Catchment Rarity Scores (Main River Channels)

	Lowland (downstream of Seymour)		**Slopes*** (Seymour to Eildon)		**Upland*** (Eildon to 700m ASL)		**Montane†** (upstream of 700 m ASL)	
Species	**SRA**	**True Tales**	**SRA**	**True tales**	**SRA**	**True Tales**	**SRA**	**True tales**
Trout cod	3	3	3	5	3	3		L1?
Murray cod	5	**5**	3	**3**	0	U1		0
Golden perch	5	**L5**	3	1	0	0		0
Silver perch	3	**L5**	0	1	0	0		0
Macquarie perch	3	**5**	5	**5**	3	**U3**		L1?
Catfish	5	**3**	0	1	0	0		0
'Blackfish'	3	3	5	**5**	3	**5**		L3

Key
0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type supported by multiple accounts or lines of evidence e.g. oral history, newspaper accounts, photographs

* Note: Some of the boundaries used for this zone are at a lower altitude than those used in the *Sustainable Rivers Audit*

† Note: The expert panel did not develop a set of species rarity scores in the montane zone in this catchment for the *Sustainable Rivers Audit.*

Figure 8.2 **Historical Records for Murray cod and Trout cod in the Goulburn River Catchment**

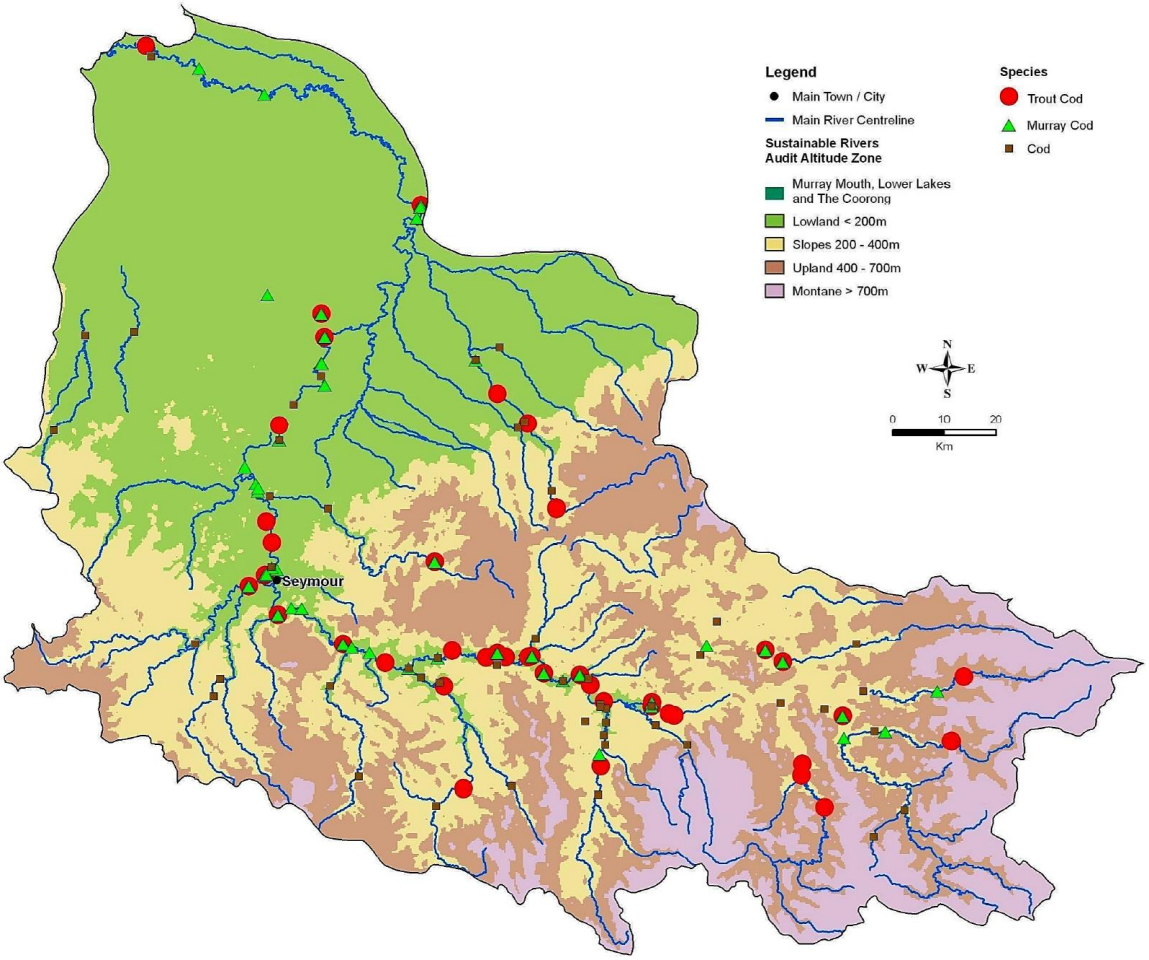
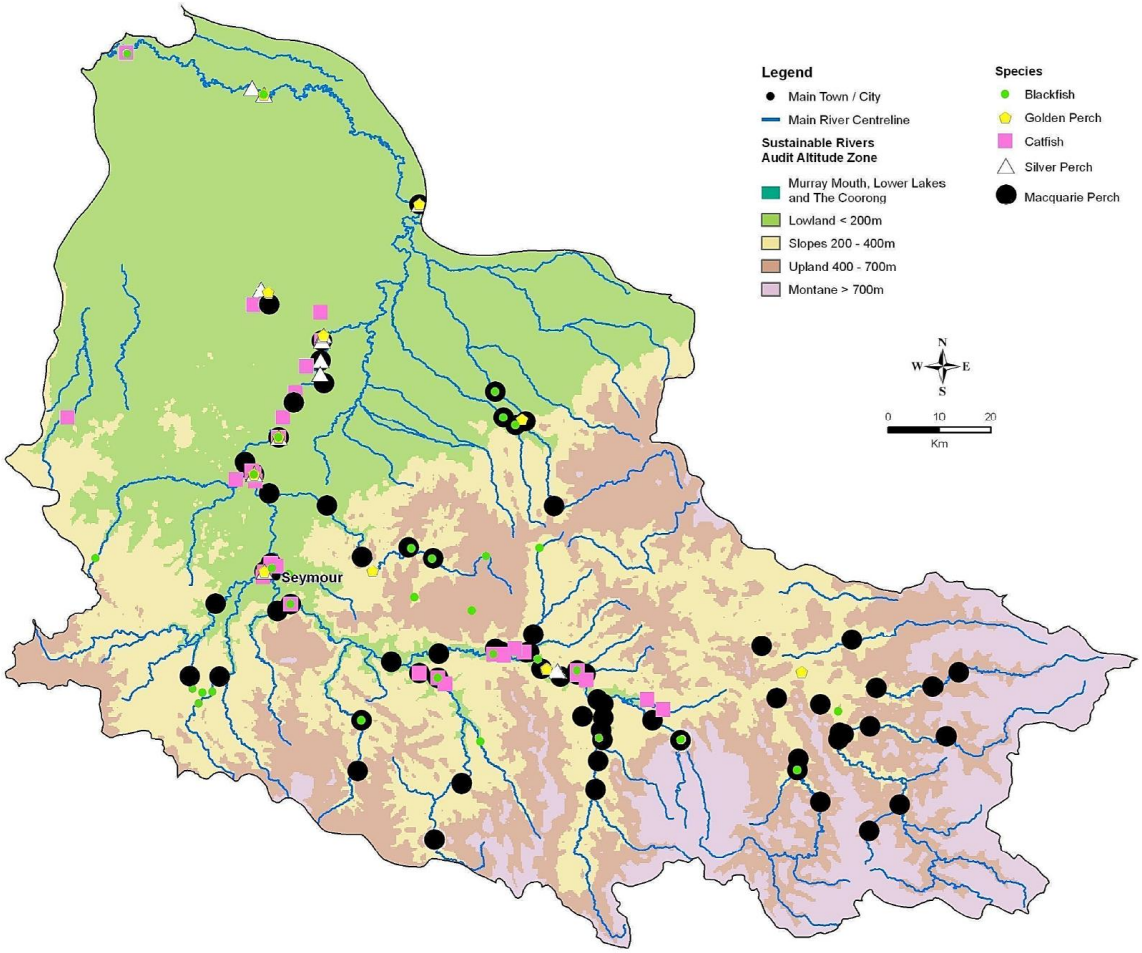


Figure 8.3 Historical Records for Native Fish Species other than Cod in the Goulburn River Catchment



Photograph 8.1 An Upland Catch

Photo: State Library of Victoria, pi000763. Left: This photo is of a fishing party including Robert Forsyth Jnr. (back row, right) at Rosebank Farm on the upper Delatite near Howes Creek c1890-1910. The catch includes Macquarie perch and cod, probably both Murray cod and Trout cod. The fish held by the gentleman on right has a caudle peduncle covered in black dashes, the markings extend onto the belly, and the shape and proportion of the head all suggest it could be a Trout cod

Right: A close up of the fish in the box. It contains Macquarie perch, identified by their large scales and white eyes and a cod (bottom right), which has a straight head slope and is covered in spots and dashes, which is possibly a Trout cod. Max Mathews of Jamieson recalled the Delatite River to have once contained an abundance of 'bluenose' and Macquarie perch with Murray cod also being regularly captured. The photo demonstrates that cod and Macquarie perch were once abundant in the upland rivers of the Goulburn River Catchment. Photo from the collection of Robert Forsyth Jnr., reproduced with permission of the *State Library of Victoria*.

Photograph 8.2 Eildon Macquarie Perch

Top: Photo GR31. Part of a catch out of the original Eildon (Sugarloaf) Weir near Italian Gully by Ray Deal, Olly Johnson, Les Stillman and Russell Stillman from 10 am to 3.30 pm about 1930. In the photo are 61 Macquarie perch, 2 trout of about 8 lb.(3.6 kg) and a Murray cod. Large catches of Macquarie perch in later years on their spawning migration out of Lake Eildon into the inflowing rivers were legendary with catches at times being measured in tonnes. This photograph demonstrates that in the early years the Macquarie perch fishery in the weir was prolific.

Bottom: Photo GR28. A catch of trout and two 3 pound (1.4 kg) Macquarie perch caught on a Devon spinner at Savage's Flat, old Eildon Weir by Russel Stillman c1938. The lady on the left is Jane Mitchell. Both photos courtesy of Russell Stillman.

Photograph 8.3 Slopes Habitat in the Goulburn

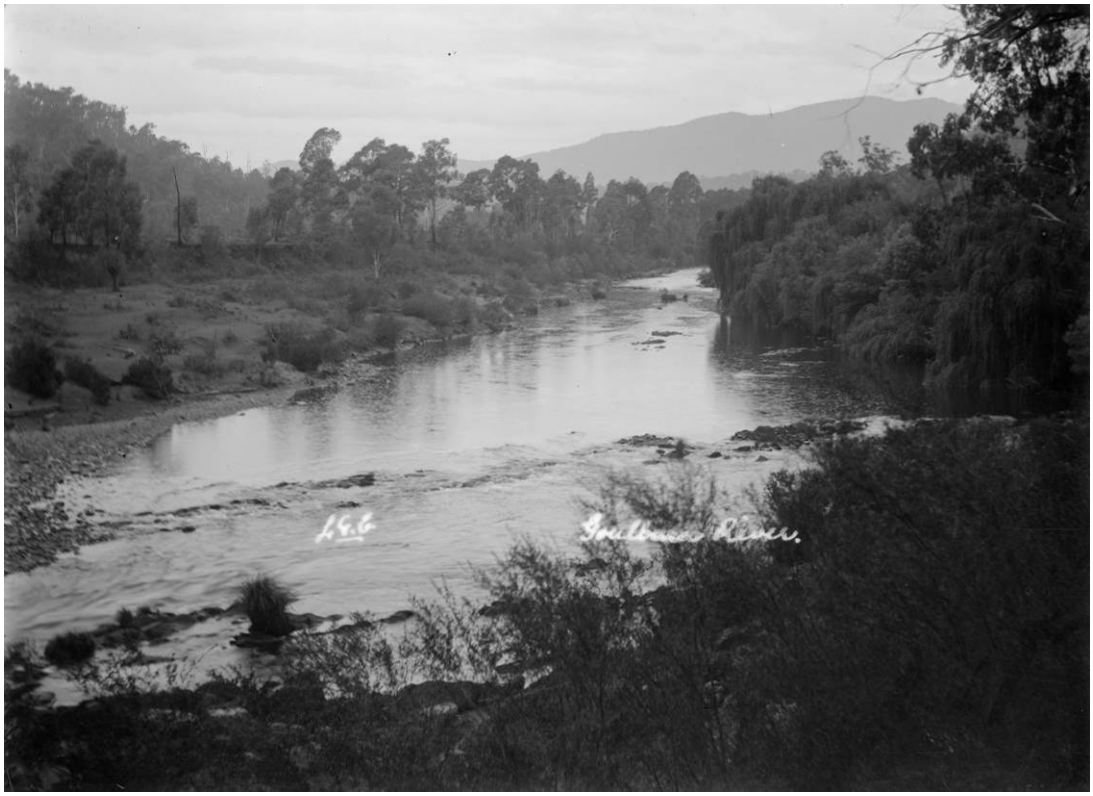


Photo: State Library of Victoria, lc000065, H2005.88/66. This image taken by Lindsay Cumming records the Goulburn River between Thornton and Alexandra as it was around the 1920s. The *Sustainable Rivers Audit* classified the river in this area as being in the lowland zone though the habitat in the Goulburn River as far downstream as Seymour has all the key features of slopes habitats as apparent in this image. Bert McKenzie described how in the 1920s 'bluenose' were abundant in the rapid waters of the Goulburn River near Thornton. The Lindsay Cumming image of the catch of cod, including Trout cod, originated from this area. Clearly in the past this was excellent habitat for Trout cod.

Photograph reproduced with permission from the Lindsay G. Cumming collection, *State Library of Victoria.*

Photograph 8.4 Trout Cod on a Pole

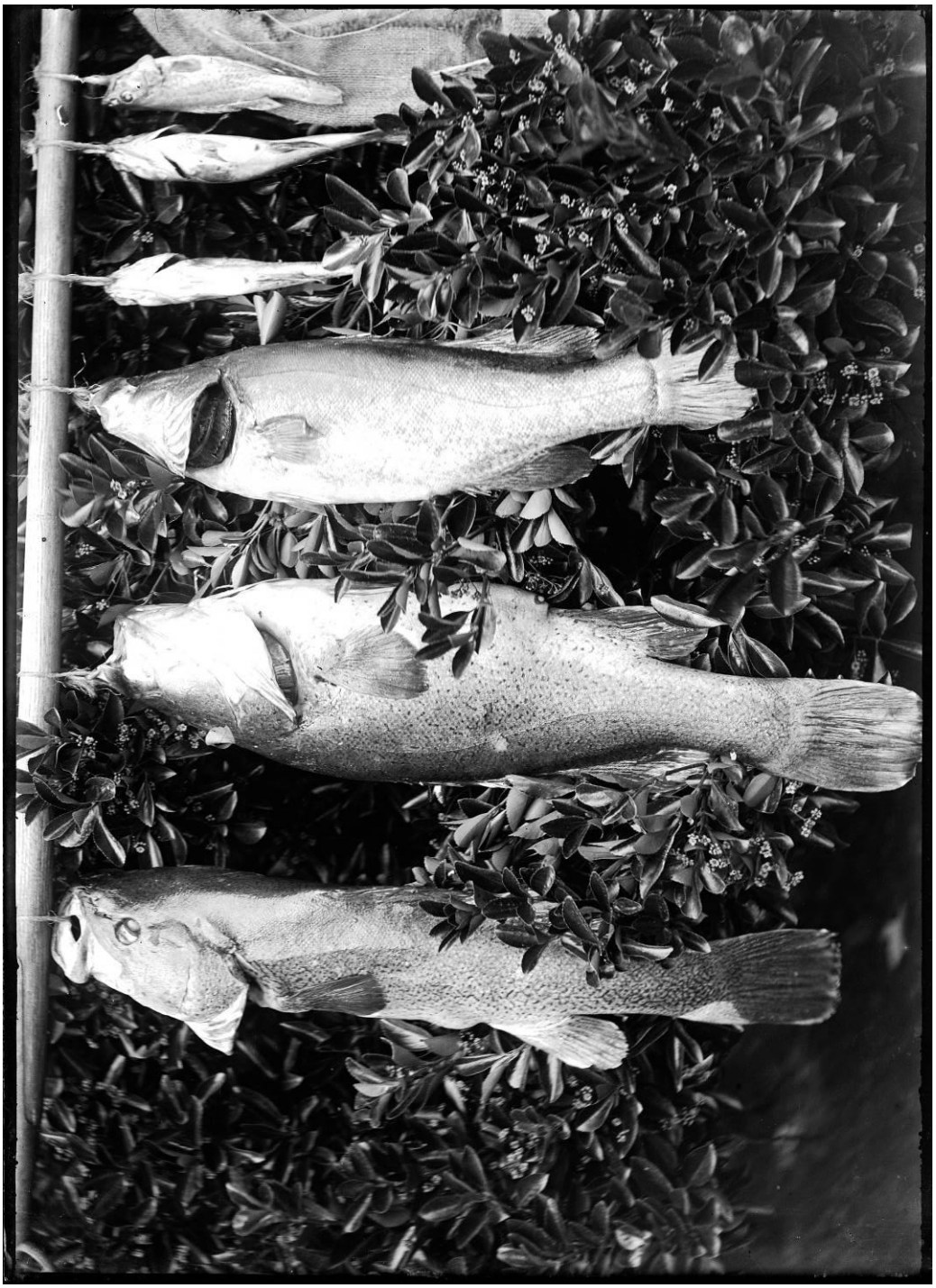


Photo: State Library of Victoria, H2005.88 237-1. 'Fish hanging on hooks on a pole'. This photo is from the Lindsay G. Cumming collection of glass negatives held by the *State Library of Victoria*. Advice from Russell Stillman, who was a friend of Lindsay, was that the photo was taken between Thornton and Alexandra on the Goulburn in the early 1920s. All the fish are cod and there are three Trout cod in the image being the 1st, 2nd and 6th fish from left to right distinguished by their markings as well as other features. The other fish cannot be identified with any certainty. This photograph is absolute proof of the former abundance of Trout cod in the slopes zone of the Goulburn River as described by Bert McKenzie and Ron Bain. Photo reproduced with the permission of the *State Library of Victoria*.

Photograph 8.5 A Morning's Catch at Alexandra

Photo GR 23. Contained in this historic photograph are images of all the larger native fish species once common in the Goulburn River at Alexandra. Dating from 1924, young Russell Stillman is present with his father Les Stillman on the right who angled these fish in one morning at Magee's Beach. Also present is Hector George on the left and Dorothy Fitzroy (Hill). Quite a number of Macquarie perch are visible on the left readily identified by their large scales and protruding lips, with a single Catfish present between Hector and Dorothy. The catch contains a mixture of Trout cod and Murray cod, the former being most apparent in front of Dorothy with their overhanging upper jaws, long pointed snouts and eye stripes visible. Russell recalled this catch to be typical at the time. He informed the author that, while he believed that Trout cod were prolific in the faster stretches of the Goulburn River near Alexandra, Murray cod were common in the larger holes. The image on the right shows a close up of the Catfish from a second photo of this catch (GR 22). These are the only surviving images of Catfish from the middle Goulburn River. Photo courtesy of Russell Stillman.

Photograph 8.6 Two Trout Cod at Molesworth

Photo GR3. The late Bert McKenzie recalled stories of Trout cod dominating the Goulburn River between Eildon and Molesworth during the 1920s. One of his favoured fishing spots was *Prospect Hill* near Molesworth. In this photo a young unknown visitor to *Prospect Hill* holds two Trout cod caught from the Goulburn River c1927. The photos in the Perry collection validate Bert McKenzie's accounts for the Goulburn River confirming his familiarity with the Trout cod and his status as a reliable witness. Photo courtesy of Muriel Perry.

Photograph 8.7 Prospect Hill Trout Cod

Left: Photo GR1. Thomas Bryan, original settler of *Prospect Hill,* Molesworth, with three cod caught from the Goulburn River c1927. The fish on the right is definitely a Trout cod clearly identified by the body markings. The fish in the centre is problematic, having a bleached/mottled area on its flank through contact with the ground or the other fish. Spots still remain visible in the dorsal region and on the head. Right: Photo GR2. Two more cod taken from *Prospect Hill* during the 1920s. The body markings apparent in enlarged images indicate that both are Trout cod. Both photos courtesy of Muriel Perry.

Photograph 8.8 Homewood Cod Catch

Left: Photo GR13. A catch of cod from Bryant's property near Homewood in the early 1930s titled 'The Fish Kings'. On the right is Arthur Bryant while the person on his left is a member of the Draper family. The cod on the left exhibit strongly pointed snouts while those on the right appear to have overhanging upper jaws (two fish enlarged, Centre & Right). The overall impression from their morphology is that most of these fish could be Trout cod. This photo appears to support angler recollections that small Trout cod were abundant down to Trawool c1930. Photo courtesy Yvonne Finch and Ray Hopkins.

Photograph 8.9 The McLeod's Livelihood

DEC 1945-6 Season.

5 20. 9. 6. 5. 4. 4. 3
6 7. 6. 4
8 10
11 6
17 8
18 3. 2.
20 30. 22. 10. 7. 7. 5. 5. 3
23 30. 8. 7. 5. 4 ✓
29 20. 7.
30 6.
31 8. 7. 7. 7. 6. 4. 13

JAN 1946

2 13. 6. 5. 3. 2
3 17. 6. 5. 4. 7. 5. 4

1945-6. Season.

13 8. 5. 5. 3
14 7. 7. 4. 4
15 24. 7
17 17. 6
19 16
20 5.
21. 9. 8. 8. 8. 8. 7. 9
22 6.
24 9. 7. 5

FEB 1946

2 7 100 cod
6 8. 6. 8
9 11. 4
10 3. 6. 8. 9.

Top: Photo GR65. Commercial fishermen Andrew (left) and Graeme McLeod with two Murray cod caught from Lake Nagambie c1940. The McLeod's had no need for nets, angling cod as a livelihood.

Bottom: Photo GR70. Part of Graeme McLeod's fishing diary commencing in December, 1945. The figures record the weight in pounds of individual cod. The lake once supported a superb native fishery containing an abundance of Murray cod, Macquarie perch and Catfish, with some Golden and Silver perch and Trout cod. Both Photos courtesy of Graeme McLeod and Wally Cubbin.

8.3 The Changes

8.3.1 Changes to Native Fish Distribution and Abundance

In the montane zone, Blackfish declined in abundance early in the twentieth century (*Argus,* 20 January 1910) while cod and Macquarie perch had disappeared from Gaffney's Creek by the Great Depression (Mathews, OH 114). In the upland zone, Macquarie perch and cod have not been reported in newspapers or by anglers from the upper King Parrot Creek upstream of Hazeldene in the twentieth century. By the 1930s, a significant decline in the abundance of cod and Blackfish had occurred in the Jamieson, Big, Howqua ad upper Goulburn Rivers (Mathews, OH 114). After the filling of the original Eildon Weir sometime in 1930, Murray cod were abundant, though by the 1940s they had become relatively scarce (Moore, OH 115; Stillman, OH 119). By the 1950s, cod were rarely taken from the upland rivers (Mathews, OH 114; Moore, OH 115). After the filling of the enlarged Eildon Dam in 1956, there was a substantial, but short lived expansion of the Macquarie perch population in the lake, though they still remained scarce in the rivers, except on their annual spawning migration (McKenzie, OH 117; Mathews, OH 114; Stillman, OH 119). Less than a decade after the enlarged Lake Eildon began to fill, small Macquarie perch had virtually disappeared from its waters, and most of the fish caught on their spawning migrations were large, old fish. Macquarie perch were effectively extinct in Lake Eildon by the late 1960s (Cadwallader & Rogan, 1977).

In the slopes zone, Golden perch had become rare near Seymour by 1913 (*Argus,* 4 March 1913), and there are no reports of either Golden perch or Silver perch in this zone after the early 1930s. Trout cod rapidly declined in abundance in the Hughes Creek after a major flood in 1916, and were rare by the end of the 1920' (McKenzie, OH 117-118). Macquarie perch and Trout cod were abundant in the Goulburn River between Eildon and Trawool until the late 1920s. In 1928, cod were described as being 'numerous' at Thornton (*Argus,* 15 August 1928), while in the same year two anglers near Seymour caught 21 'large bream' averaging 2½ lb. (1.1 kg) (*Argus,* 19 September 1928). By the middle 1930s, Trout cod were scarce, and fewer, larger cod of both species were taken. Macquarie perch were still taken regularly, but in much smaller numbers with good catches being described as 'practically only a memory' (*Argus,* 21 August 1937; Stillman, OH 119; Russell Stillman, pers. com.; Ron Bain, pers. com.; Garlick, OH 123; Morris, OH 124). Attempts at collecting Macquarie perch at Kerrisdale in 1933 for translocation resulted in the capture of only 24 fish (Cadwallader, 1981). Cod and Macquarie perch also declined in the Acheron River after the 1920s, and had vanished by the 1950s (Kerr, OH 120).

Catfish underwent a serious decline in abundance, becoming scarce by the end of the 1930s (*Argus*, 10 December 1929; Bain, OH 121; Bell, OH 126; Bell, OH 127; McLeod, OH 130; Russell Stillman, pers. com.) with occasional captures near Seymour and in the lower Yea River into the early 1950s (Jones, OH 128; Graeme Creed, pers. com.). Small cod had become very scarce near Seymour and Alexandra by the 1950s (Bell, OH 127; Stillman, OH 119), and by the 1980s the cod fishery near Seymour had declined to the point where anglers no longer fished for them, with rare captures taking place upstream (Hanley, OH 129). The last reported capture of a Trout cod occurred at Big Hill near Thornton in 1960 (Berra, 1974). In the 1940s, Macquarie perch were rare near Seymour (Bell, OH 127) and uncommon at Cathkin, Alexandra and in the Yea River (Garlick, OH 123; Russell Stillman, pers. com.). By the 1970s, they had disappeared from the Yea River (Ray Hopkins, pers. com.), and were rarely taken near Ghin Ghin (Hanley, OH 129). By the 1990s, they were rarely taken at Trawool, and a relic population remained in the lower reaches of the King Parrot Creek downstream of Flowerdale (Authors pers. obs.).

In the lowland zone, cod had become scare by the 1930s in the lower reaches of the Seven Creeks (Cadwallader, 1979). Murray cod were very common in the Goulburn Weir into the 1940s (McLeod, OH 130),

but by the 1950s, juvenile cod had become scarce between Seymour and Nagambie (Jim Hanley, pers. com.). A noticeable decline in catches of cod had also occurred in the Goulburn River downstream of the Goulburn Weir by the 1960s (Don Polkinghorne & Laddie Clifford, pers. com.). In the late 1920s, many hundreds of Macquarie perch were captured on several occasions near Wahring and Tahbilk for translocation, however, by 1934 only a few dozen were being taken (Cadwallader, 1981), and the species disappeared near Murchison and Shepparton during the 1970s (Hanley, OH 129; Polkinghorne, OH 131; Trefall, OH 132). Catches of Golden perch and Silver perch declined in the lower Goulburn by the 1960s (Jim Hanley, Don Polkinghorne, Ken Trefall & Laddie Clifford, pers. com.).

Catfish underwent a decline by the 1930s (*Argus*, 10 December 1929), but were still regularly taken in the Goulburn Weir until the 1940s, when a further decline was evident (McLeod, OH 130). Captures of Catfish continued in the Goulburn Weir until the 1980s, after which they were rare (Wally Cubbin, pers. com.; Author's pers. obs.). By the 1950s they had become scarce in the lower Goulburn River and billabongs (Don Polkinghorne, pers. com.). Occasional captures of Catfish occurred in the Cornella Creek in the 1990s (Author's pers. obs.).

8.3.2 Changes to Habitat

From the 1850s onwards, extensive land clearing occurred throughout the Goulburn catchment (GBCMA, 1999) and these activities eventually led to serious silting problems in the northern half of the catchment with the Hughes Creek filling with silt after a flood in 1916 (McKenzie, OH 117-118). Other granite creeks suffered the same fate, the process continuing up till the present time (Davis & Finlayson, 2000). The silting of the middle Hughes and Seven Creeks was a major factor responsible for the decline of native fish populations in those streams (McKenzie, OH 117-118; Cadwallader, 1979). The gold rush also had a major impact on the aquatic environment, particularly in the upland zone in the Jamieson and upper Goulburn Rivers where extensive alluvial workings occurred (Flett, 1979). Hydraulic sluicing and bucket dredging occurred in the Jamieson area from 1907 onwards, though was not used as extensively as in the Ovens catchment (Victorian Government 1907). The 1939 bushfires impacted upon the catchment with increased silting of the rivers and the Eildon Weir (Cadwallader & Rogan, 1977). In the lowland reaches of the Goulburn River de-snagging work was carried out to make the river navigable by paddle steamers at least as far upstream as Seymour. Extensive de-snagging took place in the Shepparton area during the mid-1870s (Mudie, 1961) and near Murchison in 1878 (Warwick Finlay, Murchison Historical Society, pers. com.) and some de-snagging occurred between Nagambie and Seymour in 1879 (*Australasian Sketcher*, 30 August 1879; Mudie, 1961). During the 1930s, trees and snags were removed from the Rubicon River and UT Creek (*Argus,* 26 March 1936), and in the 1950s snags were removed from the Acheron River as part of flood mitigation works (Kerr, OH 120).

The Goulburn was the subject of one of Victoria's earliest attempts at an irrigation scheme, including the construction of the Goulburn Weir near Nagambie between 1887 and 1891. The weir diverted water to a downstream irrigation channel system and into the Waranga Basin, reducing flows in the Goulburn River to such an extent that it made passage of river boats difficult (Mudie, 1961). It was suggested that the weir was responsible for the loss of Golden perch upstream (*Argus,* 4 March 1913). Mass deaths of Catfish were reported in the weir at Nagambie during 1908, with a description of the moribund fish having a slimy growth over their eyes implicating a disease agent (*Argus,* 21 October 1908), and another large kill occurred during the 1920s (McKenzie, OH 117-118).

Towards the end of World War One, construction commenced on the original Eildon (Sugarloaf) Weir and was completed in 1927. In April 1929, part of the rear of the wall subsided, sparking fears of the structure failing

and flooding the Goulburn Valley. Further slippages occurred, and for next two years remedial work was carried out to the wall (*Argus,* 29 July 1930, 8 January 1931). While cod and perch populations flourished in the early years of the weir, a number of contemporary newspaper accounts reported that it had a severe negative impact on downstream populations of native fish. In 1927 when the weir was completely drained, cod and other fish died in their thousands. The water that was released was described as 'thick and turbid' and 'muddy' (*Argus,* 8 July 1927; 9 July1927; Russell Stillman, pers. com.). In 1929, a very large kill of cod occurred as far downstream as the Goulburn Weir, and this event may also have been associated with another draining of the weir for repair work (*Argus,* 24 July 1929, 20 November 1929, 10 December 1929). The poor quality of the water released in 1929 was linked to bushfire events the previous summer. These bushfires resulted in the deposition of nearly half a metre of silt in the weir, with the Goulburn being described as 'heavily burdened with a load of silty mud' (*Argus,* 6 April 1929). Pollution of water attributed to paper mills in Broadford generated an enormous fish kill in the Sunday Creek in February 1919 with the density of dead cod and perch recorded as 540 fish per half mile (*Euroa Advertiser*, 28 February 1919). After that time there have been few reports of cod or Macquarie perch in the Sunday Creek.

By the mid 1930s near Alexandra, Trout cod were rare, Macquarie perch scarce, and fewer larger Murray cod were taken (Russell Stillman, pers. com.). The *Argus* published a feature article entitled *Vanishing Fish: Goulburn River Mystery* and implicated one factor in the decline of native fish as being changes to flows in the river causing poor recruitment of native species, while favouring the proliferation of Redfin perch (*Argus,* 21 August 1937). Overfishing was also suggested as contributing to the decline of native fish in the Goulburn River (McKenzie, OH 117; *Argus,* 21 August 1937, 24 August 1937), as well as to the loss of Macquarie perch in Lake Eildon where at times catches of several tonnes per week were reported from the feeder rivers in the late 1950s (Cadwallader & Rogan, 1977).

Major kills of Macquarie perch and cod occurred in the Eildon Weir during the 1930s and were attributed to outbreaks of 'fungoid' diseases and 'white spot' (*Argus,* 18 December 1937; Stillman, OH 119; Trueman, 2007). The original Eildon Weir was subsequently enlarged by the Big Eildon Dam project in 1956, making it one of the largest impoundments in the Murray-Darling Basin. It dramatically altered the flow regime in the Goulburn River downstream, which also experienced significant thermal pollution. Summer temperatures were variously reported as being reduced from about 5 to 11 °C. This resulted in the failure over many seasons in the river between Eildon and the Goulburn Weir to reach the temperature thresholds for some species of native fish to spawn (Cadwallader & Rogan, 1977; Ryan *et al.,* 2001).

Trout were introduced to the Goulburn catchment in the Kilmore area in 1872, in 1881 into Snobs Creek, Little River near Taggerty, Fishers Creek near Narbethong, Taggerty River and the Delatite River, where they rapidly developed self-supporting populations (Ritchie, 1988). Early attempts to introduce trout to the Jamieson River were a failure, and it was not until just prior to the First World War that Brown and Rainbow trout became established (*Jamieson Chronicle*, 29 April 1910, 23 June 1911, 5 December 1913). Trout were introduced to the upper Seven Creeks in 1886, but did not develop into a self-supporting population, and had to be maintained by ongoing hatchery releases (Cadwallader, 1979; Halsall, 1979). The fish were also introduced into tributaries of the Yea River in 1898 (*Argus,* 20 October 1898), and were also regularly stocked into some lowland waters such as the Waranga Basin, where they were first introduced in 1908 (*Argus,* 25 May 1908).

In the slopes zone, trout had become abundant in the major tributaries by the end of the 1920s, and were common in the Goulburn River itself downstream to near Alexandra (McKenzie, OH 117; Stillman, OH 119; Kerr, OH 120). Downstream of Alexandra the river was marginal for trout, with only small numbers being taken from time to time. The construction of the Eildon Dam in 1956 changed this and trout became abundant to Yea, and regularly taken between Yea and Nagambie (Ray Hopkins, Ron Bain & Wally Cubbin, pers. com.).

The introduction of trout to the upper reaches of the catchment was associated with a decline in Blackfish populations (*Argus,* 20 January 1910) as well as negatively impacting on translocated cod and perch in the upper Hughes Creek (*Argus,* 30 September 1939). The decline of cod and Macquarie perch populations in upland areas was linked to the proliferation of trout, with evidence of predation of Macquarie perch and Blackfish (Mathews, OH 114). Cadwallader (1979) reported a negative correlation between the distribution of Trout cod and Brown trout in the upper Seven Creeks, and suggested that trout had played a role in the disappearance of the Trout cod population upstream of Polly McQuinns Weir. Keam (1994), relying on uncited anecdotal evidence, suggested that the Polly McQuinn Weir was responsible for the loss of the Trout cod population by inundating a breeding area. Polly McQuinn Weir was constructed in 1933, and the wall was raised slightly in 1949 (Halsall, 1977). However, trout cod remained common in the weir during the 1950s, with juvenile museum specimens being sourced from it in the 1960s (O'Connor, OH 111; Barnie Kipping, pers. com.; Berra, 1974), so the construction of the weir does not correlate with the disappearance of Trout cod. The weir was completely drained in 1962 and in 1963 was stocked with 3500 Brown trout yearlings (Halsall, 1977). The following year the upper Seven Creeks was stocked with 120,000 trout (Cadwallader, 1979). Trout cod have not been subsequently reported above Polly McQuinn Weir (Cadwallader, 1979).

In 1872, Redfin perch were first introduced to the catchment into two reservoirs at Kilmore (*Argus,* 2 March 1872). They were released into Lake Cooper around 1880 (*Argus,* 8 November 1881), and from 1893 were stocked in Goulburn River irrigation channels to control crayfish becoming established (*Argus,* 18 December 1893). By 1895, they were present in abundance in both Lake Cooper and the Waranga Basin (*Argus,* 11 February 1895; 3 December 1914). They were also released into the Seven Creeks at Euroa in 1903 (Halsall, 1979; Cadwallader, 1979), and local anglers released small numbers of Redfin perch into the upper reaches of the Seven Creeks during the 1920s. This time they failed to establish (Barnie Kipping, pers. com.). Redfin were also present in some farm dams upstream of Eildon prior to the 1950s (Mathews, OH 114).

At the start of the twentieth century, Redfin perch were widespread but uncommon below the Goulburn Weir, with the exception of the lakes near Rushworth. A specimen caught near Murchison in 1910 required assistance from a newspaper to help with its identification, and was obviously considered unusual (*Argus,* 16 December 1910), but by 1917 they were reported to be present at times at Wahring 'in thousands' (*Argus,* 31 August 1917). They were first reported at Seymour in 1911 (*Argus,* 5 May 1911), the following year were reported to be present but scarce in the Goulburn Weir (*Argus*, 2 December 1912), and by late 1926 only had a minor presence in the Weir (*Argus,* 28 December 1926). By the mid 1930s, they dominated the static waters of billabongs between Eildon and Nagambie, and the Goulburn Weir. The fish were very common in the river itself, and were associated with the decline of cod and perch populations (*Argus,* 27 October 1929, 10 December 1929, 21 August 1937, 5 November 1938; McLeod, OH 130; Bell, OH 126; Bell, OH 127). It has been suggested that Redfin perch appeared in large numbers after the filling of the enlarged Eildon Dam in 1956 and were one of the factors responsible for the subsequent decline of Macquarie perch (Cadwallader & Rogan, 1977). A newspaper account indicates that Redfin perch were proliferating in Eildon Dam in 1947, well before its enlargement (*Alexandra and Yea Standard*, 28 November 1947). Redfin perch increased significantly in abundance in the middle Goulburn River during the 1960s when they came to dominate the river between Alexandra and Shepparton (Stillman, OH 119; Polkinghorne, OH 131).

Goldfish were recorded as being present in the Murray River near Barmah by 1873 (*Mount Alexander Mail,* 26 April 1873) and are likely to have to been present in the lower Goulburn River after that time. Ongoing introductions took place, including Lake Cooper c1880 (*Argus,* 8 November 1881) and creeks near Violet Town during the late 1800s (Chambers, 1985). They were introduced into the Eildon Weir during the early 1930s to provide a food supply for other fish (Trueman, 2007). English roach were reported from the lower Goulburn

near Kyabrum in the 1920s (*Argus,* 23 January1923), and in the 1960s appeared in Lake Eildon where they established a large population (Cadwallader & Rogan, 1977). By the early 1970s, European carp arrived in the lower Goulburn River and eventually spread upstream to above the Goulburn Weir and to Lake Eildon (Cadwallader & Rogan, 1977).

8.4 The Current Situation

The Sustainable Rivers Audit concluded that 'the Goulburn Valley community had the equal-lowest Fish Index of all Valleys' of the Murray-Darling Basin, and that it in terms of the reference conditions for native fish that 'Extreme Differences prevailed in the Slopes and Upland Zones, and a Very Large (+) Difference in the Lowland Zone' concluding that:

> the Goulburn Valley fish community was in Extremely Poor Condition. Alien species were 63% of total biomass and 58% of total abundance. The community had lost most of its native species richness and was dominated by alien fish, mainly trout (Davies et al., 2008).

Bert McKenzie found it inconceivable that the prolific numbers of fish between Eildon and Seymour were now gone; a sad reflection on what was once Victoria's most important native fishery. With a handful of small exceptions, the populations of Trout cod, Murray cod and Macquarie perch that inhabited the slopes and upland zones are now extinct. The translocated Trout cod and Macquarie perch populations in the Seven Creeks persists between Polly McQuinns Weir and the Gooram Falls area, a relic population of Murray cod exists in the lower Delatite River, and relic Macquarie perch populations survive in the King Parrot and Hughes Creeks. The King Parrot Creek also contains good populations of River Blackfish in the lower reaches and Two-spined Blackfish in the upper reaches, the latter being the most westerly occurrence of Two-spined Blackfish. Translocations have also re-established small Macquarie perch populations in the Yea and Murrundindi Rivers and Lake Eildon. A relic population of Catfish exists in Tahbilk Lagoon, with occasional captures in the Goulburn Weir and the river downstream. Below the weir Murray cod, Golden perch and Silver perch have recovered to become common, though Macquarie perch are extinct.

From the 1980s, stockings have re-established a substantial population of Murray cod in Lake Eildon. Large numbers of Golden perch have also been stocked into the lake in an area where they were originally very rare. Trout cod were successfully introduced to the Goulburn River between the Goulburn Weir and Murchison during the mid-1990s with evidence of spawning and recruitment taking place (Koster *et al.,* 2004). A large fish kill which took place in January 2004 through uncertain causes (Perriss, 2004) impacted upon the population, though angler reports suggest that the population persists. Trout cod were also stocked into the lower Hughes Creek but failed to establish. Recent reports suggest that small numbers of Trout cod, possibly originating from the Hughes Creek stocking, are now present in the Goulburn River from Tahbilk to Molesworth.

The Black Saturday bushfires of February 2009 burnt out much of the headwaters of the catchment including the upper King Parrot Creek. A rescue operation was undertaken that resulted in 59 Macquarie perch being removed from the creek and housed in ponds at the Snobs Creek Hatchery near Eildon to prevent total loss of the population due to the anticipated reduced water quality. Since the fires, Macquarie perch have been detected as far upstream as Flowerdale, and there is evidence that the population has since reproduced (Ayres, 2009). The fish removed from the King Parrot Creek were returned in December 2009. A similar rescue operation was undertaken with Macquarie perch in the drought affected Hughes Creek, and with Barred galaxiids from some montane streams affected by bushfires in the Goulburn Catchment (Hames *et al.,* 2010).

8.5 Newspaper Highlights

Argus, 31 October 1849
A fish, weighing forty-three pounds, was caught by Mr. Smith, proprietor of the Seymour Hotel, about a week since, being the largest that has been caught in this neighbourhood for several years. The Goulburn abounds in fish, mostly cod and bream, also cray fish /

Argus, 29 January 1867
The Acheron abounds in a variety of fine fish—cod, black-fish, bream, &c.

Argus, 31 October 1867
We have received the following letter from our correspondent at the Palestine diggings. / I've fallen in love with these ranges. Besides, there's plenty of cod, and bream, and perch in the river, and lots of old 'covies' like him. I'm a sittin' upon to be got any day you like to go after them.

Alexandra Times, 21 August 1868
The lot of fish brought in from the Goulburn yesterday, to Messrs Hames and Asgbe's, was a treat to look at. There were two cod about 30 lb each, about a dozen smaller ones from 3 to 15 lb, and about half-a-dozen perch averaging about 3 lb each. There appears to be only one man employed in fishing at present. We imagine that there is plenty of room for another, as it is scarcely possible that one can supply the whole township.

Argus, 28 April 1874
Country News. / Says the Mansfield Guardian:- "We have had the opportunity of seeing a very fine fish of the cod species, on Thursday. It would appear Messrs. G. G. Clarke and Son have been prospecting for some time in the vicinity of the Devil's River, about 12 miles from Doon. / Upon being weighed it turned the beam at 57lb. Its length from snout to tail was 3ft. 8in., and the circumference at the shoulders 30in. / in the Devil's River the oldest resident in this district has never heard of one being hooked before that weighed near 57lb."

Argus, 9 April 1878
Country News. The Goulburn Valley Advocate states that on April 1 thousands of fish were caught in the Nagambie lagoon. It is thought that they found their way into the lagoon from the overflow of the Goulburn river during the late fresh, and were not able to return. They consisted chiefly of bream and perch.

Jamieson Chronicle, 14 November 1885
Another of the sporting expeditions which occasionally rally forth from Jamieson, took place on Saturday afternoon last, but this time the pleasure seekers were not after game, but displayed a number of fishing rods sticking out from behind the dray / and made a start early on Saturday afternoon, arriving safely at the fishing ground – just below Bryce's, on the Goulburn – about four, and, we are informed, a start was made to fish, with the result that by the time it got thoroughly dark, some nice bream had been bagged. / We are informed that some fine fish were on the lines and amongst them a cod of 15 7/8 lbs. / we saw the large cod, and though we also saw the whole of the fish, weighed – and they amounted to 40lbs. weight – still we did not see them actually taken from the water.

Argus, 15 February 1890
Country News. Broadford, Friday. Large numbers of fish in the Sunday Creek, which flows through the township of Broadford, have been sickened by the flow of burnt grass and ashes which were washed into the creek by a storm which broke on Wednesday over the area burnt by the late bush fires about four miles above

the township. Hundreds of fish could be seen swimming down stream on top of the water endeavouring to escape from the black inky-looking fluid. All sorts of weapons were brought into requisition to catch them with, such as garden-rakes, pitchforks, buckets, waddies, &c. Several large cod 10lb. and 15lb. in weight were shot with guns, 6lb. and 7lb. fish being quite numerous. Some splendid bream 2lb. in weight were raked out of the water. Crayfish in large numbers crawled up the banks and on to logs.

Broadford Courier, 22 January 1892
Fishing in the Sunday Creek. – Notwithstanding all that is said, fish do evidently manage to exist below the Paper Mill. On Wednesday morning Messrs. Eaton and T. Marchbank spent a very profitable hour and a half mile below it during which they succeeded in hooking out some 30 lbs of fine cod and bream, the largest weight 8 pounds. The anglers attribute their luck principally to the peculiar condition of the atmosphere prevailing at the same time. Another party caught 30lbs the same afternoon near the same place and they state there was practically no limit to the quantity obtainable.

Argus, 28 January 1895
The Rodney Fisheries. That the Cornella Creek contains some fine fish Mr. J. Furphy proved to his own satisfaction a few days ago by landing one of 38lb., two of 36lb. each, and one of 35lb., or an aggregate of 145lb. weight for four fish.

Argus, 11 February 1895
A Fishing Haul. Rushworth, Saturday. T. Williams and P. Spence had some splendid fishing on Lake Cooper on Saturday afternoon, they securing no less than 443 English perch, weighing 1cwt. 3qr. 5lb. A company of five from Rochestor also managed to catch 227lb.

Yea Chronicle, 4 February 1897
Molesworth. / Fishing seems to be good just now about here, and I am more than surprised that some of your numerous ardent disciples of the sport do not try the lagoons. They are nearly always certain to yield fair sport – catfish, known as Murray ling, being most numerous of course, but I have seen some fine specimens of bream, blackfish (small) and perch got out of them.

Argus, 20 October 1898
Trout For The Yea River. / Already good fish are caught in the district, cod up to 25lb. weight being frequently landed from the Yea River, while lighter specimens are obtained in large numbers from the Murrindindi River.

Argus, 7 January 1902
Alexandra, — Messrs. T. Wood, A. E. Stillman, and H. Johnson, fishing in the Goulburn River, near Thornton, on Friday, caught upwards of 120lb. weight of fish, chiefly cod, bream, and perch, being the biggest day's haul this season for three lines.

Argus, 21 October 1908
An extraordinary mortality is occurring among the catfish in the Nagambie Lake, and at the last meeting of the Goulburn Shire Council it was stated that for half a mile along the lake frontage people could not approach because of the awful stench. It was stated in the Rushworth "Chronicle" that thousands of these fish have been stranded on the shore, and whilst many have been lifted out as many more have sunk to the bottom of the lake. "Stacks of dead fish have been piled up on the bank and covered with lime, and these will be burnt. A greater number of catfish have died that a person would estimate the lake contained of all descriptions. One authority says the fish have died from what is known as 'white disease'. This causes a scum to grow over the eye of the fish (only catfish have been affected so far), and this brings on blindness. The fish then die of starvation.

Jamieson Chronicle, 10 December 1909
Several good hauls of bream and codfish have been made from the Jamieson and Goulburn rivers, near the township, since the opening of the season, on Wednesday, the 1st inst. This is accounted for the fact, that the close season has been enforced for the last few years.

Argus, 5 May 1911
Perch In The Goulburn. Mr. R. V. Ramsay, of Seymour, writes: - "An uncommon fish was caught last week in the Goulburn by Mr. E. Jones, a local angler. It was about 12in. long, weighed 3½lb., and had black stripes across the back, with golden-coloured fins and tail, and a mouth smaller than a bream, which it somewhat resembled. Anglers do not recollect a similar fish being caught in these waters."

Argus, 22 June 1911
Sheep Rescued in Boats. Seymour, Wednesday. / The flotsam and jetsam of the flood comprise small fish and a few snakes. Included in the fish caught was a golden perch weighing 10½lb. This is the first golden perch seen here for many years.

Argus, 2 December 1912
Good Fishing. Seymour. / What is believed to be a record catch for the district was taken from the Goulburn weir / When they ceased fishing on Sunday evening they had caught over 3cwt. of cod and bream. Included in the haul was an English perch of about 4lb., caught by E. Jaensch. This is the first perch caught in the district for some time.

Argus, 4 March 1913
Goulburn Fishing Queries. "T.C." writing from Seymour, says:- "Golden perch used to be plentiful in the Goulburn, but none are caught now. Local residents say none have been caught since the weir was constructed at Warranga. / 3. A little fish is caught in most still waters about the Goulburn called a blackfish. It never exceeds a few ounces".

Argus, 25 January 1915
Lagoons Drying Up. Seymour, Sunday. – The continued dry weather is having a serious effect on many of the lagoons in this district, which are now drying up. As the result, fish are dying in large numbers. At what is known as "the Shepherds Hut" lagoon, near the town, numerous fish up to 8lb. have been found dead. This lagoon has never been known to dry before. At Maher's lagoon many bream, all over a pound weight, have died.

Yea Chronicle, 23 December 1915
The Fishing Season. Further good catches are reported. Mr J. McIntosh of "Glencoe," Whittlesea road, Yea, reports the he and his party grassed 97 bream and 5 cod fish aggregating 140 lbs., and Mr Stan Oliver and party, 17 bream and several small cod, aggregating 50 lbs in all.

Argus, 5 January 1916
Boat Trip on Goulburn. / They launched their boat above the Acheron River, beyond Alexandra, and proceeded downstream to Seymour, a distance of about 160 miles. / In all 88 cod were secured, the weights ranging from 2¼lb. to 18lb., as many as 18 being caught in a mornings fishing.

Argus, 18 November 1919
Catfish. “New Chum” (Toolamba) is wholly astray as to the merits of catfish. / If, as “New Chum” says, catfish are very plentiful in the lagoons about Toolamba, they need never go short of fish.

Euroa Gazette, 3 May 1921
Another link to the district’s history was added on Saturday, 23 rd April when, through the agency of the local Anglers Club, the first consignment of Murray Cod and Bream was liberated in the Seven Creeks. A party of ten anglers made the trip to the Goulburn river at Cathkin and by means of light hooks and a lot of hard work secured a nice lot of young fish ranging in weight from two pounds down to three inches in length. They were transferred by means of special cans (supplied by the Fisheries Department) and arrived in good condition with no losses. Several members again tried their luck below the Gooram Falls on Saturday last but, so far the result is not known.

Euroa Gazette, 17 May 1921
Those fishermen who tried for young fish below the Gooram falls on April 30th were fairly successful and brought back about fifty nice little cod and bream which were duly liberated. On the same day, Mr. E. Charman of Euroa, promised to try also and two fish cans were sent to him. He secured about a dozen fish, seven of which were well grown, and bream quite large enough for the fry pan.

Argus, 17 December 1921
The Spinner’s Lake. A Nagambie Waterfront. / But the mixed fisher – perhaps the majority – who welcomes the smaller cod, the Macquarie perch, or an occasional “golden belly” / Many of the Nagambie fishers – like those of the Murrumbidgee – maintain that there are at least two species of cod in these waters – the one narrow in the snout and more trout-like in shape, the type called Murrumbidgee trout; the other, blunt-nosed and of heavier build, which they identify as Goulburn and Murray cod. These distinctions, at once noticeable in a big bag, were long ago investigated by the late Professor McCoy/

Euroa Gazette, 21 March 1922
On Saturday (11th inst) a party of three car loads from the local anglers club went to the Goulburn at Cathkin for the purpose of securing further supplies of young cod and bream for liberation in the Seven Creeks. As a result about 200 young fish were safely transferred to the government fish cans which had been lent by the Fisheries Department. A few nice sized cod were also taken and the party had an enjoyable outing.

Argus, 28 July 1922
Murray Bream. / Mr. W. McLeod, of Nagambie, should, Mr. French thinks, be able to clear up the confusion as to which fish was netted there for introduction into the Yarra. In netting, they would probably not get more than one silver perch or grunter to 500 of the other species, and he has heard the grunter misnamed Murray bream all through the Goulburn Valley.

Argus, 8 July 1927
Fish in Goulburn River. / Thousands of fish have died in the Goulburn river below Sugarloaf weir. For miles down from the weir fish of all sizes up to 56lb. are to be seen dead from either bank, and the small fish have died in thousands. / T. H. Carter, Thornton.

Argus, 9 July 1927
Since the water in the weir has been released and the huge basin drained hundreds of dead fish have accumulated in the river around the outlet pipe of the weir. It is surmised that these fish became caught in the current of water passing into the outlet pipe and were then forced through the control dome and release

valves, where they were suffocated by the muddy water in the river below. Some very large fish have been killed, some of the cod being 30lb. in weight.

Argus, 17 September 1929
Goulburn Blackfish. Referring to a note on the insignificant northern blackfish called "slimey," S. Musselwhite (Koyuga) says:- "I have got them in Warragul Creek, which empties into the Goulburn just above Stewart's Bridge. The best fish I have seen caught weighed 1lb. 11oz. A good many ranged from 1lb. 4oz. to 1lb. 6oz." "This creek also teemed with English perch. I got four weighing 5lb. each, also catfish, cod, and carp.

Argus, 22 October 1929
Blackfish And Slimeys. Contributing his experiences to the discussion on this subject, J.E.C. (Hawthorn East) says that it brought back to him many pleasant recollections of his boyhood days, which were spent in Kilmore. / We used to fish in the Dry Creek and the Railway reservoir in Kilmore East, and Sunday Creek, between Kilmore East and Broadford. In all these streams we got the blackfish which you now call slimeys. In the Kilmore reservoir, near the hospital—then the only water supply for the town—we got slimeys, bream, and perch. At Logie's dam, a few miles to the west of Kilmore, we got very large perch in some of the holes from the overflow. These overflow holes were, however, quickly fished out every season." / "All that was 42 to 46 years ago."

Argus, 10 December 1929
I am told about the Nagambie weir and other parts of the Goulburn where so many Murray cod are being found dead the redfin are numerous, and while the stream was still closed for the native fish large bags of redfin were being got, with fish up to 3lb. and 4lb. in weight. Only this week I heard an expert prophesy that in the course of years the redfin will take complete possession of these northern streams. / I asked a Goulburn River angler about catfish, last week, and his opinion was that "something had happened to them." Because they are now few and small. I have seen some very fine ones taken out of the pool at the foot of Nagambie weir on the opening day of the season, and wonder whether a thinning down of the catfish has been noticed by fishers in other parts of the Goulburn.

Argus, 18 December 1937
Murray Cod Fishing. / It was reported by two delegates at the Piscatorial Council's meeting that Macquarie perch ranging from 1lb to 4lb were found floating in the Delatite and Goulburn arms of Eildon weir. The fish were numerous and in a helpless condition, and at first sight appeared to be injured. When taken from the water they died immediately. There were marks not unlike scars on the fish. As the fish rapidly decomposed it was thought that they were afflicted with a fungoid disease.

Argus, 5 November 1938
Anglers. / From the lagoons between Molesworth and Alexandra Mr. E. T. Gardiner and party at the week-end caught 138 English perch up to 3lb. on yabbies and worms.

Alexandra and Yea Standard, 28 November 1947
At the close of last season's fishing in Eildon reservoir Jack Burness and Bill Higgs observed a new type of minnow, to which they pointed out to me and which I recognised as a small Red fin. For confirmation, these fish were sent to Mr. Butcher and he recently confirmed my fears by letter to Jack Burness. Red fin (English perch) are now in Eildon reservoir in countless millions. Eildon has in the past put up with all kinds of abuse, but I am afraid this will be the final blow to the reservoir fishing. C. R. Lyne.

8.6 Goulburn River Catchment Oral Histories

The following oral histories (OH 114-132) mostly discuss the Goulburn River Catchment.

OH 114

Max Mathews of Jamieson was interviewed in November and December 2006 at an age of 82 years. Max provided additional thoughts and memories in January 2007 before passing away in February 2007.

I'm the oldest one left in the town. The others, 87, 90, 93, they're all gone, I'm the last. Born in this house in 1925, with a midwife. I got the knickname 'Darb' off an old aboriginal bloke, his name was Darb. I left in 1960 to educate my kids, went to Melbourne, then came back. Still got a house there in Croydon. In the rivers around Jamieson were the cod, silver bream, black bream and the slimies. The silver and black bream were crosses of the same, Macquarie perch. I saw my father catch cod; some were on the saddle, with their tails on the ground. That was out of the Goulburn here, and out of the Howqua. Back in those days a horse was the only way you could get around. You could catch the big cod on parrots. We used killed sheep's heads that were fly-blown to attract the cod. Hang them over the water, the maggots brought them in. My father did that. Then you would use the parrots for the big ones. The smaller ones wouldn't touch it. For them you would get them on the crabs for bait.

In the Goulburn I caught cod up to the one mile peg, not much past there, as far as I know, didn't go much up there. The older people talked about a lot of cod caught around Knockwood before the lake first filled. There was a waterfall on the Goulburn there, just up past Dempsey mine, past Trentfield's house[1]. The cod and bream didn't get past there. The Goulburn is a cold river up there, through the forest it runs in shade. And there weren't many deep holes, the cod needed them. Maybe the mining filled the holes, I don't know. The Jamieson was different, I fished it a lot. It was warmer, a lot warmer; it had lots of sun, and plenty of deep holes. The cod and the bream they went right up to the start, up to Mitchells Creek. I used to go up there mustering, about when I was 14. They went up that far, caught plenty there, but they couldn't get up the 11 foot waterfall [2]. Later on when they were put in, some of the trout made it up there, past the falls. The bigger ones did, the rainbows used to climb better than the spotted. Laurie Hoskins and I used to fish it a lot. His father had the homestead there.

My father grew up at Aberdale Station, up at Sheepyards Flat, on the Howqua. My grandfather was up there too. The Howqua was the same, in fact it had more cod and bream in it than just about any of the other rivers around here. They were all the same, full of the cod, silver and black bream, and the slimies. They used to catch big cod right under the Howqua Bridge. Further up the river, at O'Leary's, there was a lot of sticks and timber, and I used to get a lot of the silver bream and the black bream up there. Around Jamieson the cod, you could catch them all year round. In the winter, anytime. They bit well in spring, in the spawning season, but then they brought in all the rules about 1934, like they had for the trout, so you had a season on them then, you couldn't fish for them. The biggest cod I caught in Jamieson was 27 pound at Kewshwin's Hole, Frank Galbally the solicitor was with me, though when I was a kid I saw 50 pounders caught. I saw Mark Foots and Webby Foots catch them. The biggest cod I saw was caught by Max Sullivan, out of the Delatite in 1943, it was 108 pound, it was in Nolan's butchers shop for months. He caught that below Brack's Bridge, it took him three hours to land it. He thought he was going to run out of line!

The other type of cod the bluenose was caught in Jamieson. Very different head, looked like a cannibal, different colour and markings, a long dark nose that was blue, like the name, and marked different. My father showed them to me first, when he caught a couple that were 15 pound. They were caught up to 20 to 25 pound, but they were tougher to eat. They were not that common in the Goulburn here as far as I remember,

not as common as the Murray cod. My father told me that they used to be very common in the Goulburn here, the most common cod caught, before the weir got built. Maybe the weir affected them; the still water might have helped the Murray cod move up here. They were a lot faster than the Murray cod. The Murray cod liked the big holes in the river here; there weren't many big holes past here in the Goulburn. With the Murray cod it was a case of keeping the pressure constant on them, bring them up and burst the air sac. But I had a bluenose straighten a hook out, near Kewshwin's holes.

My father-in-law, Percy Newman, was born on the Big River, one of four brothers, they were all born there. He showed me the old wheel tracks of where they used to go in and out, bringing in the flour and other things. It was cleared then, you wouldn't know it now. They grew oats in there in one spot. There are trees now as wide as the wheel tracks! That's near where the Taponga comes in, at the Taponga junction. Showed me where the old antimony mine was. He talked about catching lots of the cod, the bream and the slimies, there were no trout in the river back then. He talked about a lot of bluenose, in the Big River, they handled the faster water. That was back before the weir went in. The cod, bream and slimies went all the way up to Enochs Point; I caught them there, the bluenose, plenty of them! And there was heaps more there when Percy was young. When I was a kid I saw them slip over the rapids, moving between holes. That was right, the bluenose and the bream were so common there.

The bluenose were more common, very common in the Delatite, than in the Goulburn in Jamieson, it was a smaller river. That's where I met my wife. I caught cod below where Brack's Bridge is on the Delatite up past the main road. That's near where Newman's house was Bracks Bridge; they moved over there from the Big River, my wife's a Newman. They were all good fishermen. There were bream there too, the Murray cod and the slimies. The cod high up the Howqua and Jamieson might have been mostly bluenose too, but I was a kid back then, it's a long time ago. My father talked about them up at Sheepyard Flat as bluenose, but I can only just remember them being cod. I think there were plenty of bluenose up at Mitchells Creek too, I remember some of the fish, though I am sure we did get some Murray cod closer to Jamieson. But in the Big River and the Delatite well there was heaps of them, definitely.

The black and silver bream were all through here. The silver bream, there were a lot around 9 to 10 inches long, but when I was a kid I caught a hell of a lot of the black bream around a pound and a half. They were crosses of each other and different sizes. They were very fat, but had awful fins, could do some damage. They used to come up the river out of the weir, yes, heard the stories about them stopping the stage coach. In the new weir, well they came out of it and up the river; they used pitchforks to fish them out. Had my neighbor, Henry Brooks, borrow a pitchfork! He was throwing them up on the bank. My dog Darkie, he could smell them, he was trained to find them, then he would bark like buggery, gospel truth! Poor old Darkie, he is dead now, but he could find them. When there were the big runs out of the new weir, even the people could smell them. In different years they went to different holes, one year at the hole at the junction, the next year to Italian Camp on the Goulburn, the next year they were in the swimming hole in the Jamieson.

I've got pictures of them building the old weir, that's from 1916. It only backed up the water up to Peechy's Bridge at Darlingford, on the Goulburn. There was a lot of cod caught out of it after it filled. There were no yellowbelly or Catfish caught here in Jamieson, though a few yellowbelly did come out of the old weir early on. In 1933 they started putting a lot of brown trout in. Up at Laidlaws Road, up past the cemetery there was a working bee, that's where they made the hatchery. There was Dick Dale; he paid for it, John McCormick, 'pop' Hoskins and my dad John Mathews. Dad didn't too much on it, he leant them his scoop, showed them how to use it. They built a dam, lined it with saplings, had trays to hatch the eggs. They did everything themselves, had to use the bush materials, what they had. They released them there. Later on they brought in the rainbows.

When they let the trout go, when they were let in they were a cannibal fish, well that eventually did away with the bream, and the slimies, in the rivers here, well mostly, though they were still in the lake. You would clean the trout and they would always have the slimies in them, and sometimes the bream. They were only little bream, about 6 inches long, but I did see a lot of them in the trout. I didn't see many small cod in the trout, maybe odd ones. They were full of small crays, and sometimes even birds. I was told there were trout in the river before the hatchery, but after the hatchery was put in the bream got scarce, saw them mostly when they came out of the weir. There were still big holes in the river then, down below here that suited them, but they became less common.

After the second weir filled there was just a few yellowbelly caught, they came out of the farm dams, along with the redfin. The State Rivers were going to poison the dams to kill the redfin, but the water came up too quick. It came up so quick there were water tanks, fuel tanks, even tractors floating around. The crabs weakened the walls with their digging and they let go, putting the redfin in. The redfin helped the cod and bream disappear. But the cod liked the running water with the big deep holes, and the weir covered most of them.

1. The Dempsey mine was located on the east bank of Ryans Creek, near its junction with Gaffney's Creek, about 600 m south west of the township of Gaffneys Creek.

2. The falls discussed by Max in the Mitchells Creek area have not been visited by the author. An examination of topographic maps suggest that they may be located approximately 2 km downstream of the junction of Mitchells Creek with the Jamieson River.

OH 115

Frank Moore of Macs Cove was interviewed in December 2006 at an age of 82 years.

I grew up early on in the Wimmera; my brother was 20 years older. We started off fishing the Wimmera area, later on moved on, fished quite a few other areas. Lived around Bonnie Doon, Barjarg, been in the Delatite area more or less since 1948, fished in and around this area before and since, just about every bloody inch of it! When I was a boy I used to see native cats, I'd get them in the rabbit traps, they gave me hell. I suppose I was one of those that knocked them on the head, but really what did them in was the change of conditions through intense farming.

When I was a kid we used to get big Blackfish out of the Sassafras Creek, that was about 1935/36, and I've caught good ones out of the top of the Dandenong Creek as well as nice ones at Wesburn and the Doone Reserve. I've caught them to 2 pound, maybe more out of the Brittania Creek. Norm McLeod and I used to give them buggery, blackies and trout, in the Tarago River. That was later, 38/39 right up till about 1948, apart from the war years. The biggest blackie was about 4 pound out of the Sassafras, my grandson got a good one last year in the Woori Yallock Creek near Macclesfield, about 4 pound. Norm and I used to get some good bags of them, from about 2½ pound to 4 pound from the upper Thompson, around 'Swindlers', 'Napping,s' and 'Bell's Flat', old mining towns. We would always get them in the evenings, from say 7 p.m. to about 11 p.m., and good bags too! Up to 20 fish, but then you could catch them in plenty of places. My dad and brother frequently caught them, as well as cod, in both the Yarra, and the Plenty River.

We used to get Catfish out of the lagoons along the Goulburn, when I was a kid in the mid 1930s, at Thornton, Alexandra, around Cathkin and Molesworth, no worries. Actually I've caught some out of the Yea River itself. They varied from 2 to 6 pound, we used to like eating them, they were as good as cod. My brother used to get a lot of bream at 'the breakaway'. We caught plenty of cod out of the Goulburn along there too. We camped out there at Thornton with Harold Sweeny, Jack Bliss, used to catch the cod and pack them in damp sawdust.

Harold used to get the cod frozen at Sennet's ice cream works. Once the cod had nearly thawed out we would get them sawn up into chops at the butchers. Old Dr. Box used to fish with us, he knew all about the two types of cod there. He could pick them from slight differences in the tail as well as all the other differences.

Jacky Stillman, born and bred at Crystal Creek, he cleaned a 27 pound cod and it had a 2 pound bream in it! Got a photo of him with a 23 pound cod out of the Acheron in 1938. He got it on a green tree frog on a hand line, next to Pat Noonan's place down towards 'the Breakaway'. I've caught cod in two foot of floodwater, pulling an aeroplane spinner over the paddocks. I've caught little ones, which were taken by the big cod! We used to get a lot of good cod out of the Delatite arm of the old weir. My father and my father in law Syd Moss caught heaps, lots of good ones.

I used to get the cod and the perch out of the Howqua. At the time they went up as far as the big holes below Tobacco Flat. The original Bridge at Sheepyard Flat had washed away once, and I used to go down through Whiskey Flat and at the end of Tobacco Flat is Weirs Creek. Down a little I caught the cod, downstream from Weirs Creek to Dry Creek. From Dry Creek down there were hellish big cliffs, and from there down there were some excellent holes. Mostly the ones I caught, I suppose a good one was 10 pound, mostly 7 to 8 pounds. We also caught what I called yellowbelly back then, though others called them perch (Macquarie perch). They were mostly a small fish, about a pound and a half, though I know blokes that got bigger ones up there. In the top of the Howqua 10 to 12 pound was the biggest cod. They didn't really go up further than those holes near where the cliffs were, not when I fished it. A few redfin and tench got up there too, and the slimies, well we used to catch a lot of them[1]. For the cod, we nearly always got them on scrubworms, though we used cockies breasts too. They probably bit at all the shrimps on it.

In the Delatite we got a lot of perch up to 3 to 4 pound, in the good holes, where there were 3 or 4 good bends between Piries and Delatite. You could almost always be assured of getting one. And the trout too, there were lots of them. We caught a lot of cod too, but not the big ones. The common size was about 8 pound, though we got broken off by bigger ones. In the Delatite, that was before the mid 1950s, before the new weir went in. The Delatite now is nothing like it used to be back then. The river was deeper and had much greater flow, maybe the flow was 25 times what it is now. It's changed all right, it used to be pretty much gravel and sand. A lot of it is now mud and big boulders. You look at it and it's not the same river any more.

In the Broken I caught the cod and the perch way up past Nillahcootie, up around Stockyard Creek, up from Barwite. It used to be a bloody good river, that was not long after the war. The cod weren't big; a big one was maybe 15 pound, with a few at 8 to 10 pound. You didn't catch a lot of them, didn't catch hundreds of them. During the season, in three days, you would catch maybe a cod, maybe not. The perch were about the same, you'd get one like the cod. They were up to 4 pound. Some holes were much more productive than others. But as the river shrank so did the fish, not just in weight but in numbers. Other places, well in the Indi we used to catch a lot of trout and in the pools the Macquaries. At Tahbilk in the Goulburn we caught lots of cod, Macquaries, lots of catties. And in the Majors Creek too I caught a cod once, perch and 3 or 4 nice catties.

The cod we got out of the Howqua and the Delatite well they were different to those in the old weir. They were a dirty sort of a grey colour, not like the ones in the weir which were a lot brighter green, the proper Murray cod. No they were like the ones we used to get in the Goulburn, like in the photo with Jack Stillman, the heads were different. Others called them bluenose or rock cod but they were just cod to me. I suppose they were all Trout cod in those rivers, different to the normal Murray cod. I feel really bad; people are going to blame me for wiping them out. But I honestly think it wasn't the fishing, it was what we did to the rivers. The native fish lasted so well until we came along. When I was very young we used to get lots of little ones, then they just disappeared. You would get the bigger ones, 8 to 30 pound, but the little ones were gone. They tried to turn the

rivers into channels, pulled out the snags. They tried to charge me a levy for pulling out the snags, but I refused to pay. And then the redfin and trout were put in, and later on the carp. We only kept the fish we needed to eat, so it wasn't the fishing. It was what we did to the rivers.

It's no use blaming what happened, in a lot of cases it was sheer ignorance, not knowing a new country. When you look at the rivers and see what's happened, well, they're not the same. I think we need to fix some of the rivers for the natives. One man can't make a difference, but a lot of men can.

1. Footnote: in a latter conversation Frank clarified that the redfin and tench were captured in the Howqua River after the filling of the enlarged Lake Eildon in 1956.

OH 116

The late Bert McKenzie of Ruffy was interviewed in July 1983 at an age of 83 years.

Bert McKenzie was interviewed by Collin Luker and the author after a chance meeting during July 1983. The interview was tape recorded, typed up and published a number of times in Freshwater Fishing magazine, most recently in 1992 (Trueman & Luker, 1992). Some original notes of his recollections recorded from the first meeting have survived and are presented below in point form. The following weekend during the tape recorded interview he elaborated on many of them but a few points were not discussed again. In particular these relate to fish in the Buffalo, Yea and Acheron Rivers and some memories of catches of trout. These points are included for completeness:

- *Caught Trout cod from the Hughes Creek at Dropmore in 1908 when 8 years old. Father called the fish a 'bluenose'.*
- *When he was young there was a pro in Avenel that used to catch heaps of bream and cod and send them to Melbourne*
- *Bluenose disappeared from the creek in the 1920s after it silted. Macquarie perch were still caught at Tarcombe, odd ones caught at Dropmore*
- *Biggest trout taken from Hughes Creek was 12 pound, used to get a lot fly fishing. Best catch of trout was 100 up to 7 pound out of Eucumbene*
- *In the 20s the angling club shifted cod, yellowbelly and bream from Nagambie and released then at Ruffy*
- *The Goulburn at Molesworth, Cathkin, Alexandra and Thornton was full of bluenose. Used to fish it with uncles in the 1920s.*
- *Yea, Acheron, Rubicon had a lot of bream and cod were caught. Big bream were caught from the Yea, and Catfish. Uncle fished at Glendale Road at Taggerty before the war (first) caught bream and a few bluenose there.*
- *The Big River had bluenose in it and a lot of bream, fished it from the weir up to the Jamieson Road*
- *Bluenose in the Goulburn were common from six inches up to about ten pounds, lots of small ones. By the war (second) the small bluenose and bream were gone, big cod were caught, mainly Murray cod.*
- *Biggest bluenose from Goulburn caught in the 20s was 20 pound. Later one or two up to 50 pound were seen. Biggest bluenose from the Murray at Cobrawonga Creek in 1944, weighed 66 pound. When bluenose get big covered in lots of small spots, like big Murray cod, head still different, snout sharp and longer than jaw, blue or grey/green sometimes black*
- *Caught bluenose from Buffalo River in the 30s. At Nug Nug caught both types of cod, up further cod were mainly bluenose*

OH 117

Below are the recollections of Bert recorded the following weekend (July 1983) for the Goulburn River system*: The cod were down in the Hughes Creek. When I was eight years old (1908 - WT), my father took me down on horseback and he caught some to four pounds that particular day. Bluenose cod they would have been, they were all bluenose down there, except one, a six pounder, I think was a Murray cod, a much deeper fish in the*

body than the bluenose. And little ones well they would tig tig tig away on the worms. I must have got twenty or thirty on that particular day though I only kept two that were over a pound in weight. Apparently the hole I was fishing in wasn't any good for bigger Trout cod. I had several trips down there that was about two miles above Dropmore Station. But everybody fished it; they were caught up to twelve pounds there and all on bait at that time. I don't think the aeroplane spinner had come in till about 1920. One old chap told me that it started from somebody crumbling up a jam tin lid and throwing it on a line with hooks on it. That could be hearsay. We would go down there on and off and we never came back without cod. But we never caught any bream there. The bream didn't get up further than Tarcombe.

The Trout cod was present in Hughes Creek up till about 1923-24. A flood had gone through the beautiful holes, stretches of them, I suppose as nice a creek as you could possibly have for Trout cod, you know, with deep rocky holes. There was a terrific rain storm up here and it took out every fence between here and Avenel and also cut a gutter from the falls down below here right through to Dropmore and into the Tarcombe area. And of course that probably did away with the breeding grounds that were down there. There would have to be a breeding ground there somewhere for them. That was the beginning of the end for them. They didn't last more than four years after that. Later on I brought seventeen Trout cod over from Gooram on the Seven Creeks and let them go in my dam over here. I put them into the dam to start off with but it burst and let them go into the Hughes Creek. They stayed around there for two years and I would only use a fly when I fished that area and I remember one little chap would come out from the water only about three feet deep and he would come out from under a ledge. I would throw a fly in and boom and then let him go again. He never learnt and would still get caught again. And another one further down got caught several times as well as others. I caught them on the red tag which seemed to be one of the best flies up here.

I caught a cod of six pounds down at Molesworth on the Goulburn River and I tethered him up down there and I put him in two wet bags to bring him home. I had the idea that I'd let him go in the creek and tethered him up in the pool in my paddock and he was lively as a cricket, so I released him. Whether he is still there in the stream or someone caught him I don't know. My parents rented a farm about six miles below Euroa and the Seven Creeks there was full of little bluenose and the Macquaries. One was caught that weighed fifty pounds and had a rabbit trap inside him. The poor rabbit must have pulled the trap free of the stake and fallen in the creek and the cod got him. I don't know whether that was a Murray cod or a Trout cod. I can't guarantee they were all bluenose as it didn't matter much at the time. Bluenose was the title we used for the Trout cod back in the twenties. That seemed to be commonly used bluenose cod and Murray cod. And they were all the way right up Seven Creeks to the Gooram Falls just as they were right up to the falls in the gorge of Hughes Creek. At Hughes Creek there was a whole series of steep falls up to ten feet high which they never negotiated. Except the first fall which was only a few feet high which a few fish would get into.

It was about 1921 that the Strathbogie crowd took their wagons and all, cream cans and everything, down to the Goulburn at Cathkin and angled a whole lot of Trout cod and some Macquaries and released them at 'Bogie'. It was 1927 that I first caught them there down below Polly McQuinns, a dozen to fifteen little chaps on the grasshopper. And didn't they take it! Later on I went into the Seven Creeks where the Euroa waterworks pipe comes out and I didn't have any bait with me. It was just a spur of the moment thing that I went in. But I had the spinning rod with me and I had with me the silver Mitchell spinners with the two wing things on them. Didn't I have sport! They were up to about three pounds. Sometimes away they would go and you wouldn't hold them on the trout tackle. They would hit it so hard and you could only break it if you tried to put the strain on. That was the best fishing I ever had I think. I never kept one because the silly twenty one inch size limit was on them. Everyone else took them at any age. I was the secretary of the angling club over here so I didn't want to get caught with undersized fish. Later on I went down and angled with bait for them and got seventeen. I

hadn't kept any the other time as I wasn't prepared. I had only gone up as I had heard about them up there. You have got to believe that the Trout cod is the fastest there is on your line at the start.

In the early twenties the angling club brought loads of cod over from Nagambie to Terrip. I didn't see the actual fish but I believe there was also quite a number of yellowbelly and bream with cod up to four pounds. I later caught yellowbelly from three-and-a-half to four-and-a-half pounds and quite a number of bream which established themselves all up these tablelands. They just seemed to follow up somewhere to go and down through here. And one yellowbelly of twelve pounds was caught a few years later. It had stopped in one of the pools in Hughes Creek.

It would not have been till about 1921-22 that I fished the Goulburn. Prior to that my uncles fished the Goulburn at Cathkin very solidly. I hadn't been there; I was too young at the time I suppose to risk the river. It took them nearly ten years before they got a twenty pounder on the spinner. It was a bluenose and I saw it, it was a beautiful fish. Of course the river was so full of cod, small stuff at the time. The food supply was good and they should have been able to gobble other cod. There didn't seem to be any great big fish like there was in later years. I went down to Molesworth where Ian Perry has the property now and I didn't go too well that time as I caught quite a few small ones and had one line broken. I had put a green frog on that line and the line wasn't good enough! They were bluenose cod, they were nearly all bluenose upstream from Molesworth. That would have been about 1922-23.

It was about 1927 that all the channels around Shepparton were full of small cod and Catfish. We had sheep over at Dhurringile where we had a hundred acres rented around the big house and in the evenings I would go up to the national channel and I would fish under the drop bar and get quite a lot of bluenose cod or as you know them the Trout cod. The national channel was so fast you wouldn't think it was possible for cod to stay in it. But half way up it there must have been a ledge or something, probably a step and I would fish in that with a great heavy sinker. If I got a four pounder cod on I would have to go down to the bottom to land him so that he weight of him would not break the line. And that was like that in all channels around Shepparton at that particular time. The bluenose were in the fast running water but there was also the ordinary Murray cod and Catfish.

Something happened to the Catfish. A disease or something wiped them out in one season really. There were dead Catfish everywhere. They built the Goulburn Weir at Nagambie first then the Eildon Weir. In the Nagambie Lake the fish just bred up. It was just ting ting ting with bites from Catfish and cod. The uncles used to fish it and I saw the fish they caught. I think that most of them were Murray cod. Of course Mulwala Lake on the Murray did the same sort of thing when they built that Yarrawonga Weir. I missed out on that one too. The people that were fishing it were getting twenty or thirty cod on the spinners to about seventy pounds. That was the pattern at Nagambie too. These patterns are weird. Whether the spreading out of the water over shallow ground created temperatures that were inducive to cod breeding I don't know. I think that's what happens. When they built the big Eildon and Hume Weirs that breeding pattern ceased altogether.

The old Eildon Weir used to go up to the Big River which was one of my fishing spots. We used to use bardie grubs for the trout as using worms the little bream about four to five inches long would just bang bang and you would have no worms left. So apparently there used to be a breeding spot in the Big River for the Macquaries. There were some bluenose caught there as well. I fished the UT creek at the time of the old weir and the young cod five to six inches long were thick. You would always catch a dozen in the evening. You didn't seem to catch any trout because they would not come around to where the cod were feeding. And quite a few other places were the same in the weir. But as soon as this later weir was put in it stopped all the breeding, both in the weir and in the Goulburn downstream though I believe there is still a bit of breeding that goes on in the Delatite at

the moment though not much. In the Big River there is now no small bream being caught that I've heard of and no small cod, There were a couple of cod caught at Bonnie Doon which must have bred up about four or five pounds. They could also have been bred up on the Merton Creek.

The era I remember is about 1924. The old weir was really a bonanza as far as trout went. The brother-in-law and myself were on the way up to the weir one trip and we stopped at Thornton to boil the billy and have some dinner. I was looking over in the water and I saw a big four pound rainbow trout come swimming up. I called my brother-in-law over and we caught four good fish there. They were all rainbows and we saw a couple more. We then went on up to the weir. That was in the Jerusalem Creek that night. We didn't catch any bream there or cod. I believe there was big breeding grounds they had, a bit like the salmon, that they had to come back to get the urge to breed. Whatever it is I don't know. While the old Eildon Weir was going apparently the conditions were still right for Macquaries to breed and right for the cod that were there too; they were bluenose but I am not saying that the Murray cod were not there because they should have been.

There were also Catfish all the way up to Eildon in the lagoons near the Goulburn. All those were full of Catfish. One old chap - Christie from Thornton - was telling me that the yellowbelly were up there. I never saw a yellowbelly in that area. He told me about a sheep dying on the bank and maggots rolling down into the water and floating away and he'd say that there would be five hundred yellowbelly coming along feeding on these maggots. I've never sent the yellowbelly there, Macquaries yes. He might have been mistaken tough the yellowbelly's a pretty distinctive fish in the water. If you can see him in the water he's a dark colour whereas the Macquarie was really white up in the Thornton area. Above Thornton in the rapid waters the small bluenose were just as thick there as they were at Cathkin and I caught them there about 1924, I took some Melbourne visitors staying up there and take them around to the Eildon Weir which of course was the show place, and we would always go fishing on the way back. Several times I stopped at this particular rapid, and I still fish it too as a matter of fact for trout and it was the same there as at Cathkin. Small cod in abundance. If you can get the cod breeding they'll overwhelm every other fish in the streams. The cod at Thornton, they were all Trout cod.

In the 1950s there were quite a few big cod caught up at Jamieson and of course quite a lot of good bream. I've seen several four and a half pounders come out at Jamieson and also the Howqua and at Bonnie Doon. I caught two myself one trip. I thought I had a six pound trout on! A four and a half pound bream takes some landing. Macquaries I suppose I should say. The cod at Jamieson were mostly fifty to sixty pounders and I would say that they were from the old weir. Both of the Yea and the Acheron rivers were known as good bream rivers, that's the Macquaries actually, and some cod but I didn't fish them much. I've fished the Acheron down there where it runs into the Goulburn, a beautiful hole there, and I stayed there to try and catch trout. I was a trout man then actually. I used to catch trout, browns and rainbows, near the bridge for the Taggerty-Alexander road. That was a great spot for trout.

I believe that the breeding grounds have been destroyed. In Eildon it is too deep and the Goulburn of course is now too cold. This I do believe. If given the chance to acclimatise they'll breed in colder water. You'll have to establish breeding grounds for the Macquaries up in the Big River and in all the others. The same will have to apply for the cod too, where the water is warmer. I think that the trout and redfin are a factor, a big factor. I'd say it's the trout more than the redfin. I think the redfin feeds mainly on baby redfin and school whereas the trout's a nomad, he moves everywhere. Any predator in a pool and you're going to have less fish aren't you? That's just simple arithmetic. So the release of lots of trout may have affected the bluenose in the stream.

OH 118

A letter from Bert McKenzie

Jennifer Davis and Brian Finlayson (2000) in a report on the granite creeks in north-east Victoria published as an appendix a letter written by the late Bert McKenzie recounting some of his memories of the fish and streams of the region. Professor Finlayson has kindly granted permission to reproduce the text here which is of value because Bert provided further detail:

Recollections of Streams in the North East Victoria. By Mr Robert (Bert) McKenzie

Years 1906 to 1913

All the creeks of the Tableland (i.e. Terip, Ruffy, Dropmore, Caveat, Tarcombe and Kobyboyn) were packed with Black fish and Silver minnows. All were crystal clear and it was possible to see to the bottom, down to six or eight feet at midday and (as a cousin and I used to do), it was possible to grind up a few worms with sand and drop them in the pool. We would fish for the bigger ones. Fourteen inches was our best. Most of our haul would be round 13 inches down to 9 inches. However, someone caught one 15 inches.

In 1912 or 1911, Mr Jimmy Hobart acquired, from Ballarat, 2000 brown trout and, from somewhere, 6 tench which were all released at the Boathole, Hughes Creek, Ruffy. They spread and bred rapidly down stream and were being taken up to seven pounds by 1914. In 1912, 2000 rainbow (trout) were released. In the spring of 1914, I landed my best some twenty yards behind me and about the same height.[1] and by the autumn was handling fish up to four and a half pounds. Prior to this, in 1903, my father had taken me down twice to the Dropmore on the lower Hughes Creek, just a mile above the Homestead, and using worms and caught small cod (Trout cod) up twelve inches and saw my father take several of two and three pounds. On a later trip with a party of four, everybody caught cod up to six pounds and every hole had six to ten inch fish galore if worms were used. Our next trip in 1913 was a disaster. A cousin was killed and virtually ended our Cod trips. The Hughes Creek for two miles above Dropmore up until 1916 was a slow running stream with a series of very deep holes mostly edged with Capungi reeds. In 1916, a flash flood ripped through and tore the creek bed down to bedrock and left a long channel of sand and in my opinion swept away the Trout cod breeding grounds in those Capungi edged pools for the whole of the Hughes Creek. Whether or not that flood carried the whole of the Cod population down into the Goulburn and the Nagambie Lake area, I do not know. But around 1918 to 1924, Nagambie was the Mecca for Cod fishermen from all over and in that period and was probably the supply area for all the Trout cod that inhabited the National Channel which filled Waranga Basin and the Wilson Channel feeding Shepparton, Tatura, etc. Even the smaller channels carried small Cod and an occasional four pound Catfish. I had Cod to four- and- a- half pounds from both the National and Wilson.

Old Nagambie residents could probably supply the exact dates of this era when suddenly the whole Catfish population were wiped out in the Goulburn River system. The same thing happened in the Murray River system, I think after the second stage of the Hume Weir or when??? Anyhow that flash flood was the end of the Trout cod in the Hughes Creek in the Dropmore area. I certainly caught a few while fishing for trout in 1919 to 1934 or 1924. These were mainly around the four to five and a half pound weight and an odd two pounder, suggesting that there may have been some fluke breeding. In 1920/21 we had one hundred acres rented around the Dhurringile Homestead, Toolamba, hence the fishing in the channels. At the same time the home base was one farm on the Sevens Creek followed by one on the Castle Creek in the Branjee area. The Castle Creek had quite a lot of Macquaries and Blackfish and the Seven Creeks, from the farm, five miles from Euroa was loaded with small Trout cod, Macquaries and Blackfish. The Seven Creeks in drought years often stopped running from Euroa down, concentrating the fish in the deeper pools and for a few weeks the fishing was fast and furious. Fish in the main were Trout cod and Macquaries to two pounds. In those days there were miles of those waters, all heavily stocked with Trout cod (small) and Macquaries likewise.

In those days it seemed impossible that mere fishing would overtake supply in the Goulburn River which I fished at Molesworth, Cathkin, Alexandra and Thornton. In these stretches of the Goulburn in those days at Christmas and Easter, it was estimated that the campers numbered 500 to the mile of river. They came from Melbourne by train and the local farmers carted their camping gear to the river and I have no doubt profited considerably by doing just that. It would seem at the time that it would be utterly impossible to eliminate the Trout cod and the Macquaries from the waters they inhabited. But around 1922 or 1923, the old Eildon Weir was built and acted, I believe, as a settling dam and the water became crystal clear and I believe the smaller fish became easy prey for the large Trout cod and Redfin then inhabiting the river. In the Eildon itself, various stretches were teaming (Big River) with small Macquaries and in the UT Creek area, I landed at least 20 small cod proclaiming at least two breeding grounds for Trout cod and Macquaries. The Cod fishing deteriorated in the Goulburn and the Macquaries to a lesser extent, but after the greater Eildon Weir was built in the late Forties, both fish have been practically wiped out, at least as a fishing proposition. In so far as the Macquaries are concerned, the breeding grounds have been destroyed by the colder water or siltation. I believe that where the main streams enter our reservoirs, new breeding grounds will have to be established not by releasing fry but establishing natural breeding places by the use of spawn or eggs in a natural setting in the river beds to which mature fish will return when their turn comes to drop their spawn.

From what some of the older residents have told me in the Riverina, streams completely dried up in severe droughts (before Samuel McCackie built dams on them) but the small cod and big appeared back in the streams as soon as those streams began to flow again. Their breeding grounds would be headwater streams that did not stop flowing.

> *1. The author can recall Bert stating at the first meeting that the largest trout he personally caught from the Hughes Creek weighed seven pounds. The term 'similar height' may actually have been 'similar weight' in reference to the previously described capture of a seven pound trout.*

OH 119

Russell Stillman was interviewed in February 2007 at an age of 90 years.

Dad's Ford agency garage was originally my gran dad Stillman's stables and coaches. My dad, William Lesley (Les) Stillman, at 17 years old drove a coach with six in hand loaded with passengers and food and supplies for the gold fields at Big River. The trip from Alexandra took in Thornton, Eildon, Darlingford, Jamieson, Gaffneys Creek, Woods Point and back through Mansfield – a week's trip. I remember when I was very young my father used to go on Sunday mornings down to Magee's Beach on the Goulburn here and in no time he would have a collection of cod and Macquarie perch, a dozen or more of them. The old brown photo is my dad and the kid me, about 1924. Dad went to McGee's Beach on the Goulburn just below the bridge one Sunday morning and was home by one o'clock. He angled this bunch of small cod and bream on worms.

We used to get the Catfish out of the lagoons. They'd get in the reeds and pull very hard. We used to get a few in the river too, but they were very common in the lagoons. When I was 8 or 9 years old I got a big Catfish, it would have been 6 to 7 pound. I can remember about that time my father and his mate went down to Hall's Flat on the Goulburn. In the floods the water would go all over the flats, the lagoons would fill with water. This Sunday they went down to this hole in the lagoon, its still there, I look at it all the time. After a while we got a 3 pound Macquarie, then another good one, be a good three-and-a-half pound, and others. They would have got washed in there in the floods because it flooded nearly every year. They would have been there a year or two because they were very black. Floods were a problem. If the weir was holding good water and some years with heavy rain the overflow went over the spillway, sometimes two feet of water. As a result all the flats from Thornton to Seymour went under water and I remember some years Alexandra was cut off for a few days when Home Creek at Cathkin flooded the road.

In the river you used to get a lot of small cod, 3 to 4 pound, but you would catch big ones if you set lines for them. I remember my father set some lines and got a 12 pound cod and tethered it. When he went back he pulled in the line and there was a 40 pounder on it, he had eaten him! I went down to Brook's cutting with Ollie Johnson and pretty early on heard this wallop; it was a good cod feeding. Well I chucked in this line with a frog on it and got this fish, it was pulling hard. Ollie had to hang onto me, but eventually he broke the line. Back then in the Goulburn you mainly got the cod and the Macquaries, with an odd Catfish, and there were greasies or slimies too. I never saw any yellowbelly or grunter out of the Goulburn never saw them till I went fishing out past Conargo. There was a good fishing hole in the Goulburn on Ollie Johnson's property known by him and us as "the stump hole", near where the Dry Creek runs in before the road climbs to Brook's Cutting. When the floods receded and the top of the stump showed was the best fishing time. Ollie would ring and leave a message for me and after school I'd ride the bike down, about 2 miles. One evening I was fishing and I caught some nice bream and a cod about 10 pounds. Ollie arrived and fished the fast water off a gravel spit at the head of the pool. He told me he was off to Melbourne the next day and wanted a nice eating cod about 9 or 10 pound for some friends. He was courting a lady, who he later married. Using scrub worms he caught a 6 pounder which he put back. Then he got a good 20 pounder, which went back. After a bit of time his next bite was what he wanted, a good 10 pounder, and off he went. Ollie was my dad's best fishing mate, lived on a big holding of river flats on the Goulburn and hill country, originally the Hoglington selection. He had ferrets and would catch a dozen or so rabbits, tie them in a bundle, and from his flat bottomed boat suspend them from the trees over a favourite hole for a few days. On Sunday Ollie, dad and I would fish the hole and catch a nice lot of mostly bream, sometimes a small cod. The maggots in the water brought in the fish.

With the Macquaries the average ones out of the Goulburn would have been one-and-a-half to two-and-a-half pound, with the big ones being 3 pounders, though out of the lake I did get 4 pounders. There was a lot of them in the Big River too. I remember once the week before the season opened I went up there one Saturday. I'd been told you could see the bream in there, there was supposed to have been that many of them. About three weeks before then a 34 pound cod had been caught there, that was in the Big River near Two Bridges. It was crystal clear and I was on a sandy bank under the Teatree, and there was a gravel bank on the other side, so I threw out towards it. Then I looked over and the gravel bank was gone, the bank was a heap of 3 pound Macquaries, it had been a shoal! That was about 48 years ago, my son was with me. I can remember up at Jamieson Ron Henderson who worked for the CRB using a rake to rake them out of the Goulburn, that's how thick they were when they were spawning. The greasies we used to get out of the Goulburn, and they were in the weir, I've caught them out of the old weir up to 15 inches long, they're beautiful to eat. When I was a teenager my father took me fishing up to the weir. He believed the Macquaries bit best on the full moon, though later on I reckon they bit best when they were spawning. It was near dark and I had a scrub worm on a big cod hook, sat the rod down in a forked stick. Anyhow it was dark and I checked my rod and the reel had been pulled up to the fork and the stick bent over. When I wound it in there was no fight but there was a greasy on the end of it, about a foot long, it had been part digested, he was all soft and white. A big cod had grabbed him!

The cod and Macquaries went up the Acheron, I used to fish it about three quarters of a mile up from the 'Breakaway' and got them there, but they went up further. I had a friend Wilfred McColl, he used to catch them out of Connellys Creek, used to catch the Macquarie perch and cod in this hole on the farm, that's up past Acheron, they were common up at least that far, and as far as I know they went up past there. We caught bream up the Acheron on a property owned by Dad's mate Bill Keen, later known as "Squires", about two miles up from "the Breakaway" where the Acheron joined the Goulburn. Once we camped in Keen's hay shed and fished at night. We could handle the mossies but the tiger snakes were a different proposition. They came out at night and there were so many of them we gave that away! Snakes were everywhere on the flats in those

days. You would see half a dozen on the walk in and had to be careful fishing the bank. There was no development. Tea tree, rubbish, tussocks, thistles 6 feet high, everywhere. Now it's all ploughed, cleared, and cropped, and the poor old snake has nowhere to hide and breed. .Ollie Johnson told me one flood time he was rowing the flattie over Magees Flats opposite his home getting flood rabbits hiding in the tussocks. In a hollow where the flood stream went through there was a wire netting fence across the stream. He counted about 200 half drowned snakes hanging in the netting! We gave that fishing area a wide berth that summer!

There was a bloke here, Eric Milroy a railway ganger; he was a really keen fisherman. He invented the first bubble, got a bit of beeswax, made it as big as marble; he could cast a mudeye out into the lake where the trout were feeding. He had a flat bottomed boat tied up at the bridge down there near Molesworth. He always had three or four setlines in tied to the Wattle trees with goldfish for bait. Every week he would catch two to three cod, 30 to 40 pound cod - that was back just after the war in the late 40s. The dark square photo has a story. The fish were caught on McRae's Bend on the Goulburn, in from Whanregarwen Road. A share farmer and his sons said they had a spare weekend on the property and would set a few lines on the bend to see if the cod were biting. They sure were! Comparing the size of the man there would be a couple around the 60/70 pound mark. The bait was yabbies, scrub worms and a couple of parrots. The same people caught a 60 pounder another time and when cleaned a tiger snake was in its belly. They refused to eat it and boiled the fish up in a drum and fed it to the chooks! We used to catch a lot of river cray in the Goulburn between Alexandra and Thornton; my memories are about 1929 to 1932. Each year after the floods when the river got back into its banks but still running yellow, my dad got some sheep's heads off butcher Bill Barton. Dad made some big mesh drop nets from twine or hay band around 3 to 4 feet across. Cut a few 8 to 10 foot suckers growing on the river bank as handles and dropped the nets of high banks. He would get 3 to 4 every lift and have several chaff bags full. Cooked up in a copper and kerosene tins and were delicious.

Work was started on the weir in August 1914 and finished in 1928. It was done with horses, drays and scoops, and fork and shovel. After the weir filled about 1927 for a year or so the water was black from the submerged eucalypts. We used to get a lot of cod out of the old weir, they bred up in there, and the Macquaries. About 1929 or 30 a rabbit trapper, Jonesy, who lived in a hut on the waters edge near the site of Coller's house, Fraser Park, came into my dad's garage on his monthly trip for a tin of kero. "Les", said Jonesy, "What sort of fish is this?" producing a 3 pound Macquarie perch, bream we called them back then. With great purpose and excitement my dad said "That's a bream". "Well" says Jonesy "One evening out from the hut on the flat I saw a few fish taking insects. I threw a line in with two hooks and caught two like this. Good eating too!" Next Sunday dad, a couple of his mates and me (about 12 or 13 years I think) made the tough trip over the rough access track. We fished what is now known as Picnic Point. We caught about 17 bream, which was a poor result back in those days. The next Sunday we fished further round in the bay opposite Picnic Point where the original road before the weir crossed the hill. A 40 odd result wasn't bad but the next Sunday we ventured further around Cooks Point to what is now known as Italian Gully. The result is seen in the photo. We got 117 Macquaries out of the weir as well as a cod and two trout each about 8 pound. I recall the full catch was 117 because we had given away a lot before the photo was taken. The picture was in the book "The Whole Dam Story". The fishing was about from 10 am to 3.30 pm. A local old time photographer with the camera on a trestle and black cloth over his head! The back drop was the garage doors and a few car lights as you can see. The two eight pound trout I tossed behind a log because I didn't want them in the bag with the good bream. The cod was caught by Ollie Johnson in the mouth of a seasonal creek which ran into the lake, the Mountaineer.

I can remember when the cod were dying in the weir; I reckon it was about 1932/33. I used to troll in the lake, rowed for them in the boat; there was only about three boats on the lake back then. I would have had to have been 12 or 13 when I had the boat. I remember seeing the carcasses in the lake, out near Forsyth's all along the

bank; they'd been dead for a few weeks. I remember seeing numbers of them, the ones I saw were cod though I think Macquaries died too. They were all over 10-12 pound, up to 30 to 40 pound, I saw 6 to 7 dead another day too. I remember about 1937/38 a workmate told me a couple of years prior a group of fellas gathered after work for a barbeque and booze up at Picnic Point at Fraser Park on the old weir. They put in a gill net to get a feed and camped the night through. In the morning they couldn't retrieve the net – reckoned it was snagged. They backed the car down near the water and towed it. My mate reckoned every second mesh had a fish! What sort, I asked? 'Don't know, all colours and shapes, I was just the car driver, not interested in fishing'.

I used to catch cod in the lake, not many, but you'd get them with the aeroplane spinner if you kept at it. Best run I had was in the old weir, I leant my boat to a friend of my dad's who camped at Picnic Point for three weeks every year. He fished around the big trees and a few days later I got a message from the butter factory from this bloke 'the cod are biting'. He had sent in a couple of nice cod for the factory cool room. The next seven or eight Sundays I fished the aeroplane spinner and caught a total of 13. Funny thing is they were all about the same size – 11 pounds. A bloke named Sonneting from Bonnie Doon was fishing at the same time and way as me, but in a different area. He was getting big ones often, 30 pound, in a very snaggy spot which I was avoiding. The blurry photo of the cod I caught with bait one evening. The larger one weighed 10 pounds but just made the legal length of 21 inches! I reckon the still lake water didn't give them enough exercise, no current to swim against. I've caught 3 or 4 by chance on a small "Reflex" Devon, with one set of treble hooks, when trout trolling. The one on the boat with the Sugarloaf background was one. Also one year when the weir was low I caught those two 3 pound Macquaries on the same Devon over Savage's Flats in about ten feet of water when trolling for trout. That was in the late 30s, about 1938 I think.

The cod and bream were still fairly common up until the new weir was built, then the cold water affected them, they rapidly disappeared. And the river going up and down for the irrigation. The redfin, well we never used to get them out of the river until the new weir went in, though we got them in the lagoons going a fair way back. The redfin in the river happened more recently.

OH 120

Peter Kerr of Taggerty was interviewed in December 2007 at an age of 69 years.

My father was born in 1889 at Taggerty, and my mother always talked about how common the cod and the bream were in the Acheron in the early days, he did too. Back then there were no trout in the bigger rivers, the trout first appeared in the smaller streams, the Rubicon, the Little River, the Taggerty and the Steavenson, but none in the Acheron and the cod and bream were still common. I think they were caught as far up as Buxton, there was a lot of deep holes, fast and slow stretches in between, all the way up to Buxton. Down from here was mostly slow moving. By the 1950s they were gone. My father later bought at property down the river at Kerr's Road, and they caught the cod and bream there too, they moved there about 1929. I'm sixty nine, an only child; my mother was forty three when she had me. The cod in the photo was caught just above Taggerty, about 1925, they were living in a house on that property, the old Kerr property was on the other side of the road, near where the power lines are now. The photo was taken because it was a big fish for the area; I was told it was nearly thirty pound. My mother knew all about the cod, she came from Renmark in South Australia, she lived there right on the river, one of her brothers was a Murray River captain.

Mrs Alex (Dorothy) Robinson, she used to talk about the cod and bream in the river, she came to Taggerty as a school teacher about 1924 or 25. She used to talk about how they always had a drum net in the river; they used to get a fair few. The other story she used to talk about, there was a fellow that used to live at Acheron, Eric Cumming; he was doing the bridge contract. He used to walk from Acheron and cross a large log down the river. Alex Robinson had his drum net in there and Eric found the drum net and stomped on it. He was telling her how pleased he was about it, and Mrs. Robinson said he didn't know how many times he'd had a feed out

of it at their place! By the early 1950s fishing parties would get big numbers of trout, up to fifty out of the river, by then the cod and bream had gone. The trout had got common in the Acheron by the war. Then they snagged the river because of the big floods in the fifties, they pulled the snags all out, my father was dead against it. It did nothing towards the floods and ruined the trout fishing.

OH 121

Ron Bain of Seymour was interviewed in January 2007 at an age of 88 years.

I was born in Seymour, grew up and went to school here. I was the youngest, one of ten. I started work at 14, did my time as a plumber with the railways. My dad, John Edward Bain, he knew the Hughes Creek backwards. He used to say about the cod and the bream being thick, around about Kulabah, used to go up through Tarcombe - that was a bit before World War 1. They weren't big cod. We knew all the people up around Habbies Howe, old Dick Webb bought the property during the wool boom, 9000 acres, between Dropmore and Tarcombe. The cod weren't big up there, dad said, and different to those in the Goulburn here. They put it down to the clearing of the land and the rabbits, and the creek the holes filled up with sand; they were up to 20 feet deep. I think it was back in the 1920s, I can just remember the change in the creek, we used to have picnics out there, further down the creek, just this side of Jeffries'.

We had bamboo growing in the yard; we would cut them down to make poles. Dad would tie a chord and a hook, and a cork for a floater. We'd go out on Telegraph Road, in the lagoons which went all the way around to the Trawool Bridge, and we used worms for bait. They were full of Catfish, bream and the greasies. The greasies we loved the best, up to 9 to 10 inches long, they were beautiful. The Catfish, all about the same size, about 14 inches, you could easy fill a sugarbag with them, no worries they were thick. We stunned them. The Catfish disappeared out of the lagoons towards the end of the twenties, maybe the early thirties. There was a cod or two in the lagoons, but we didn't worry about them much or never bothered much with the river. The bream, that's the Macquarie perch, were all the same size, no more than a pound and a half. A local butcher brought in a hundred pounder - a cod; mum put it in the bath till dad got home to clean it.

In the early thirties we used to go on holidays, dad made three flat bottomed boats. We'd go up to Alexandra by truck. We'd take two weeks, two in each boat, to get back home, fish all the way, spin and fish. We'd camp on the Islands, near Alex and along the way. At Alexandra we got mostly cod and the odd bream along the way. We never heard about many big cod up that way and never saw a yellowbelly. They were nearly all the bluenose cod up there, the biggest we ever got up there was 10 or 12 pound as well as smaller ones. The bluenose has a pointy nose, where the head on the Murray cod is like a shovel. The nose was a lot longer too, and darker, sometimes almost blue, but not always. What I noticed about them, they were darker, with spots similar to the trout we used to catch. The eyes were different, they sort of protruded more, and they were more of a greeny grey colour than the Murray Cod, and the Murray cod were lighter in the belly. They were really common down to Kerrisdale with the odd Murray cod amongst the bluenose, but you hardly noticed them. They used to get gold at Kerrisdale, there was a race, and they'd wash for gold in there.

The bream were usually a pound to a pound and a half, no bigger, never saw a decent sized one. They were very common, though they were more common in the lagoons near home in the early days. We took my future brother- in- law from here to Alex. He took a kerosene tin with cow dung to keep the mosquitoes away. We used to sleep on the gravel beaches, we would catch a couple of rabbits, we loved the holidays! The bluenose were not as fat and greasy as the Murray cod in Seymour, we use to get big slabs of fat out of the Murray cod, it was a lot thinner in the bluenose. I thought they were better to eat.

I'd say Kerrisdale was the start of the changeover; you got both types of cod there in fair numbers. The Murray cod at Kerrisdale - well the biggest one I saw, the caretaker of the property he caught a huge one on a cross line

made of electrical wire, it was 117 pound. It was bought up to the Kerrisdale railway station to weigh it on the platform scales, I saw it there. The Murray cod, well once you went much below the Trawool Bridge that's all I remember ever seeing, there might have been an odd bluenose amongst them, but not many. Once I started work I started fishing the Goulburn a lot. Dad built me a boat, a double pointer. We used to shoot Darcy's rapids, just down from the Trawool Bridge. I used to fish a lot from the willows at the back of Tallarook up towards Landscape; there were big holes in the river there. We used to get the big crays up there too. We'd go up to the slaughter yard, get a sheep's head, we made a drummy, and we'd get 20 to 30 big crays, no worries.

I mostly got cod out there, 40 to 60 pound; I was a bit of a terror, and 'ding dong' (Ron) Bell he was up that way too. I used to get little greasies and put them on, in later years bardie grubs and small reddies. And the crosslines, well you had to sink them at a sharp angle so that the aeroplane spinners wouldn't catch up on them. Being a plumber I made up special weights for them. Even though I was a bit of a poacher I always threw the small ones back. I had a mate; we would go out with aeroplane spinners. The best way was one casting in the front out towards the logs, and the other trailing. You would always get some parrot feathers to tie on them. We'd head out there all the damned time. You could really guarantee a cod, all year round. We used to go up behind the homestead at Findlay's; just behind there was an island in the river. We would go up there in the faster water, we hooked into one that was about 20 pounds, we were only kids then.

In the Yea River there were good cod. In the King Parrot I've only caught trout in there, but the old blokes told me that there were cod and bream in the early days right to the top of it. The redfin started about then in the thirties, they were first caught towards Nagambie, then came up the river. In the Sunday Creek, I caught the best redfin I ever caught. I got about ten of them, 6 pound and a bit over, every one, they were magnificent. There had been cod in it too, actually all the creeks in the district, well I was told in the early days they were full of cod and bream, up into the hills. The bream here got scarce about the war, and the cod fishing had started to back off. But the new weir was the biggest change. The river changed altogether, even in its appearance. We used to swim all of the year, now it's too cold, damned if I could get in it.

OH 122

Ray Hopkins of Yea was interviewed in October 2006 at 77 years of age.

Cod were caught in the Goulburn River near Yea, outside the rowing club, up into the 1950s. The biggest was 52 pound. My grandfather talked about how when he was young how he could catch the black bream up at Cathkin by the sugar bag. That's the Macquarie perch. That would be going back a while, yes, World War 1. The black bream, well the Yea River used to be full of them. Old Con Hildebrand used to talk about up the river. He lived near Devlins Bridge, opposite it. He talked about how any Sunday they could go down to the rocky pools up from Devlins Bridge, up through Glenburn way and catch the Trout cod, up to 5 pound, catch a 5 pound Trout cod any time. They were the Trout cod, lots of them, up to the 1930s. And the black bream in the rocky holes. They talked about the Catfish being around Yea too.

OH 123

Digger Garlick of Yea was interviewed in October 2006 at nearly 80 years of age.

My old man grew up in the area. He talked about catching the Catfish in the Yea River, and a lot in the lagoons. But I have never seen one here, or caught one at all. He talked about the cod and the bream or Macquarie perch being common in the Yea. When I was growing up there were all sorts of fish in the Yea, cod, redfin, trout, graylings. I never caught a lot of the Macquarie perch in the Yea, just a few, once in a while. Caught one not long ago, that was a shock. When I was young they were common in the Goulburn, only 4 mile from here. You could catch them in the morning or the evening; they were up to 3 to 4 pound. They were still caught till the weir got raised in 1956.

I did catch the Macquarie perch in the King Parrot too; my brother was on a farm out there. They were only small ones out there. It was a great place for the graylings, or some call them greasies or slimies. They are not the Blackfish; they're on the other side of the divide. Don't grow to any size. They were common in the Yea and the Murrundindi. The redfin in those days, well they would get into the lagoons in the floods in spring. In summer when they got low we would mud up the lagoons, get in there and stir them up. The redfin would come up, and we would stick them in a cage in the river to clean them up.

The cod in the Yea, the old man talked about catching lots. Any amount, any time. They were still around in the 1940s, most common about 3 to 4 pound. The biggest I saw was 12 pound. They went right up the Yea, way up, and up into the Murrundindi, way up, up to the cascades. There was a good one caught in the Murrundindi on a springer up past the Murrundindi Mill, but the cod were common in the Murrundindi a long time ago, back in the 20s. The cod when I was young were more common in the Goulburn. We used to fish from Molesworth down to Trawool, used to go a bit down Tarrangaville way. The biggest cod I caught out of the Goulburn was 63 pound; others I think might have caught bigger than that. The old man talked about seeing one swim over one of the sandbanks, talked about it being like a big pig.

I didn't know about the Trout cod back then, though I know about them now. I've caught plenty of them at Murchison in recent times; they've got the longer nose. We were working at Molesworth about 1945-46, and I remember we caught on a springer this 'cannibal cod'; it was long with a huge head with the nose, about 5-6 pound. It was a Trout cod, they were there, but we didn't take much notice back then. We caught trout at Molesworth too, plenty of them, and in the Yea.

The last cod I saw come out of the Yea was about thirty years ago, and that was the first for a while. When they raised the weir in 1956, well that buggered it for the cod in the Goulburn. It got too cold. All you could catch was trout. But that doesn't explain why they disappeared out of the Yea does it? They were going before then, and the Yea never turned cold. Then the carp came in, though there's fewer around now, but bigger. At the same time the cod have come back recently in the river down at Undera, down Shepp. way. We caught 70 in four days, from about a foot up to the 60 centimetres. And the grunter, they're great bait stealers. But hardly any yellowbelly. Caught lots of grunter in the Edwards these days. The old man never talked about seeing yellowbelly or the grunter in the Yea area.

OH 124

Bill Morris of Molesworth and was interviewed in October 2006 at 80 years of age.

There were lots of redfin and tench in the lagoons (c1945). When I first came here you could put a big drum net in the lagoons and catch lots of tench and redfin. The Catfish, well by then there were one or two, not much to talk about. Apparently there used to be quite a few around here in the lagoons. That was about the end of them. At the time the bream in the river, there were a few. You would fluke them. Just a few, nothing worth talking a lot about. They were caught on and off. At the time they were starting to get a few trout here. By 1945 the cod, well there were not many cod, just the odd ones. It was not like you caught them all the time. You had to work for them. Some were a fair size. I saw Jack Roberts catch a big one. Yes, about 50 pounds. With the weir, it stopped the floods. The cod would move into the lagoons and breed up, and leave. The last of the big floods were in the 1950s. The Yea River, well by1960 there was just about only trout and redfin in it.

OH 125

Bruce Nicholson of Home Creek was interviewed in October 2006

About 1948 the Home Creek still had cod in it. We had a farm, 3 miles up the creek from Cathkin. I mainly got trout and redfin out of it. I once got a cod, be about 8-9 pound out of it, below Nicholsons Road out of the swimming hole in a drum net that was the only one I caught. There used to be bream in it, but I never caught

one. My grandfather settled it, and he used to say how years ago that before tea he could get a sugarbag full of the bream, in an hour before dinner.

OH 126

Collin Bell was interviewed in September 2006 at nearly 93 years of age.

My father was a mad fisherman and took me down to the Goulburn (at Seymour) when I was 5 years old. At Seymour 80 years ago we caught the Catfish, mainly in the lagoons, but I caught them in the river as well. We didn't have scales to weigh them. Yes, the biggest would have been that, about 3 to 4 pounds. We would catch the bream; they used to be very common. They would start biting early, before my birthday in October. We also caught the grunter around Seymour. They were fairly common. They were caught in early September, though nowhere near as common as the black bream, the Macquarie perch. I think we caught a few yellowbelly, not many. We would occasionally get a trout.

The cod were abundant. We caught two types, the normal Murray cod and the smaller type which was a different colour and markings and very different in the mouth. I think we called the smaller type "Trout cod". We mainly caught the normal Murray cod, not a lot of the smaller type, just some. There was a lot more of the smaller type further up the river. At one time my father was at Molesworth, we owned land over the bridge, I think the property was called Fernside. I saw a lot more of the smaller type of cod up there with my father. I remember my grandfather went up there for a week, up past what became the Perry's property. Father rode up there on the Bridle Track. That was 80 years ago; I remember having dinner with my grandfather.

I've fished down to Hughes Creek near the mouth, caught there mainly the bream and some cod. In 1934 I played in the football and we won the premiership. In 1935 I went away from Seymour, came back in 1946 after the war. The Catfish had disappeared; there was a lot of the redfin around. The raising of the weir in 1956 was the beginning of the end for the cod.

OH 127

Ron Bell of Seymour was interviewed in September 2006 at an age of 83 years.

When I was kid the black bream were in the river in droves. I caught them up around one-and-a-half pounds though I saw them caught up to 3 pounds. When I was about 20 they got replaced by the redfin. I never saw grunter in the river here, though I caught plenty below Shepparton way, down near Wyuna. At Wyuna I used to catch lots. The first time I saw a yellowbelly here was two years ago. That's the first time in my lifetime, here in the river. I remember when I was a boy the lagoon near the old weighbridge; it was a big lagoon when I was a boy. A fire had burnt the place out, then a thunderstorm washed all the ash in. I saw them cart all the dead cod out of the lagoon, they used pitchforks, used drays. Years ago the lagoons were full of Catfish. They disappeared within a space of 2 years. All the little creeks around here were full of greasies.

In the river here were the two types of cod, but mostly the Murray cod. Up at Molesworth when I was a kid in the old times we used to row boats down the river catching cod. Take 2 or 3 days to get to Seymour. Up at Molesworth we caught only cod, never big ones, not bigger than 20 lb. though we may have got busted off by bigger ones. I can remember clearly one fish that was 15 pound. It was definitely a Trout cod. Around here the biggest cod I remember seeing was caught by a local engine driver, Mick Lee, it was 96 lb. Can't remember the date but it would have been more than 45 years ago. I think I saw a 106 pounder in the butter factory with my son 40 years ago. He remembers it. The big cod were taken up to the butter factory as it was the only place back then that could keep them cold. Most of the cod I caught were on carp, yabbies, greasies, tench - any small fish. At Findlay's just north of Seymour I tied up my tinny to a snag about 10 yards from the bank. I used bardie grubs and within 7 minutes I caught two cod, the first 22 pound and the next 54 pound. Had them both in the boat by 5.05 am!

I had an old neighbour that told me that he used to catch cod in the Hughes Creek, but that was before my time. In the Sunday Creek there were cod and bream. They were caught as far as four to five mile up from the Goulburn. When I was a kid you could catch stacks of shrimp, big shrimp. But by the early 1950s, even before the new weir went in, there were not the small cod in the river like there once was. In one day I once caught three redfin over 4 pound, the biggest was four pound fifteen ounces. It was weighed on the greengrocer's scales. That was in Maar's Lagoon, near Dysart. The trout fishing, I used to do it in the hot months, I would spin for them, catch them 2 to 3 pound. My old boss was a fly fisherman; I cleaned them up on the flies!

OH 128

Keith Jones of Seymour was interviewed in September 2006 at an age of 74 years.

Prior to the 1914-18 war that there were tonnes of cod in the river around Seymour. He (Keith's father) *told me the story about going up to the "Leg of Mutton" hole in the Hughes Creek below Ruffy. It was nearly dark, on dusk, and he threw his line in. He couldn't see how deep it was. Next morning he caught a cod, a 14 pounder and in the daylight he could see that it wasn't real deep, fairly shallow. He thought he had caught Goulburn Jack in that shallow water! He told me he used to catch a lot of cod up there, all small cod. Prior to the 1914-18 war my father worked at Northwood Park stud. He used to go to work on Monday and stay the week there, come home on the weekend. He would hop in the boat on the river there and row up and down the river. He did it for 2-3 weeks and one evening caught 14 cod, all caught on an old spoon. The last cod crumpled the spoon! He used to catch lots of the bream and the Catfish. He never mentioned catching grunter or yellowbelly here. He used to tell the story of catching a 60 pound cod out at Northwood at Aublong's, and it spat out a platypus!*

50-60 years ago I saw some blokes fishing in the river here and as you do I asked if they had caught anything. They had caught a Catfish, the only one I ever saw caught here. I used to fish a lot around here. Caught lots of cod, mainly Murray cod. For every 10-15 normal Murray cod you would catch one of the "blue cod". They were smaller. The normal cod were up to 80-90 pounds. The blue cod were up to 40 pounds, maybe to 50. I fished a lot from Seymour down to Northwood. I used to fish mainly behind the pubs here for the next 2-3 miles downstream. That's where I caught the blue cod. "McClarty's" (between the Hughes Creek junction and Tahbilk) was famous for cod. In the Goulburn below Wahring, down to Murchison I caught Murray cod, yellowbelly, redfin and the silver bream. I had never caught a blue cod in the past down there. This past summer (2006) after a release of water from Nagambie the cod went mad. I first heard of it from a friend of mine, he had 5 mates, caught 40 for the day, they had 3 boats. His boat managed 3 keepers, this was at Toolamba, all caught on cheese. After that I fished at Arcadia, caught a mixture of blue and Murray cod, mostly undersize, I managed to hook one good fish. Using 30 pound line, had trouble turning him or lifting him off the bottom. The usual story! Yes, he got into a nest of snags and eventually broke off.

My nephew has caught odd cod at Tintaldra on the Murray. Years ago I used to go fly fishing up that way. At the time there was a lot of cod in the Cudgewa Creek. When I used to go fly fishing up there the locals told me there was a lot of cod in the area, mostly up to 15 pound, and how they used to move out of the Murray and into the creeks for spawning. I've caught the Trout cod down at Murchison. The Catfish may be coming back in the weir. I have heard of people fishing the backwater at Chateau Tahbilk at night time and catching Catfish.

OH 129

Jim Hanley was interviewed in September 2006 at an age of 65 years.

My father caught a "rock cod" at Coomb's, that's between here and Nagambie (c1951). It was a blue colour. Fifty years ago we used to catch a lot of cod here. I used to catch a lot of Macquarie perch in the Hughes Creek, and they are still there! The biggest Macquarie perch I saw caught was at Murchison East. They were up to four pound there. We used to catch them consistently at Smith's property. Robert Smith now has it. Used to catch a

lot of Murray cod there, the grunter too. I used to catch a lot of redfin, and a few trout there. The last Macquarie perch I caught there was back in 1972. That was also when I had my last good catch of grunter there. One was 3½ to 4 pound; after that they declined. I previously used to catch Macquarie perch from the same hole. There was a sandy beach off the beautiful deep hole. I spun that Macquarie perch on a Mitchell spinner near some logs. It grabbed it near the bank and was about 2 pound. That was the last one I saw there. After that time everything declined, that was about the time the carp arrived. Since then the silver bream have come back there but not the Macquarie perch. In April 2006 I saw cod being caught again at Murchison East. I know of Catfish being caught from the backwater at Tahbilk. That's the only spot. I've never heard of one from the river.

In the 70s, there's an anabranch out of the Goulburn, on a property called 'The Prim' owned by the Andersons on Ghin Ghin Road. We were fishing for trout in a row boat, and on worms we caught about half a dozen Macquarie perch. We normally caught lots of trout out of there, and the old man got a 35 pound cod out of it. More recently, about 6 – 7 years ago, Bob Homewood put a dead yabby on and lost a big cod, he said about 45 pound, out of there. Henry Royals, a train driver, was the last consistent cod fisherman in Seymour. He gave it away in the 80s; he said the trout were taking all the Bardies. Even Neil Attwater had given it away by then.

OH 130

Graham McLeod, former professional fisherman, was interviewed at Nagambie in January 2007 at an age of 84 years.

I was born in 1922, the McLeod's came to Australia in 1835, they arrived in the area not long after near Kirwan's Bridge, named after Joanna Kirwin. They built the weir here in 1898 that backed up the lake here. My father, Andrew McLeod was a professional fisherman; there was no greater fisherman than dad. He told me in past years here there were Murray cod, Catfish, yellowbelly though not much, the black bream were around. I did hear of a few grunter here, but never saw one. All the cod we caught here, they were the normal Murray cod. The other type was further up the river; we never saw them here in the lake. We fished all the backwaters, knew every stick, every log, fished up as far as where Mitchelton is now.

The Catfish there were a fair few around, quite a lot, beautiful to eat, they'd average about 4-5 pound, about 10 pound was the biggest we got. There were still quite a few around in the 40s, they got scarce after that. The black bream was also a good fish; we got them up to 4 pound. The Murray cod, we went after them with the spinner. Our market was for the Murray cod, didn't have to take any away to Melbourne, they were all sold locally. Mum was the fastest cleaner and scaler of fish. Mum used to lug them up and down the bank, after washing them. We caught them, the common size was 10-20 pound plenty of them, but we got them up to 70-80 pound. The biggest cod taken was 110 pound, but that is going back a long while. When the winter came it wasn't so good, you would catch the odd one, but not like you would catch them in summer. In 1916 there was the greatest flood in Nagambie. When there was a flood the cod could get all the tucker they wanted, they were harder to catch.

You could catch them any hour of the day. Dad went down early one morning; straight away he got a 37 pounder to start the day! That was our means of living. At lunch we would put a handline over the side, with a yabby. That was the best bait for the cod, and the redfin. I actually preferred the redfin. Real early on there were no redfin in the lake. It wasn't too many years later they came on the scene; they were cursed by the cod fishermen as before that there was so much feed for the cod. In the cod, well they ate yabbies, mainly; they would have small fish in them. They were cannibals, redfin and Blackfish were in them. You'd get tench, sometimes a bird in the cod. Got one with a snake in him one time. The cod used to scoop out hollows in the lake, near the willows, at the back of my place. We liked the windy days to spin for the cod; it broke the sunlight

up under the water. That's how got most of the cod, on a spinner with a feather on it. You could catchem any time of day. I gave it away in the early 80s; I was still catching cod then.

OH 131

Don Polkinghorne of Murchison East was interviewed in December 2007 at an age of 79 years.

My name is Don Polkinghorne; I'm seventy nine years old, born in Murchison, my father and mother were born in England. My father was a hairdresser in the town and was keen on being out in the open, he loved the river. There was a place called the Polkie's hole where they used to go swimming, that's where we left the boat to go fishing. The name of the boat was 'Largo'; it belonged to the local solicitor.

When I was a boy we mainly caught Murray cod, and yellowbelly. Nine times out of ten we'd throw the yellowbelly back. The fish that we caught back then they were three to four pounds. And grunters, you never kept them; the story goes they were no good to eat. There weren't many grunters in the river, not as many as there was in the lagoons. There were Catfish in the lagoons; I can't remember ever catching a Catfish out of the river. In the lagoons the Catfish were ugly slimy things, four to five pound, and the grunter they were about the same size. The Macquarie perch, they were just called a perch, they looked like a bream, we never caught them on the spinners, just on worm bait. The yellowbelly we got on worms too. The Macquarie perch were found in the lagoons were just called perch, they looked like bream, we never caught them on spinners, just on worm bait. The yellowbelly we got on worms too. The Macquarie perch there were a fair few around, but you just threw them back, we were only interested in the cod. The perch were usually about fourteen inches long, if you got one you seemed to get three or four.

Back then the average cod was seven to eight pound, the biggest ones, the biggest ones fifty pounds plus, well we never caught big fish. I've never bought one home ever in my life over thirty five pounds. The cod we mainly got on the old propeller spinners. A spinner on a ten foot bamboo rod with about ten foot of line off the rod. If you hooked something you threw the rod and everything back in then turned around in the boat and headed back to the rod. If it was still moving the fish was still on it. We always had white feather tail hook. I'd always have three or four in the bucket with the bardies, for the smell. The gully just down the river, we used to wait till the river rose to its full height. We used to drop the net in with big wings on it and we'd pull it up the next morning and got the cod and bream out of it, anything else, we threw them away.

I can't remember if there were two types of cod.... There was the one with bigger heads which could be as large as fifty pounds plus and the long trimmer ones, they came from further up the river. We usually only saw them after floods. That's the Trout cod that we caught then, back then they were usually up the river except after the floods, they're in the river here again now. The local cod was the stumpy ones; they were what we normally got. I remember when I hung a sheep's head off a tree limb; it got blown behind the football ground. I went back two or three days later and threw a line in and got cod and redfin. When I was very young there weren't a lot of redfin. They came in big numbers when I was about thirty five, they seemed to take over. The bream or Macquarie perch pretty well disappeared about then.

The holes in the river aren't like they used to be, they've all silted right up. Back when I was young it was a beautiful clean river, we used to go all the way down the river on a barge. The river boats used to come up the river as far as nearly Seymour in the early days, up to 'the crossing' at Mitchelton. I can go down and show you a spot, we called it Murray's hole, there was a beautiful big sandbar, and Campbell's fifty foot hole, there was a big sandbar there too, wasn't there ever! The holes with sandbars were mainly up the river. Now there's water weed right up to the edge of the water. The river used to be clear, after rains it would get a bit muddy, but not for long.

OH 132

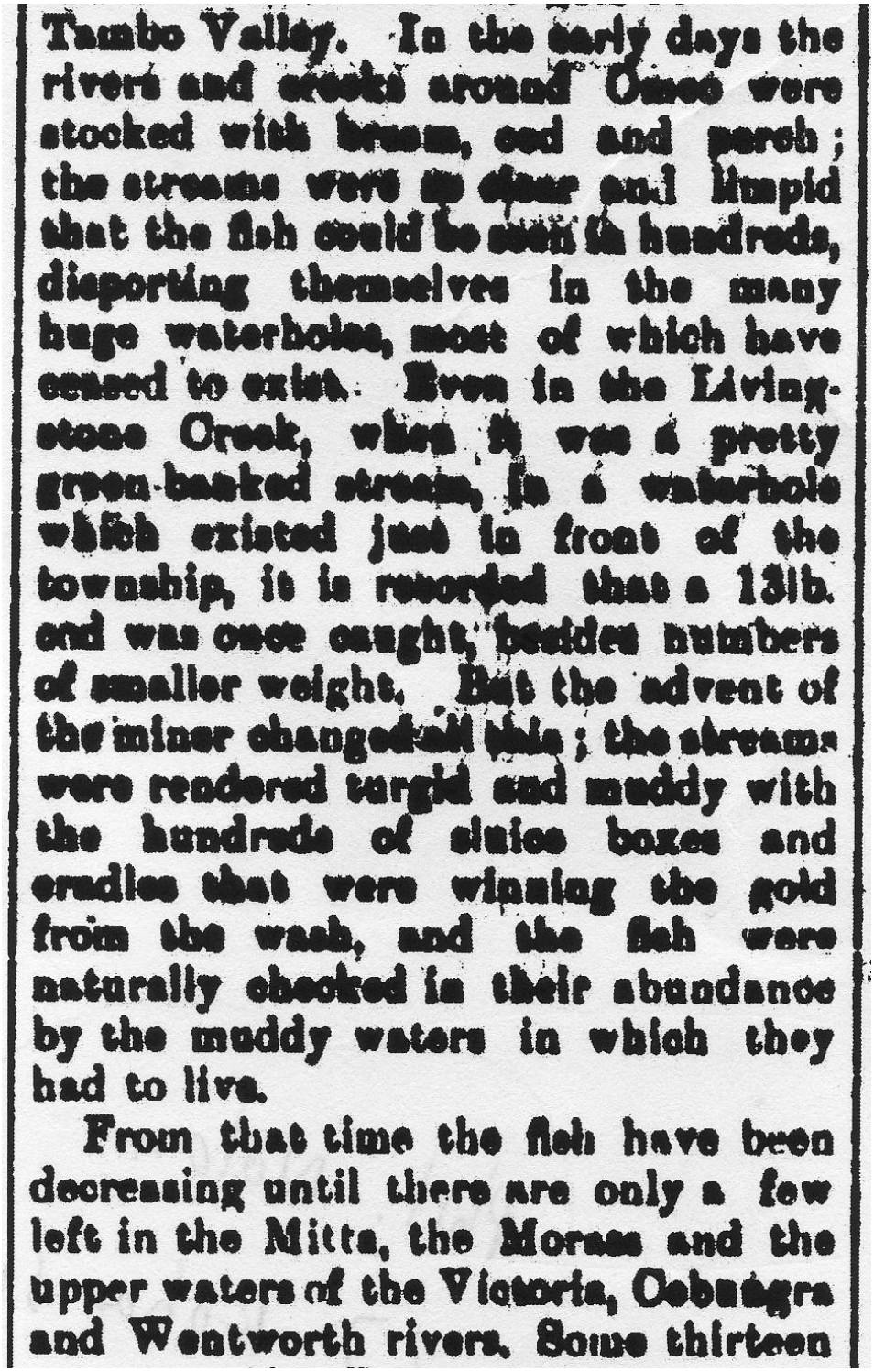
Ken Trefall of Shepparton was interviewed in February 2007 at an age of nearly 80 years.

I'm nearly 80, grew up here, same with my old man. He said how he used to be able to catch more fish than they wanted. When I was young the most common fish in the Goulburn here were the cod, the Murray cod. They were up to a hundred pound, back then you could get any size you wanted, there aren't so many big ones around now. They'll eat anything, golf balls; I've seen them with water rats in them. The Trout cod, they've always been there in the Murray, round Barmah, though years ago there was more Murray cod there than the Trout cod, a lot more. The biggest ones I saw there myself were 30 to 40 pound, though I've heard of them being caught bigger than that out of the Murray. Now there's too many Trout cod in the Murray, they've been stocking them. I only ever saw very few out of the Goulburn here when I was young, just odd ones. Since they stocked them they're catching them down here too, there was one caught a while back.

The yellowbelly were also very common, we used to get them out of the Nathalia Creek up to 13 pound. There was a ton of them here in the Goulburn. They had an open season on themselves, depending on the flow. You could catch any amount of them when they were on, from a pound up to 10 pound. The grunters were here, they were carpet sweepers. And they are worse now than they were back then. One fish I haven't seen for 30 years is the goggle eyes bream, they've died right out. They used to be in the Murray, and in all the creeks, up to 2 or 3 pound. They used to be common in the Goulburn here; they were real good to eat, not like the black bream or grunter. My old man said the goggle eyes was the best of the lot to eat.

The Catfish, there are still a few around in the Columbo Creek. You don't see them very often now around here, there used to be a lot of them in the lagoons; we used to get them up to 3 or 4 pounds, and in the channels. But they've drained everything out, emptied all the lagoons. The slipperies, when I was young they used to be common in all the channels around here, but they're not like they were. We got one that was stuck in the foot valve of a pump in a channel recently. The redfin, well the river used to be lousy with them, there used to be thousands from 2 to 3 inches long up to 4 or 5 pound, but there hasn't been the floods for them to breed. We never got many of the bony bream or herrings here, only a few, though there was plenty of them up in the Billabong Creek. There are still a few tench around, not as many as there were, there another useless fish. And those things a bit like a slippery, the loaches, well there's plenty of loaches in the channels.

9 Mitta Mitta River Catchment



Tambo Valley. In the early days the rivers and creeks around Omeo were stocked with bream, cod and perch; the streams were so clear and limpid that the fish could be seen in hundreds, disporting themselves in the many huge waterholes, most of which have ceased to exist. Even in the Livingstone Creek, when it was a pretty green-banked stream, in a waterhole which existed just in front of the township, it is recorded that a 13lb. cod was once caught, besides numbers of smaller weight. But the advent of the miner changed all this; the streams were rendered turgid and muddy with the hundreds of sluice boxes and cradles that were winning the gold from the wash, and the fish were naturally checked in their abundance by the muddy waters in which they had to live.

From that time the fish have been decreasing until there are only a few left in the Mitta, the Moroa and the upper waters of the Victoria, Cobungra and Wentworth rivers. Some thirteen

Omeo Standard, 2 December 1902

Tambo Valley. In the early days the rivers and creeks around Omeo were stocked with bream, cod and perch; the streams were so clear and limpid that the fish could be seen in hundreds, disporting themselves in the many huge waterholes, most of which have ceased to exist. Even in the Livingstone Creek, when it was a pretty green-banked stream, is a waterhole which existed just in front of the township, it is recorded that a 13lb cod was once caught, besides numbers of smaller weight. But the advent of the miner changed all this; the streams were rendered turgid and muddy with hundreds of sluice boxes and cradles that were winning the gold from the wash, and the fish were naturally choked in their abundance by the muddy waters in which they had to live.

From that time the fish have been decreasing until there are only a few left in the Mitta, the Morass and the upper waters of the Victoria, Cobungra and Wentworth rivers.

Omeo Standard, 2 December 1902

Figure 9.1 The Mitta Mitta River Catchment showing major waterways and key localities

9.1 Early European Accounts

The first European to sight the Mitta Mitta region was probably Johann Lhotsky in 1834. He recorded the existence of a wide plain containing a lake near the present Benambra, which was called by the indigenous people 'Homeo' (Lhotsky, 1979), though the term may have been the name of the local people (Clark, 2000). Modern historical publications state that the name Mitta Mitta means 'flowing flowing', the origin of which can be traced back to William Hughes' *Australian Colonies: Their Origin and Present Condition* (Hughes, 1852) a popular early work on Australia. The earliest detailed description of the lower Mitta Mitta comes from Lawrence Struilby who drove cattle into the lower valley in September 1842. Struilby provided probably the earliest origin for the name Mitta Mitta:

> The river Mitta Mitta takes its name from the marshes (Mitta Mitta – marsh marsh) through which it flows. One of these, five miles long, lay on the side of the river opposite our hut. It was separated from another of about three miles long by a sand-dyke or bar' (Graham, 1863).

Struilby described his stay in the region at length, providing much detail on the pristine environment and aboriginal practices. He recorded the breathtaking abundance of bird life that existed at the time:

> Swans, in the hot months, abounded on the river; for they came in from the dry lagoons to the water. Along the river, up towards the Snowy Mountains, you would find the finest water-fowl shooting in the world, I think. Ducks of all kinds, teal and native companions (a great large crane), geese and swans abounded in flocks; / Along the river you would see the great high-piled stick nests of the swans, so built on branches that they could rise or fall with the river. Their eggs were large and good; but very hard to get at, on account of the thorny scrub, the many serpents that infested them, and the deep water-holes over which they were built (Graham, 1863).

Struilby went on to provide the first account of the fish of the Mitta Mitta, describing the prolific nature of the fishery without actually identifying the species, and recalling fishing trips in a log canoe: 'There was fine fishing in the Mitta Mitta; It was most pleasant for Selina, Bobindi, and my-self to sit in it of evenings and haul up fish as fast as lines could lift them' (Graham, 1863).

In 1835, George McKillop and James MacFarlane travelled from the Monaro district in NSW to settle on the upper Mitta Mitta near Benambra (Andrews, 1920). The first description of the type of fish in the upper Mitta Mitta River is contained in the journal of George Augustus Robinson, Chief Protector of Aborigines of the Port Phillip District, who visited the Omeo region in 1844. His journal records that on the 26th of June he travelled to a property called 'Inme munje', owned by Edward Crooke who had acquired 'In-mi-mun-ji' (later Hinnomunjie) Station on the Mitta Mitta River (Clark, 2000). Contemporary sources differ in their interpretation of the meaning of the name Hinnomunjie. It has been widely quoted to mean a lack of fish (e.g., *Sydney Morning Herald,* 8 February 2004), though some local historians have disputed this and suggested that Hinnomunjie refers to an abundance of fish or more specifically cod (Max Dyer and Coral Kracke, pers. com.; www.tourisminternet.com.au).

Robinson recorded the name of Edward Crooke's station on the 'Mitte Mitte' River as 'Inme.munje' which he interpreted, along with other localities incorporating the phrase 'munjie', as being places where fish could be caught. In his list of indigenous words he defined 'munjie' as being fish (Clark, 2000). Evidence presented in court during a trespass case in 1860 included the pronunciation and meaning of indigenous terms for localities inhabited by the aborigines who employed the Yaithmathang (Gundungerre) language of the Omeo, upper Tambo and middle Snowy region. The newspaper reported that 'mungiu' (pronounced mung-yu) was a general

term for fish. The prefixes 'inna', 'tongiu' (pronounced tong-yu) and 'numla' it was stated referred to three specific species of fish. It was testified that 'the inna is the same fish with the Murray cod', but the account failed to identify the other two species (*Argus*, May 23, 1860). It is likely that these terms alone were the names of the three fish species, with 'munjie' possibly added by aborigines in their communication with Europeans to emphasise the type of animal they were discussing (Barry Blake, pers. com.). 'Tongiu' and 'numla' appear to have referred to fish species present in the coastal Tambo River catchment based on the subsequent naming of localities on that river (Clark, 2000; *Gippsland Times,* 10 September 1874). Collectively, the evidence suggests that the term 'Inme' or 'Inna' was employed by the Omeo aborigines for cod. Historical evidence indicates that Trout cod were common in the Hinnomunjie area, and that Murray cod were rare, suggesting that 'Inme' or 'Inna' was probably the aboriginal word for Trout cod near Omeo.

The early geologist and Minister W. B. Clarke published an account of his travels through the Monaro to the goldfields in the Omeo region in December 1851, providing names for a number of localities and features. Like Robinson before him he recorded: 'Mungee, another common termination, means "fish" (Clarke, 1860). Locations identified by Clarke by indigenous names which included the term mungee included 'Jugylmungee Creek' and 'Jugylmungee' Swamp referring to the Morass Creek and associated swamps. These names imply an abundance of fish (Clarke, 1860). Bingomunjie Creek, located between Hinnomunjie and Anglers Rest, appears to be another historical reference to fish in the upper Mitta Mitta catchment (Clarke, 1860; Clark, 2000).

Robinson's journal entries dispel the interpretation of Hinnomunjie referring to a lack of fish. On the 26th of June he recorded: 'stayed with Mr. Nial at Mr Crook's on main branch of Mitte Mitte at Inmemunje / The river at Crook is 29 yards wide is never dry in summer season it rises high. Plenty of cod fish in river'. On the 28th of June he recorded: 'Walked round the plain of Immemunje one and a half mile long half mile broad: beautiful place. Long reach still water / Mr Crook caught cod fish weighing eight pounds. I eat of some'. On Saturday June 29, Robinson made reference to 'perch cod' being found towards the source of the Mitta Mitta River. This implies the presence of cod, and possibly perch in areas of the Mitta Mitta River upstream of Hinnomunjie at the time of European settlement.

In 1851, gold was discovered in the Livingstone Creek and, while initially kept quiet, eventually a rush developed. By the end of 1854, there were at least 180 men working on the Livingstone Creek at a location which became known as Omeo (Flett, 1979). One of the miners was Frank Shellard who recorded in exercise books many incidents, and who described the indigenous residents fishing in the Mitta Mitta River near the Gibbo River junction (Shellard, 1890). The *Omeo Standard* recorded that prior to the gold rush there was an abundance of fish in the upper Mitta Mitta River and its tributaries:

> In the early days the rivers and creeks around Omeo were stocked with bream, cod and perch; the streams were so clear and limpid that the fish could be seen in hundreds, disporting themselves in the many huge waterholes, most of which have ceased to exist. Even in the Livingstone Creek, when it was a pretty green-banked stream, in a waterhole which existed just in front of the township, it is recorded that a 13 pound cod was once caught, besides numbers of smaller weight (*Omeo Standard*, 2 December 1902).

In 1922, H. G. Marsden, editor of the *Omeo Standard*, published *Across the Alps to Omeo* to celebrate the 50th anniversary of the shire and to promote tourism. He reported the recent capture of a 9lb. 2oz. cod from the Mitta Mitta River and went on to describe other fishing options in the region:

> Another favourite ground with local anglers is on Big River at Coolgardie and at Mitta Mitta River, past Hinnomunjie Bridge, where good-sized cod have been caught. The Morass Creek, both upper and lower, either to the right or left of Benambra township, have been good fishing grounds for many years past, cod and perch being obtained in addition to trout (Marsden, 1922).

After the Second World War, and the progressive harnessing of the Murray's waters for irrigation, the Mitta Mitta became the subject of plans by the River Murray Commission for the construction of a vast impoundment to store its waters just below the Dart River junction. Work commenced on the Dartmouth Dam in 1973, and as part of the work an environmental impact study was conducted. It was found that the lower Mitta Mitta River contained important populations of Murray cod, Macquarie perch and a relic population of Trout cod which had recently been identified as a distinct species (Tunbridge, 1977). During the course of surveys in 1973, a Trout cod was taken from the Mitta Mitta River just upstream of the Dart River junction. Another fish was captured by a local angler several kilometres further upstream, and a third was captured from the Mitta Mitta River just downstream from the Watchingorra Creek junction near the town of Mitta Mitta. In addition, it was recorded that local anglers caught two adult Trout cod from the Mitta Mitta River upstream of the Dart River junction (Tunbridge, 1977).

9.2 The Past Distribution of Fishes in the Mitta Mitta River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the Mitta Mitta catchment into a slopes zone (downstream from Banimboola, below Dartmouth Dam), an upland zone (upstream to Anglers Rest, Omeo and Benambra) and a montane zone beyond the latter locations. The river between Banimboola and the town of Mitta Mitta traverses a highly confined valley without a significant floodplain, indicating that upland habitat continues some distance downstream of that nominated in the *Sustainable Rivers Audit*. For simplicity, all habitat zones discussed below match those in the *Sustainable Rivers Audit.*

Much of the information presented below is sourced from the writings of early European settlers, oral history (mainly OH 77-93) and a number of detailed newspaper accounts. A relatively small number of old photographs of catches of native fish in this catchment have been located with at least one being of significance.

9.2.1 The Montane Zone

Macquarie perch ('white eye') and Trout cod ('bluenose') were reported by Jack 'Grandpa' Pendergast to have been common in the Big River at the dawn of the twentieth century where it was sometimes possible to: 'catch enough bluenose and white eye on the first night to be on the way home in the pre-dawn chill of the next day' (Pendergast, OH 77) suggesting that at times good catches were taken. Fisheries Inspector Jack Rhodes obtained a very good description of the cod from Jack Pendergast, and was in no doubt that they were Trout cod (Jack Rhodes, pers. com.). Local advice has pinpointed the location of these captures as occurring in the Big River between Glen Valley and Shannonvale, and clearly in the montane zone (Jack Rhodes, Max Dyer & Sonny Betts, pers. com.). Other oral accounts also record the existence of cod in the Big River further upstream near Glen Wills, and a short distance downstream near Anglers Rest, though these reports do not identify the species (Pendergast, OH 91; Turnball, OH 92). The presence of cod in the Anglers Rest area of the Big River, the upper reaches of the Mitta Mitta River, and the lower reaches of the Cobungra and Victoria Rivers up to waterfall barriers is suggested by two newspaper articles (*Argus*, September 17 1860; *Omeo Standard*, 2 December 1902). Robinson (Clark, 2000) also indicated that cod were found upstream of

Hinnomunjie towards the source of the Mitta Mitta River, and a tourism publication suggested the presence of cod in the Big River at Coolgardie (Marsden, 1922).

At the bottom of the montane zone, in the Livingstone Creek at Omeo, cod and bream were common and could be seen in their hundreds with cod up to 13 lb. (5.9 kg) being taken (*Omeo Standard*, 2 December 1902). Macquarie perch were common in the montane zone of the Morass Creek upstream of Benambra (Hollands, OH 79), and while it has been suggested that cod were not found that far upstream in the Morass Creek (Pendergast, 1968), oral history supported by a written account, indicates that cod had a presence above Benambra (Hollands, OH 79; Dyer, OH 83; Marsden, 1922).

Blackfish were present in the montane zone in the Big River where Henry Morgan recorded catching a 'few', eight miles upstream from the 'Bundarra Creek' (Morgan, 1908). They have been reported more recently from the Bundarra River (Tunbridge, 1977). A newspaper article detailed the capture of a Blackfish from the Livingstone Creek at Omeo and indicated their presence further upstream (*Omeo Telegraph*, 17 September 1895). They had also been common in the upper Morass Creek but not caught in very large numbers (Bill Hollands, pers. com.).

The oral history, combined with a number of written accounts, indicate that at the time of European settlement Macquarie perch, Blackfish and cod had significant populations at the very bottom of the montane zone in the lower reaches of the large rivers and the Livingstone and Morass Creeks. While there is limited descriptions of the size of the catches, the available evidence records that that they were regularly captured, indicating that they were reasonably common. Only one account clearly identifies the species of cod as Trout cod (Pendergast, OH 77). An oral account, supported by a photograph, indicates that in the upland zone near Benambra most cod taken were Trout cod, and that Murray cod were rare (Pendergast, OH 78; MMR5). This also suggests that most of the cod in the montane zone were Trout cod.

9.2.2 The Upland Zone

Robinson recorded 'Plenty of cod fish in river' at Hinnomunjie, indicating that cod were common near the top of the upland zone (Clark, 2000). Their presence in the area is supported by a number of other written and oral accounts (Marsden, 1922; Dyer, OH 83; Pendergast, OH 78; Turnball, OH 92). Near the Gibbo River junction in the 1920s, most of the cod taken were Trout cod, with Murray cod uncommon, and typical catches being three to four fish (Pendergast, OH 78). The presence of Trout cod was confirmed by two specimens taken upstream of the Dart River junction during a scientific study in 1973 (Tunbridge, 1977). A photograph of a cod, while not showing detail in terms of markings, clearly shows head features typical of the fish, notably the lengths of the upper and lower jaws. This photo confirms their presence near the Gibbo River junction (MMR5). Cod were also present in the upland zone of the Morass Creek where it was recorded that one hole was 'full of Murray Cod fish' (Pendergast, 1968). In the lower Gibbo River Trout cod were common (Pendergast, OH 78).

Towards the bottom of the upland zone at the Dart River junction and Banimboola, both species of cod were regularly taken, though Trout cod were originally more common (Walsh, OH 83; Murtagh, OH 85; Franks, OH 89). Until the early 1930s, significantly more Trout cod than Murray cod were caught, particularly fish less than ten lb. (4.5 kg) in weight. Typical catches were two to three table sized fish, with a greater number of juveniles. Cod over 15 lb. (6.8 kg) were unusual, and fish exceeding 10 lb. (4.5 kg) were usually Murray cod (George Murtagh, pers. com.). The collective evidence indicates that in the upland zone Trout cod had been very

common, and in places perhaps locally abundant, while Murray cod varied from being reasonably common to rare - their abundance declining progressively upstream.

Macquarie perch were reported by a number of witnesses to have been caught in large numbers from the Mitta Mitta River near Dartmouth (Walsh, OH 83; Murtagh, OH 85; Scales, OH 88; Turnball, OH 92) and further upstream huge schools were sometimes seen (Turnball, OH 92). Small fish were considered a pest in the late 1920s, with typical catches including half a dozen fish of table size (George Murtagh, pers. com.). Pendergast (1968) recorded: 'Fish, mainly perch and a small blackfish, known locally as a 'greasy', inhabited most of the streams and, for some miles up most of the larger creeks that flowed eventually into the Mitta Mitta River'. Macquarie perch are recalled in oral history to have been abundant in the Morass Creek (Hollands, OH 79; Betts, OH 82), common in the lower Dart River (Murtagh, OH 85; Scales, OH 88; Turnball, OH 92) and at times present in Larsen Creek (Walsh, OH 83). The fish were absent from very small streams such as the Soldier and Tokes Creeks (Walsh, OH 83). On one occasion it was recorded that a catch of Macquarie perch from the Morass Creek filled a baby's bath, indicating that they were abundant in that stream (Dyer, OH 83). Overall, the collective evidence indicates that Macquarie perch were abundant in the larger waters of the upland zone.

Blackfish were widespread in the creeks in this zone (Pendergast, 1968) and recorded at a number of locations by Tunbridge (1977). They were caught in good numbers from the Morass Creek downstream from Benambra (Betts, OH 82; Sonny Betts, pers. com.). In the Mitta Mitta River near the Dart River junction they were commonly captured, and in the smaller creeks were abundant (Murtagh, OH 85; George Murtagh, pers. com.). They have also been recorded in the middle reaches of the Gibbo River (Tunbridge, 1977). In the lower reaches of the upland zone near Banimboola, a number of individuals witnessed the capture of small numbers of Silver perch (Walsh, OH 84; Murtagh, OH 85; Scales, OH 88) with reports of the fish as far upstream as the Dart River junction (Murtagh, OH 85). Two people who were shown unlabelled photographs identified the fish concerned as Silver perch. These independent oral accounts indicate that Silver perch were present in the lower reaches of the upland zone and caught at intervals in small numbers. Overall, however, this fish was rare in the upland zone.

9.2.3 The Slopes Zone

Oral history recalls that cod had been abundant in the Mitta Mitta River in the early years, and at times large catches were taken (Yea, OH 86; Franks, OH 89; Turnball, OH 92). In the 1920s, it was not uncommon to catch half a dozen cod in an evening at Tallangatta (Jack Moyle, pers. com.). Both Trout cod and Murray cod were abundant, but originally Trout cod are reported to have been a little more common near Mitta Mitta (Stan Walsh, pers. com.). In the early 1940s, at the top of the slopes zone between Mitta Mitta and Banimboola, Trout cod were estimated to have been half of the total cod catch (Yea, OH 86). A number of rare photographs depict large catches of cod from the river near Mitta Mitta (THS1; THS5; THS6). While the image quality in these old photos is poor, in one some fish have features suggesting that they could be Trout cod (THS5). Cod were common in the lagoons (Walsh, OH 85; *Argus,* 16 February 1912; 3 January 1922) and on one occasion a 24 lb. (10.9 kg) fish was taken with a hayfork (*Argus,* 25 September 1922). Trout cod were not present in lagoons (Stan Walsh, pers. Com.) Cod were also present in the Tallangatta Creek where they were fairly common into the upper reaches (Turnball, OH 92; Alec Turnball, pers. com.). Trout cod were not present in this area (Stan Walsh, pers. com.).

All oral accounts suggest that Macquarie perch had been abundant in the slopes zone of the Mitta Mitta River, being reliably caught in numbers (Yea, OH 86; Franks, OH 89; Turnball, OH 92) and at times dominating catches (Moyle, OH 93; Jack Moyle, pers. com.). They were common in the lower reaches of the Snowy Creek (Scales,

OH 88; Turnball, OH 92), and were present further upstream in the west branch (Yea, OH 86). Blackfish were very common in the river near Mitta Mitta (Walsh, OH 84) where it was not unusual to catch three to four fish (Stan Walsh, pers. com.). They had been abundant in the Tallangatta Creek (Turnball, OH 92), the Snowy Creek (Pendergast, OH 91; Tunbridge, 1977), the Little Snowy Creek (*Argus*, 1 November 1929; Tunbridge, 1977) and in lagoons near Mitta Mitta (Walsh, OH 84).

Many people recalled Catfish being present in lagoons adjacent to the Mitta Mitta River (Franks, OH 89; Evans, OH 90; Turnball, OH 92; Moyle, OH 93), and their presence is supported by two newspaper accounts, one originating from Bonegilla, and one upstream of Tallangatta, where they were reported to 'abound' (*Argus,* 16 February 1912; 3 January 1922). One of the oldest anglers confirmed that Catfish were taken from the Mitta Mitta River itself during floods (Stan Walsh, pers. com.), and another recalled his father's stories of them being taken from the river near Tallangatta, Eskdale and Mitta Mitta (Franks, OH 89). Overall, Catfish appear to have been very common in the lagoons, but were taken only in small numbers from the Mitta Mitta River.

Oral accounts indicate that Silver perch were regularly caught in small numbers from the Mitta Mitta River near Mitta Mitta, Yabba and Tallangatta (Walsh, OH 83; Turnball, OH 92; Moyle, OH 93). Some of the anglers were careful to distinguish them from the Macquarie perch, and when shown photographs identified the fish as Silver perch, highlighting a number of features including the forked tail. One individual recalled that they were taken regularly in the Yabba area, and clearly indicated that they were different from Macquarie perch (Turnball, OH 92). A newspaper account distinguished 'silver bream' from 'perch', which were dying in numbers in lagoons near Bonegilla (*Argus,* 16 February 1912), however this account does not conclusively identify the species. The oral history alone is sufficiently strong to suggest with confidence that Silver perch were taken in small numbers with some regularity and may, from the newspaper account, have been fairly common in the lower reaches.

Golden perch were present in the Mitta Mitta River, with a single individual recalling catches in the 1920s downstream of Tallangatta (Moyle, OH 93). Their presence is confirmed by a newspaper article recording the capture of a large specimen from a lagoon near old Tallangatta. This article also implied that it was not an isolated incident (*Argus,* 4 July 1924). The available evidence indicates that they were rare and confined to the lower reaches of the slopes zone.

9.2.4 Estimates of Native Fish Abundance in the Mitta Mitta Catchment at European Settlement.

Presented below are the rarity scores used in the *Sustainable Rivers Audit* (Davies *et al.,* 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 9.1 Mitta Mitta River Catchment Rarity Scores

	Slopes (Murray River to Banimboola)		**Upland** (Banimboola to Benambra, Omeo & Anglers Rest)		**Montane** (Upstream of Benambra, Omeo & Anglers Rest)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod	3	**5**	3	**U3**	0	L3
Murray cod	3	**5**	1	**U1**	0	L1?
Golden perch	1	**L1**	0	0	0	0
Silver perch	0	**1**	0	**L1**	0	0
Macquarie perch	5	**5**	3	**5**	1	3
Catfish	0	**U1**	0	0	0	0
'Blackfish'	3	**U3**	5	**5**	5	U3

Key

0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type are supported by multiple accounts or lines of evidence e.g. oral history, newspaper accounts, photographs.

Figure 9.2 Historical Records for Murray cod and Trout cod in the Mitta Mitta River Catchment

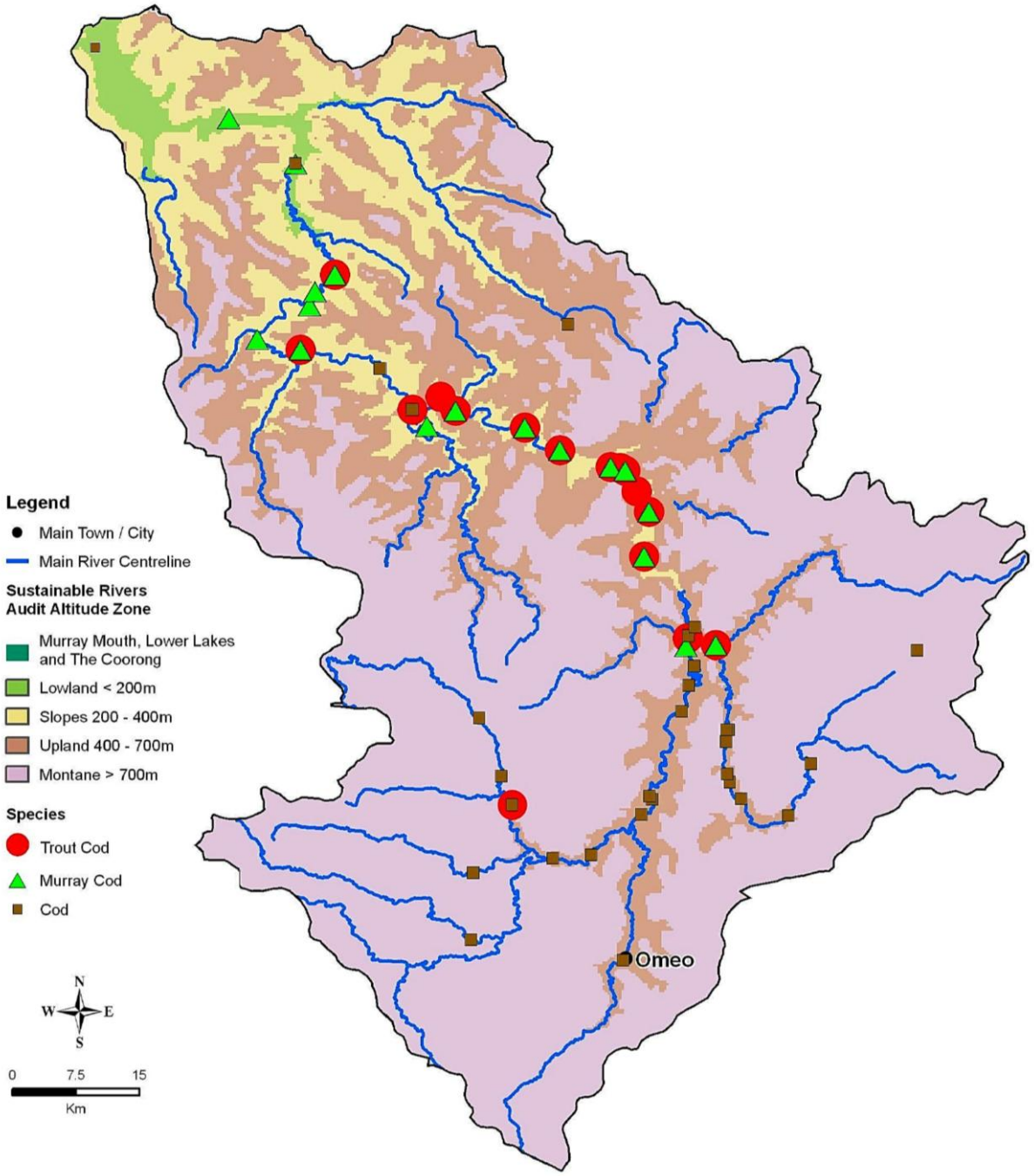
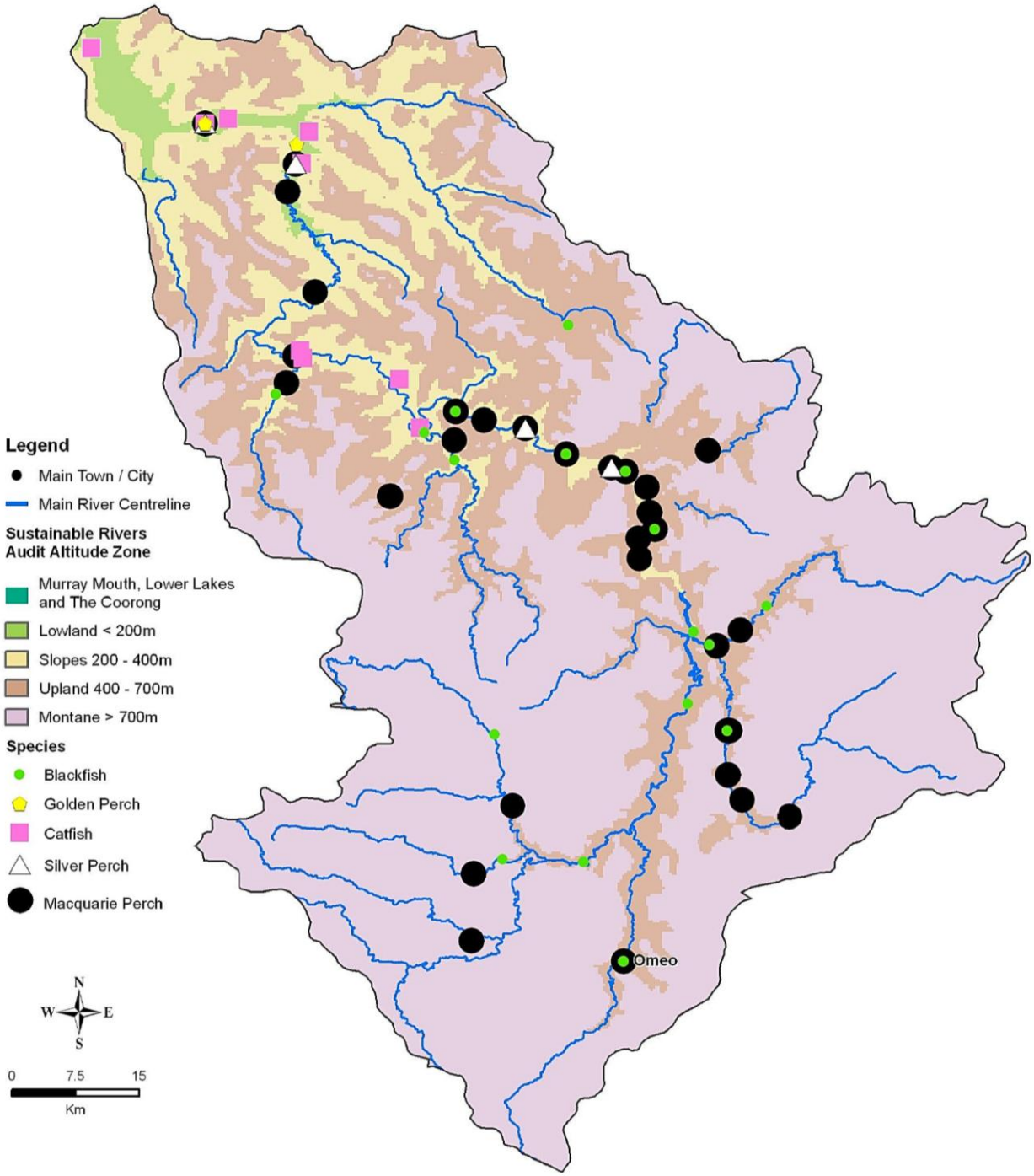
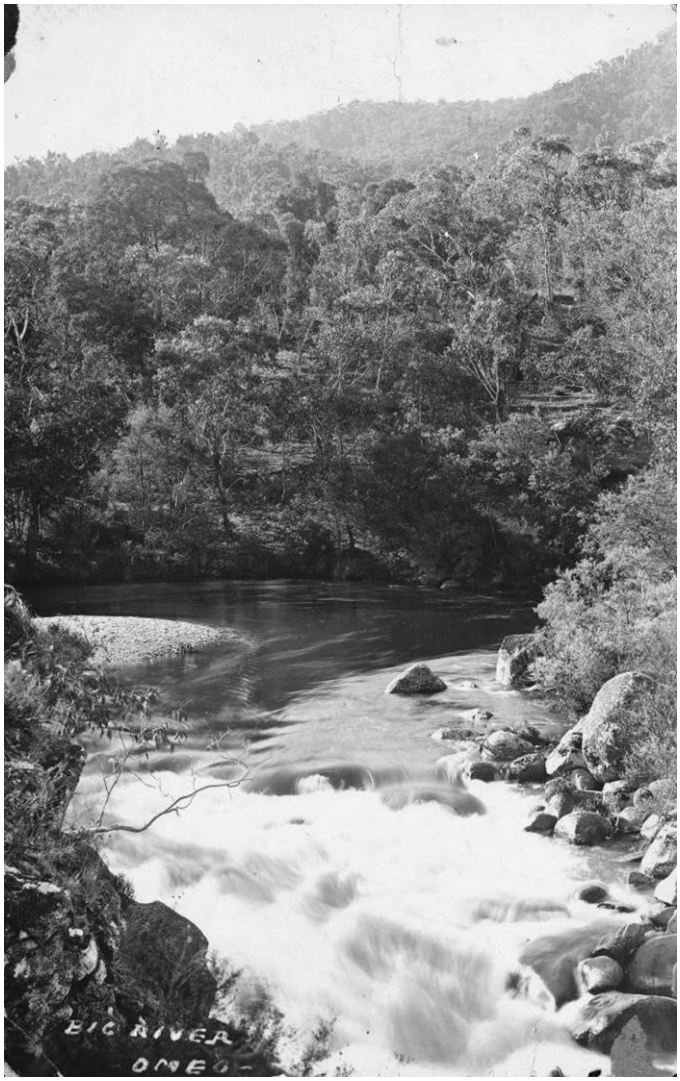


Figure 9.3 **Historical Records for Native Fish Species other than Cod in the Mitta Mitta River Catchment.**



Photograph 9.1 The Big River



A Photograph of the Big River near Omeo at the dawn of the twentieth century depicts the habitat where Jack 'Grandpa' Pendergast recalled fishing for bluenose and white eye at that time. Photograph from the Shirley Jones collection of Victorian Postcards, reproduced with the permission of the *State Library of Victoria*.

Photograph 9.2 Upper Mitta Mitta Trout Cod

Photo MMR5: Gordon Toland at 'the goat farm', Gibbo Park, holding a Trout cod caught from the Mitta Mitta River just upstream of the Gibbo River junction c1935. The overhanging upper jaw is quite apparent, the snout is large and pointed and the animal has a very long caudal peduncle. While the image is too grainy to record most markings an eye stripe is visible. Stories from the Tolands and Pendergasts recall that Trout cod were once very common in the upland Mitta Mitta and Gibbo Rivers near Benambra and Murray cod rare. Photo courtesy of Margaret Pendergast.

Photograph 9.3 Mitta Mitta Cod Catch

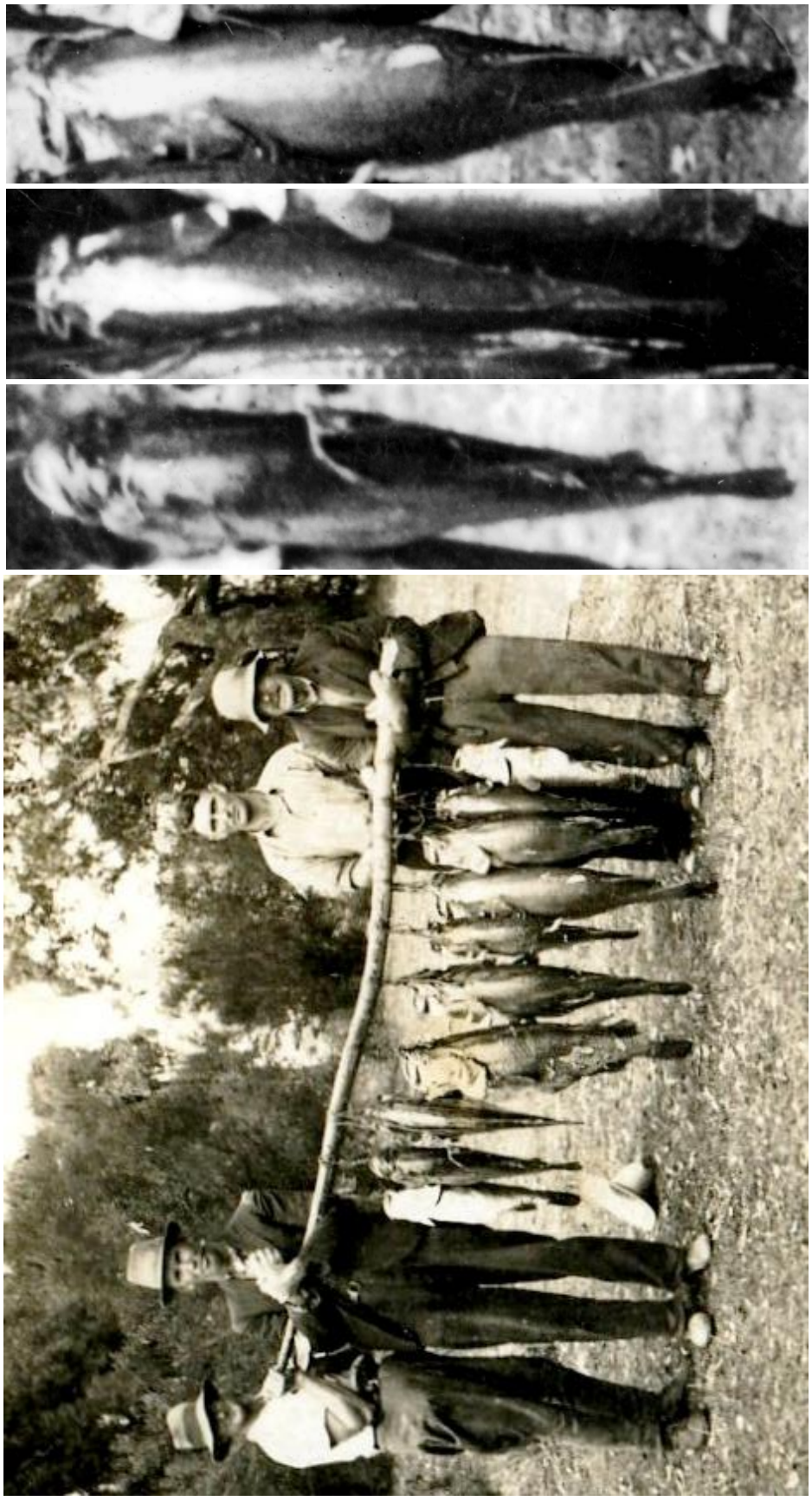
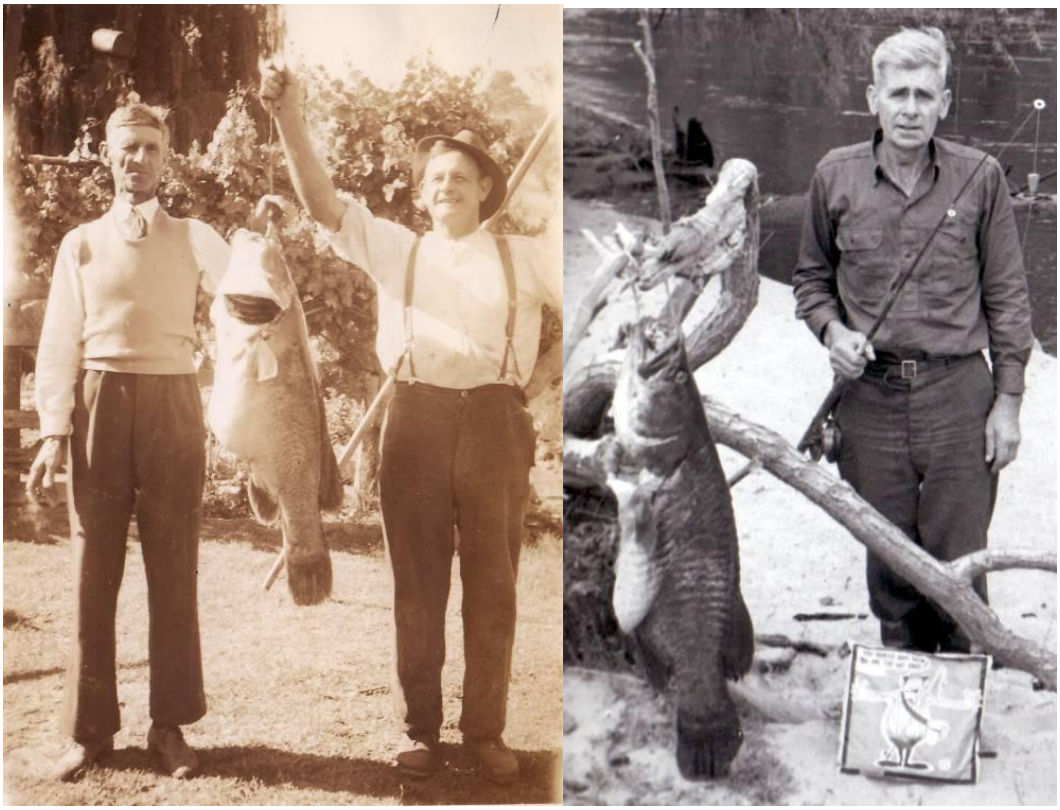


Photo THS5: A catch of cod from the Mitta Mitta River near Mitta Mitta c1930. Though not conclusive differences in the shape of the heads and other features suggests that both Murray cod and Trout cod may be present in the catch. On the far left of the original photo is Arch Campbell. The photo demonstrates that cod were abundant in the slopes zone of the Mitta Mitta River. From the collection of Joe Campbell, reproduced with the permission of the Tallangatta & District Historical Group.

Photograph 9.4 Big Cod from the Mitta Mitta



Left, Photo MMR14: A Murray cod captured from the Mitta Mitta River near Old Tallangatta c1940. Left is Ben Butler and on his right Ern Butler, both keen fishermen. Photo courtesy of Beverly Stewart.

Right, Photo MMR13: By the 1960s native fish populations in the lower Mitta Mitta River were a shadow of the past. Sizeable Murray cod were still being caught along with occasional Trout cod and Macquarie perch. Jack Franks here is depicted with a 40 lb. (18.2 kg) Murray cod caught from the Mitta Mitta River near Tallandoon 19 December 1964. Photo courtesy of Les Franks.

9.3 The Changes

9.3.1 Changes to Native Fish Distribution and Abundance

Trout cod and Macquarie perch populations had disappeared from many areas in the montane zone by the end of the nineteenth century, with reasonable numbers existing in the more isolated areas (*Omeo Standard*, 2 December 1902; Pendergast, OH 77). Macquarie perch were still present in small numbers upstream of Benambra until the 1930s, (Bill Hollands, pers. com.) but the species had disappeared earlier from the Mitta Mitta River and tributaries upstream of Hinnomunjie, with no one recalling their presence (Pendergast, OH 91; Turnball, OH 92). Isolated captures of cod continued in the Big River and near Anglers Rest, until the end of the 1950s (Pendergast, OH 91; Turnball, OH 92).

Early in the twentieth century, native fish populations in the upland zone of the Mitta Mitta River appear to have been in reasonably good shape. The lower Morass Creek was still producing good catches of cod and Macquarie perch (Pendergast, OH 78; Hollands, OH 79; Betts, OH 82; Dyer, OH 83), and in the lower Morass Creek as late as 1926, cod from one to 25 lb. (11.36 kg) were taken (*Camperdown Chronicle,* 14 January 1926). Until the early 1930s, the Mitta Mitta River in the Dartmouth area contained an abundance of Trout cod, Murray cod and Macquarie perch (Murtagh, OH 85). As late as 1923, a catch of 70 lb. (31.8 kg) of bream and cod was reported as being taken from 'some of the less frequented fishing grounds' near Omeo (*Argus,* 5 February 1923).

By the late 1930s, the cod population in the upland zone was in serious decline with catches having become rare in the Morass Creek, Gibbo River and the Mitta Mitta River above Tokes Creek (Pendergast, OH 78; Hollands, OH 79; Betts, OH 82; Dyer, OH 83). During the 1930s, at the bottom of the upland zone at Dartmouth small cod were less common, and Trout cod significantly declined (Murtagh, OH 85; George Murtagh, pers. com.). The Macquarie perch population also reduced (George Murtagh, pers. com.). By the Second World War cod were rare upstream of the Dart River junction, and Macquarie perch rare above Larsens Creek (Murtagh, OH 85; Walsh, OH 84; Dyer, OH 83; Pendergast, OH 91).

In the slopes zone of the Mitta Mitta River during the 1920s, good populations of Trout cod, Murray cod, Macquarie perch, Catfish and Blackfish were still present, with regular captures of Silver perch taking place (Walsh, OH 84). Major changes to fish populations are apparent by the end of the 1930s. Catfish disappeared (Evans, OH 90; Turnball, OH 92; Moyle, OH 93), and there are no further accounts of Golden Perch and Silver Perch, indicating that they had also vanished. There was a reduction in catches of both cod species, though the cod fishing was still considered to be good in the late 1930s. It was noted however, that the large numbers of juvenile cod in past years had declined near Mitta Mitta (Stan Walsh, pers. com.). By the 1950s, the fishing for large cod was still good, but they were nowhere near as prolific as in the past. Trout cod had dramatically declined in abundance, being only occasionally caught, and Macquarie perch had become scarce throughout the slopes zone (Yea, OH 86; Yea, OH 87; Franks, OH 89; Evans, OH 90; Stan Walsh, pers. com.; Jack Rhodes, pers. com.).

By the 1970s, Blackfish survived as small populations throughout the catchment. Macquarie perch were present in numbers near the Dart River junction, but were rare elsewhere. Murray cod were found in numbers downstream of Eskdale, and present as far upstream as the Dart River junction. A relic population of Trout cod existed in the Mitta Mitta River between Larsen Creek and Mitta Mitta (Tunbridge, 1977). After the filling of Dartmouth Dam, Macquarie perch initially flourished in its waters, as well as in the Mitta Mitta as far upstream as the Livingstone Creek junction. In subsequent decades they have declined, and are now caught in comparatively low numbers from the dam (Douglas *et al.,* 2002). While one or two cod captures occurred from the waters of Lake Dartmouth, it appears that too few fish were present to make use of the favourable

conditions. Downstream of the dam the populations of the larger native fish species have almost disappeared (Koehn *et al.,* 1995).

9.3.2 Changes to Habitat

The 1850s gold rush caused massive destruction to the aquatic environment of some waters in the catchment. Mining activities seriously impacted water quality and this is implicated in the decline of fish populations (*Omeo Standard*, 2 December 1902). Disturbance of the sediments, along with land clearing, allowed the serious flooding of 1870 to shift large volumes of sediment into and down the river, filling in holes in the upper Mitta Mitta River (Flett, 1979). In the early part of the twentieth century, bucket dredging occurred in the Hinnomunjie area and near Mitta Mitta, turning over large volumes of gravel in the river (Flett, 1979). By 1915, sluicing and dredging operations near the town of Mitta Mitta area led to the creation of a three mile long sand slug just downstream of Tallangatta (Victorian Government, 1915). The alluvial workings in the lower Mitta Mitta River impacted upon water quality from time to time, with effects observed downstream in the Murray River at Albury (NSW Fisheries Report, 1907).

After unsuccessful attempts at acclimatising Atlantic Salmon, Brown and Rainbow trout were introduced to the Mitta Mitta Catchment near Omeo, Anglers Rest and Benambra in 1902 (*Omeo Standard*, 2 December 1902). Three years later a newspaper article described how in the Victoria River the trout 'were thriving, thousands of yearlings and a large quantity of spawn present' with the fish being fed by locals (*Omeo Standard,* 21 November 1905). Periodic trout liberations from government hatcheries occurred up to 1969 (Tunbridge, 1977). Trout dispersed downstream reached the Dartmouth area during the 1920s (Murtagh, OH 85; Moyle, OH 93), and by the 1930s were abundant in the Mitta Mitta River, its tributaries, and lagoons as far downstream as the Eskdale area (Walsh, OH 84; Franks, OH 89; Stan Walsh, pers. com.). Their arrival at Dartmouth caused apprehension amongst anglers who believed that they would have an impact on native fish (Murtagh, OH 85).

Redfin perch were first reported in the catchment in 1917 (*Argus,* 23 January 1922), and became common as far upstream as Banimboola by the early 1930s (Murtagh, OH 85; Moyle, OH 93). They penetrated upstream into the lower reaches of the Dart River (Alec Turnball, OH 92; Tunbridge, 1977) and are recorded as having been present as far upstream as the Razorback Spur area (Tunbridge, 1977). Great concern was expressed by anglers at the time. The arrival of Redfin perch in the slopes zone was associated with a decline in native fish - particularly Catfish and Macquarie perch (Murtagh, OH 85; Yea, OH 86; Jack Moyle, pers. com.).

It is uncertain when Goldfish first arrived in the catchment, but in 1922 'vast numbers' were stranded by a flood near Tallangatta (*Argus,* 7 July 1922). By the 1930s, they were present in the slopes and upland zones, and were widely used as bait by anglers (Franks, OH 89). English roach were recorded as present near Tallangatta in 1922, but failed to establish a significant population (*Argus*, 3 January 1922). European carp were first reported in the slopes zone at the end of the 1970s (Les Franks, pers. com.). They appeared in Dartmouth Dam at the end of the 1980s where they became abundant, and have been sighted in the Livingstone Creek near Omeo (Author's pers. obs.). Their arrival near Tallangatta was associated by one person with a decline in water quality (Turnball, OH 92; Alec Turnball, pers. com.).

In 1919 and 1926, bushfire events followed by storms, are reported to have killed large numbers of fish (*Queanbeyan Age & Queanbeyan Observer,* 28 February 1919; *Argus,* 15 January 1926). The 1939 bushfires are recalled to have affected fish populations in the slopes and upland zones, with large fish kills taking place (Murtagh, OH 85; Betts, OH 82; Sonny Betts, pers. com.). After the kills, cod which were already rare,

disappeared from the Morass Creek. Macquarie perch, still regularly caught, did not recover (Betts, OH 82; Sonny Betts, pers. com.). Subsequent to the fires there was a noticeable decline in native fish populations in the lower Mitta Mitta (Murtagh, OH 85, George Murtagh, pers. com.). The construction of the Hume Dam during the 1920s isolated the Mitta Mitta Catchment from most of the Murray-Darling Basin, creating a barrier to upstream fish movement. During the 1950s and 1960s 'river improvement' works, carried out by government agencies, removed snags and logs from the river destroying habitat considered important for cod (Franks, OH 89; Tunbridge, 1977).

Work commenced on the Dartmouth Dam in 1973 (Tunbridge, 1977), filling of the storage commenced in 1977, and construction was completed two years later. Downstream of the dam the natural flow regime has been altered and cold water releases have greatly depressed summer water temperatures with impacts felt downstream to Lake Hume (Ryan *et al.,* 2001). The lowered thermal regime has been suggested as responsible for the extinction of the downstream populations of Murray cod, Trout cod and Macquarie perch, whilst enhancing the trout population (Koehn *et al.,* 1995). However, by the time the dam was constructed, Trout cod and Macquarie perch were already rare in the slopes zone.

9.4 The Current Situation

The Sustainable Rivers Audit concluded that 'the Mitta Mitta Valley fish community was in Extremely Poor Condition. Alien species were 92% of total biomass and 50% of total abundance. The community had lost most of its native species richness and was dominated by alien fish' (Davies et al., 2008).

Today the Mitta Mitta catchment is recognised as one of the best trout fisheries in Victoria. Blackfish are widespread, and in some areas are relatively common. During the filling phase of Dartmouth Dam, Macquarie Perch flourished, creating a fishery for the species on a scale not seen anywhere else for several decades. The population declined after the lake stabilised, but persists both in the lake and the Mitta Mitta River as far upstream as Hinnomunjie. Cod all but vanished downstream of the dam, though in recent years, when water levels in the dam have been low and irrigation releases warmer, some isolated catches have taken place. Occasional catches of Golden perch have also occurred in the lower reaches, probably originating from fish stocked into Lake Hume. Catfish and Silver perch have not been reported for over 70 years.

'Inme-mun-je' or 'Inna-mung-yu' are probably historical references to Trout cod being common in the area now known as Hinnomunjie. Once prevalent in the Mitta Mitta River, but scarce after the 1950s, they became extinct in the catchment after the completion of Dartmouth Dam. During the early 1990s a program commenced for five years to stock Trout cod in the dam, and the Mitta Mitta River near Taylors Crossing, however, the stockings were discontinued after two years to concentrate resources on re-establishing the species in the Ovens Catchment. There are ongoing reports of occasional captures, but a population has not as yet been established.

9.5 Newspaper Highlights

Omeo Telegraph, 17 September 1895
It was reported that a local Omeo resident caught a blackfish a foot in length and 8 ½ inches in girth in the old upper race near his house. This particular race, one of many within the Omeo township, had its beginnings at the upper Livingstone some 6 km from Omeo. It would seem that the fish entered the race at this point.

Omeo Standard, 2 December 1902
Omeo Fish Society
It is easy to distinguish a visitor from Omeo at a Bairnsdale or Melbourne hotel dining table by the constant demand he makes for fish; he asks for it for breakfast, dinner and but the small waiter who is looking after his capital welfare makes it his business to see that a portion of the much coveted luxury is kept back for his customer. The tinned varieties and occasionally during the winter some fresh fish at some of the Omeo hotels is all that the Omeoite knows of the succulent food until he goes down the Tambo Valley. In the early days the rivers and creeks around Omeo were stocked with bream, cod and perch; the streams were so clear and limpid that the fish could be seen in hundreds, disporting themselves in the many huge waterholes, most of which have ceased to exist. Even in the Livingstone Creek, when it was a pretty green-banked stream, in a waterhole which existed just in front of the township, it is recorded that a 13 lb. cod was once caught, besides numbers of smaller weight. But the advent of the miner changed this; the streams were rendered turgid and muddy with the hundreds of sluice boxes and cradles that were winning the gold from the wash, and the fish were naturally checked in their abundance by the muddy waters in which they had to live.

From that time the fish have been decreasing until there are only a few left in the Mitta, the Morass and the upper waters of the Victoria, Cobungra and Wentworth rivers. Some thirteen years ago Mr. Easton tried to restock the streams by getting some salmon ova, but there was difficulty in getting them up with sufficient care and placing them in the streams. But still, some of them survived as one was caught at the outlet of the race from the Omeo Park to the creek and some tourists caught a couple of dozen at the Cobungra bridge about two years ago. However, the attempt now made by the Omeo Fish Acclimatisation society is likely to meet with more success, and after two or three years are over there may be a chance of seeing a nice dish of locally bred trout on the breakfast table.

Omeo Standard, 21 November 1905
They are in a hurry to commence fishing for cod in the Morass, not waiting for the season to open on the 1st of next month. If the local constable kept his eyes open he would get a good haul – not of fish but of men.

Argus, 16 February 1912
Mortality Amongst Fish. Mr. P. Newman, honorary inspector of fisheries and game, writes from Bonegilla: — "I am curious as to the probable cause of a heavy mortality amongst fish here. Myriads are succumbing in many of the lagoons, the waters in which have, I presume, been fouled from overheating and evaporation, due to exposure to excessive sun's rays. Mortality is not confined to shallow waters, as in crystal clear lagoons from 6ft. to 8ft. in depth, and half an acre in extent, with apparently plenty of food, dead fish in large numbers are floating. The majority are silver bream, from 1½lb. to 2lb. in weight, although perch and cod of much larger size have also been observed. A notable feature is that catfish, in which the lagoons abound, appear to be weathering the conditions. Today I saw a cod 3ft. 6in. in length by 31in. in girth, and weighing 40lb., that had perished under similar conditions".

Argus, 23 January 1917
English Perch. A very excellent colour sketch of a fish caught in the Mitta Mitta River is sent by Mitchell Canning, of Tallandoon North S.S. It marks the stranger without any doubt as an English perch, a very undesireable fish, in my opinion, and likely in the long run to prove a pest in any stream to which it may unfortunately have found its way.

Argus, 26 December 1917
Cod And Catfish. "A big lagoon in the Mitta Mitta Valley, a few miles above Tallangatta, abounds in catfish and cod, but, according to the local evidence, they have no liking for each other's society. It is stated that you will always find codfish at one end and catfish at the other, and that never, or hardly ever, is a fish of one species caught in the 'territory' of the other." ("T.D.," Elwood).

Argus, 3 January 1922
Roach. Although my belief is that some fish sent to me by a Tallangatta boy are English roach, I am by no means sure about it, because many of the English pond fish are much alike, and one must go to fine points in comparison before being at all sure as to the species. With the help of some scales sent by an adult angler from the same stream, I may be able to offer later a more positive opinion about them. In the case of roach colour is not a reliable guide, although the contrast of red fins with shiny silvery scales, larger than those of a carp or tench, make them, when freshly caught, a very handsome fish. The fact that some of the fish caught at Tallangatta were alive 2½ hours after they had been taken out of the water makes it certain that they are not native fishes, and rather suggests the carp family.

Argus, 4 July 1924
Large Golden Perch. While Mr. W. M. Paterson and Mr. A. Trasker (Tallangatta) were fishing a lagoon at Tatonga recently, and using an aeroplane spinner, they landed a golden perch weighing 9¼lb., and they wish to know whether in the experience of other anglers the size is unusual. They hear of them up to 5lb. in weight, but seldom larger. On the lagoon, and spinning from a boat, they still get a few cod, though so many people think it too late in the season for them.

9.6 Mitta Mitta River Catchment Oral Histories

The following oral histories (OH 77-93) mostly discuss the Mitta Mitta Catchment.

OH 77

Jack Rhodes has kindly provided permission for these paragraphs from his book (Rhodes, 1999) to be re-published. The oral history was provided by 'Swampy' Jack Pendergast of Wodonga, formerly of Benambra.

"Grandpa" Pendergast was over ninety years of age when I called to talk to him in Wodonga. I was greatly encouraged to be told that I would find him down in the shed making something, as I have always been able to talk to people who make things. This man was no exception. I had expected that we would talk, if he was a fisherman, about the west side of the mountains and reinforce what others had said. How wrong I was, Grandpa Pendergast had fished out of Omeo in the Big River or headwaters of the Mitta Mitta River, to the eastern side of the mountains. The expeditions in his youth had been by horse-drawn vehicle in an area where even summer temperatures at night can produce 'brass monkey' conditions. He said they would get to the river on the first day and sometimes catch enough bluenose and white eye on the first night to be on the way home in the pre-dawn chill of the next day. He said, as any old white eye or cod fisherman might say, "You know they bite best at night".

Although I had never caught many bluenose, I had as a youngster, fished for white eye with my brothers by the light of a hurricane lantern in the Yarra River at Heidelberg. When I left Grandpa Pendergast, we had re-lived some of his youth and, figuratively speaking, he had a fair heap of scales to clear up before he got on with his job.

Footnote: 'Grandpa' Pendergast has been identified as 'Swampy' Jack Pendergast by relatives including Graeme and Reg Pendergast and historian Max Dyer. He is believed to have been born in 1879, arriving in Benambra in the 1890s and married around 1906. He spent the latter years of his life in Wodonga with his son Reg Pendergast Snr. He eventually moved from Wodonga to Bairnsdale where he died.

OH 78

Margaret Pendergast of Benambra was interviewed in December 2006.

My mother, Doris Gould, was born and grew up at Gibbo Park. Mum was born in 1920 and talked about the stories of her childhood in the 1930s while my grandmother, born in the 1880s could go back a lot further. Mum said the boys would go out fishing and usually catch trout or cod. The cod were not the normal Murray River cod; they were called a Trout cod. Granny said the only real cod was the Murray cod, they were much nicer to eat, she always referred to the local cod as a Trout cod. Mum always said the same thing; the better eating cod were the Murray cod. Granny said the Murray cod was a big, pot-bellied fish that just laid under a log and ate the tucker as it went past, while the Trout cod, in the swifter rivers, he had to chase his food. She said "the Murray cod is much better to eat than these local things, these Trout cod, which are just too dry". Whenever we went to Albury we had to have a feed of Murray cod, my mother and grandmother loved the fat in it. I only had it once, I couldn't stand the fat!

I was told how the boys used to go out fishing and the Trout cod they would sometimes get 3 or 4, up to 20 pound. My uncle, Gordon Toland caught the Trout cod in the photo near Gibbo Park, down in the Mitta, I think about 1935. They were nearly all Trout cod, though apparently a small Murray cod was caught occasionally I was told. That was in the Gibbo Park area in the twenties and earlier. They were more common in the Mitta than the Gibbo. I was shown, just above the junction in the Gibbo a ledge or fall, a large drop, which the cod and bream could only get past in a flood, it was after a flood that the cod were apparently caught in any numbers above this fall. In later years Granny talked about how the boys would ride for miles to try to catch a

cod, off to Italian Point or Port Cirelle, by then the cod weren't caught much above the junction, that is the Mitta and the Gibbo. That would have been by the late 30s or early 40s.

OH 79

Bill Hollands of Omeo was interviewed in July 2006 at an age of 90 years.

I can recall as a 3-4 year old on Boxing Day my family catching cod and black bream in the Morass Creek. The cod went a long way up the Morass, well up to McKinnon's, in the big holes, up past "The Brothers", 6 to 7 miles north of Benambra. The cod were still being caught in the Morass at Uplands in the 1920s. I used to fish the holes in the Gibbo for the Macquarie perch in summer and autumn; if you caught one you'd throw in again and always get more. I once saw 'Swampy Jack' Pendergast in a buggy, catching greasies for bait, and then coming back in the buggy and having a big cod in the back. He'd been down to the Mitta, near where the Gibbo comes in, where the Wombat comes up. He used a light to attract the cod. I used to catch big Blackfish up near the head of the Tambo River, sit up all night catching Blackfish. They were commonly 13 or 14 inches long, sometimes bigger. My father was involved in the first releases of trout in the Benambra area.

OH 80

Vince Pendergast of Benambra provided these comments in April 2006.

There was a series of deep holes in the Morass Creek in which cod were caught before World War 1. After that they silted up from the cattle. Cod were caught in the Toke-Gibbo area of the Mitta Mitta by cattlemen on their drives from the 1920s to the early 1960s.

OH 81

Graeme Pendergast of Benambra provided these comments in April 2006.

The 'cod hole' was about 6 km out from Benambra on the Tableland Crossing Road, just below the bridge over the Morass. Years ago a dead roo was hung on a wire over the hole so that the maggots would attract the cod. A 20 lb. cod ended up being caught on maggots.

OH 82

Hughes 'Sonny' Betts, formerly of Benambra, was interviewed in July 2006 at 90 years of age.

There was lots of cod in the Gibbo in the late 20s to 30s. Lots of small ones, around 2 to 3 pound was common. The 1939 bushfires went all through Omeo and Benambra. By then they had got scarce, but that seemed to finish them off. The bream, what they called the Macquarie perch, well there was heaps of them in the Morass. Any of the deep holes had them. The biggest were up to 3 to 4 pound though I did see a 5 pounder. They pretty well had disappeared around the war, by 1945. I used go up the Morass at Beloka, it was in a valley but all scrubby. You couldn't fly fish it. I used to cast a bait up into the holes, that would be where the trout were waiting. Or a silver or gold spoon, something like that. Used to catch lots of trout up to 12 lb. That was a brown. The best rainbow was 7 ½ pound, caught that in the Morass up at Beloka too.

Charlie Boucher hung a dead sheep on a wire over a deep hole in the Morass Creek below his house. All the maggots fell into the stream. Well he eventually got a 20 lb. cod on maggots. That was the biggest cod caught in the district. Everybody was talking about it. I can remember "Swampy Jack" Pendergast used to go out the back of Omeo, right up, and catch the cod and bream. He moved back to Benambra, caught cod down below in the Mitta. At the time there were a lot of greasies around. They did get used for bait.

OH 83

Max Dyer, formerly of Uplands, was interviewed in December 2006 at an age of 78 years.

I grew up on the Morass Creek at Uplands. The only cod I ever saw was one that I saw feeding in "a big fish hole" above Taylor's Crossing. It gave me quite a shock. I didn't know what it was. This thing was swimming

around, a cod of ten to twelve pounds, a dark greeny colour with a head a lot darker. Although I didn't catch any cod, I was told many stories about them by my family and friends when I was young. I was told when my brother Steve was about six years old; he caught a big cod in the Mitta. My dad used to laugh about how my brother used to thread the worms; he was so young he didn't know any better. Well the one he caught was too long to go in a sugar bag. That was out in front of Fisher's Hut, two miles below Taylor's Crossing about 1927. There were cod caught out of the Morass at Poulson's old place. There was an eighteen pounder caught out of it by Dave King on Good Friday about 1908-9. The fish was caught by Dave just below the old "Wombat Crossing"; it was a crossing on the Morass Creek that the miners used when they were going to "The Wombat".

Gordon Toland's father, Johnnie Toland spoke of catching cod near Springvale Homestead. Springvale was one of the first homesteads built on the Morass Creek; it was about three miles upstream from Murphy's Waterhole. He used to catch cod near where the bridge was eventually built. There is a hole on the Mitta Mitta River known as "the big fish hole". Will "Weary" Pendergast went down there with a horse and gig down to the Mitta and called in on the way back to show dad what he had caught. He had a cod that wouldn't fit in a flour bag. Actually he had trouble fitting it on the floor of the gig. Dad said it was over three feet long. Its tail was bent up a bit on the floor of the gig. He had the head preserved at "Leinster". That was about 1928-29. That spot became known as "The Big Fish Hole", below Taylor's Crossing, half a mile upstream from Chinaman's Spur. Below Ben Buckley's place. It's roughly two thirds of the way between Hinnomunjie and the Gibbo River junction.

My dad used to go down to the mouth of Toke's Creek. Tom Toke had the first store on the river there, opposite Italian Point. He was killing Chinamen and selling it to the miners as "Pork". But they never got him for it. Later on old Cirelle moved into the store. It was later known as Port Cirelle. About a mile and a half above Tokes Creek Junction. Tom and Violet Stevens used to go to school with me and they told me how they used to catch cod there. They used to reckon that it was the highest point on the Mitta where you could reliably get the cod. That was about 1935-36. Just above "The Wombat" is a long hole with a limestone bluff. They were still catching cod there at the time too.

I was told about the day when dad went down to the mouth of Tokes Creek and didn't catch any cod. An aboriginal woman lived there and she told him he would do no good; that the best time was in a few weeks and she told him the date the moon would be right. Well he went back and fished when Black Annie told him to and he filled his sugar bag with cod. Black Annie lived with Jack Forest and was well respected by everyone. She acted as a midwife for many of the local women, kept his house as clean as a whistle. One day she got wet after falling in the river. This brought on a chill that turned to pneumonia and she passed away in the Tallangatta Hospital.

An old Omeo Standard of 1904 tells us that a lot of fish were dying at the mouth of "Ferris Creek" and that Mr. Tom Ferris had captured a 12 pound cod from the sick ones.[1] *My three sisters aged 14, 12 and 8 went fishing for perch just above the Morass Bridge on the Corryong Road. They caught enough to fill a baby's bath. The last perch I saw come out of that creek was caught by Fred Sergeant in the corner hole below that bridge. That was in 1937. There is a "Cod Hole" on the Morass Creek and it is in Alan Rundell's paddock a good half mile below the Tablelands Bridge. This cod hole was where old Uncle Ned Clarke always opened the Duck season. What a wonderful old fellow he was! He never shot any more than four ducks, and was well satisfied with those. What a pity there weren't more like him.*

Alex Fraser lived beside the Mitta River at what was known as the "The Dog Fence" on a property owned by the late Pat Kelly. He was a complete alcoholic, but kept himself and his hut spotlessly clean. He had the best stack of wine bottles that anyone in the district had ever seen. One morning in 1949 we met him walking up the road

toward the Kelly home. We were on horseback and on our way to Quart pot to muster cattle. Alex was carrying a rolled up sugar bag under his arm, and in that bag was a huge fish. He was using a long thin stick for a walking stick. This was in his right hand and the bag containing the fish was under his left arm.

We stopped and talked to him for a few minutes and Alex in his old peculiar lisping voice said, "I've got a blooming nice fish here that I'm taking up to Mrs Kelly. You know she's an invaleed (invalid)." We rode off and dad said "That was a codfish that old fellow had in the bag. Didn't you see the rounded tail that was sticking out of the bag?" It appears that Alex used to have set lines in the big hole in the Mitta behind his hut. This is about a mile and a half below Hinnomunjie Station or two miles below Hinnomunjie Bridge. The last place the locals talked about being sure fire for cod was at Port Cirelle, they were caught there into the 1940s. Odd fish turned up after that. I can vaguely remember that there was a cod caught I think by Bob O'Dea from Swifts Creek up in the Beloka in the early 50s, it was considered very unusual at the time.

1. Ferris Creek was on the Morass Creek at Tom Ferris' property, later known as Poulson's. Poulson's Hole was located about 400 meters above the Morass Creek Bridge on the Benambra-Corryong Road. Many thanks to Mr. Brett Lee of Gibbo River for identifying this location.

OH 84

Stan Walsh of Tallangatta, formerly of Mitta Mitta, was interviewed in September 2006 at 84 years of age.

In the early days the Murphys[1] used to fish with poles. They had a thick line. They used for bait worms, bardie grubs and yabbies. The marrow out of the middle of a bullock's back was a good bait. Parrots and small birds were used for the cod. Greasies were used too, in my time; a good bait for cod. The biggest greasy I've seen is about 9 inches. They are nowhere near as common as they used to be. Oh I know about the bluenose alright! It was James Murphy that showed me my first bluenose. A lot of the locals called them a rock cod. The bluenose had a different shape. It had high shoulders, was pointed in the head. The colour was different too. Often it was a lot darker on the head, a black or blue. The bluenose were a lot drier to eat too. James said in the early days there was plenty of bluenose, they were very common. More common than the normal cod in the Mitta. The cod was always considered special by the settlers. They only took what they needed. They were so common that James said they could catch one anytime. James said the bluenose used to spawn earlier than the normal cod.

By my time the bluenose were less common, though I did catch quite a few when I was very young, up till I was 14 to 15, then they became scarce. Mr. Murphy told me that the Murray cod had taken over from the bluenose. As the bluenose got caught the Murray cod being bigger was the boss. He moved in, took over. James said that the Murray cod ate the spawn of the bluenose as he was bigger. I agree, I think the Murray cod took over. The Murphy's were religious people. I saw James Murphy catch a 70 pound cod and release it. He let the bigger breeders go to keep the river stocked. Kept the smaller ones of 12 to 15 pound. Just what he needed.

I used to catch plenty of cod in the Mitta Mitta, mainly Murray cod, though I did catch bluenose as well particularly around Banimboola. Just before the dam was built maybe 1 in 50 or 60 of the cod was a bluenose, you knew straight away as they were very good to catch. They were a much faster fish in the water than the Murray cod. You mainly caught the bluenose in the ripples just like you catch rainbow trout in the ripples. The moving water at the top of the hole or near the rocks. Cod were caught up to about 80 pound further down the Mitta; the biggest bluenose which I caught weighed about 20 pound. At Springpole there were lots of big rocks and I would dive under the rocks and see up to nine cod at a time. Sometimes they were in pretty shallow water. I saw cod caught up as far as the Wombat but after the war they were mainly caught up as far as the Dart River.

There were some silver bream (grunter) in the early days, I saw a few when I was very young, and plenty of the Macquarie perch bream. I know the silver bream. I once fished at the Junction of the Lachlan and the 'Bidgee. Caught 15 in a half hour around dark on worms, all about 2 pound. Could have caught a lot more. Never heard of a yellowbelly in the Mitta Mitta in the early days. Hear of a few now in the river coming out of the lake (Hume) as they are stocked. There were some Catfish in the lagoons. The lagoons that stayed connected to the river from Mitta Mitta downstream were full of cod and greasies. Also had lots of trout too, in the lagoons.

Up to the 40s there were plenty of Macquarie perch in the area. I once saw a shoal of bream that might have been 2-3000 moving up the Larsen Creek on their spawning run that turned the water black, with their backs nearly out of the water. On one occasion about this time I saw a bream taken by the local doctor on a fly at the Dart river junction. I had never thought about using flies for them. Mostly the bream were around the 2-3 pound mark.

The Soldiers and Tokes Creeks had the native Loch Levin trout. They are a solid little fish up to about 10 inches. Real deep, with the most beautiful round red spots. Never saw Macquaries in those two creeks, they were just too small for them.

1. James Murphy, an original settler, and his son, Jack, provided Stan with instructions on angling from an early age. Stan knew James Murphy whilst a child, James passing away in 1954 at an age of 89 years. His son Jack died from cancer in 1945 and Stan spent a great deal of time with him in his last months. James and Jack Murphy passed on to Stan stories of how things were in the past.

OH 85

George Murtagh of Mudgeegonga, formerly of old Dartmouth, was interviewed in October 2006 at an age of 90 years.

The big water race from the mines was in front of our place, at Dartmouth. We kept the fish alive in the old water race, until we needed them. We lived off the fish and the rabbits. The river was full of cod and bream. You could catch them all year round, though they bit in some months better than in others. We used to catch a lot of cod between Murphy's place and where the dam is now. Anything was used as bait for cod back then. Livers and kidneys out of rabbits. I've seen them shoot sparrows for bait for the cod. I used worms, just roll the logs over and get the bush worms, no digging. If the cod and bream were biting, you could catch all you wanted. You would get sick of eating them. There was one old fellow working with my father. Well we were all sick of the fish; he was the only one that would fish for them. Eventually he got sick of them too, he threw all his rods in! I reckon I've got here by eating all that fish!

Back in the twenties, when I was young, we used to get both types of cod. The second type was darker and longer, usually thinner without the gut of the normal cod. It had a pointed head, often black on the head. Didn't have the patches on it like the normal cod. It was marked finer, like a trout. We called them "rock cod" though some called them "Trout cod". My father called them a rock cod. Haven't heard them called a "bluenose", that would have been before my time. They were pretty common, when I was young more common than the normal cod. They were often in the same places, the two types together. In other places the rock cod was more common, particularly around the rocks. They always seemed to be feeding in those places around the rocks. The biggest was about 12 pound, most were about 8 to 9 pound. Most of the cod I caught, both types, were about that size at Dartmouth. The biggest Murray cod I caught was 15 pound. The rock cod, they were the first fish that started to disappear. Later on you would put lines in and get one of each type, early on you would get more rock cod. The rock cod seemed to disappear during the 1930s, certainly by the 1940s. After that they were less seldom caught, mainly the normal cod. One now and then.

There were big cod caught in some of the deep holes around Mitta North. The best was close to 100 lb. I caught good cod at Tallandoon, put crosslines in and got 10 pounders. I saw one out of the Hume Weir that was over 100 lb. In the early days I heard of a few grunter caught in the river. I heard of the Catfish in the Mitta Mitta area too, in the lagoons and the river. All the little creeks were full of the greasies. The creek here (at Mudgeegonga) too had them, though I think all of the spraying for the blackberries may have got rid of them. About twenty years ago I saw two 6 pound trout come out of the creek here.

I've certainly caught cod and bream in the Mitta up as far as Eustace Creek. Used to run cattle up through the hills. The bream I caught up to Tokes Creek. I used to fish a lot at the Dart River junction and in a hole about a mile downstream where there was a whirlpool. Caught a lot of cod at both places. The Macquarie perch would come on the bite for a while about ten in the morning, and again about four in the afternoon. You got sick of catching them. I've caught the bream 8 miles up the Dart River; they were up to 2 pound in weight. In the Dart River I was shown how to tickle trout, my brother was the tickler, though I didn't have the touch. I saw one trout tickled that was 3½ pound. The biggest bream I saw was about 5 pound, down below where the pondage is. I always caught them on the bush worms, though I know others have caught them on the spinners.

The first trout was caught at Dartmouth when I was about 6 years old. The locals didn't think much of them, they thought they were killers; they didn't have a high opinion of them. I saw trout used as bait for the cod. Later, when the cod and bream got scarce people started fishing for them. I remember in the late 1920s, certainly by the early 1930s big shoals of hundreds of redfin coming up the river, all 6 inches long. The locals went mad about the redfin as they thought they were eating all the other fish out. The 1939 bushfires killed a lot of fish. A big storm washed down all the charcoal, washed down all the fish. You could see all the dead cod and bream on the bottom, and washed up on the ripples. Then afterwards there was a drought, the water became so shallow, it killed cod, bream and trout. After that they never really came back in the numbers.

In the 1950s I moved over to here, to Mudgeegonga. Do you know Boyd's Bridge, on the Kiewa? Used to fish it a lot for about a mile downstream. I caught a lot of cod, the normal cod. You were very unlucky if you didn't get at least one. They were mainly 6 to 7 lb. My son got one here that was 47 pounds. I saw one cod caught that was hanging over a man's shoulder touching the ground. For its length it was pretty poor. It only weighed 70 pound. I never saw a bream caught out of the Kiewa. In the Kiewa the cod were inside the hollow logs. Some of the locals used to go belt the logs with a hammer to wake up the cod. They reckoned that sometimes they would sleep for days. Then the river was snagged which wrecked things for the cod, plus the big dams for the irrigation. In the Mitta too, the cold water for irrigation. When they were snagging the Kiewa, they pulled out the logs. A couple of times they could hear a flapping inside the logs. There were cod in them.

I fished above Myrtleford in the Buffalo. Went right into the hills, very steep and hard to get into. My knees are no good now. Went into this rough country at Abbeyards. I caught the bream, lots of them, only small, up to about a pound and a half. I didn't catch any cod though others spoke of them up there. That would have been over 25-30 years ago, maybe longer.

The way things were in the past are gone. Those times won't be back. But people should know how it once was.

OH 86

Tom Yea of Wodonga, formerly of Mitta Mitta, was interviewed in June 2006 at an age of 79 years.

As a 5 year old we used to fish around Springpole, between Dartmouth and Mitta Mitta. Used to catch stacks of cod and white eye. When I was young we caught Macquarie perch in the west branch of the Snowy Creek. In the perch hole at Springpole there was a rock bar in the river which the perch could not get over till it flooded. You could see hundreds of white eye; this small fall blocked their way. The Macquarie perch were common at

the Possums Point beach until about 1950, then they disappeared. About that time swarms of millions of redfin were seen in the river, about the time the Macquaries disappeared. The trout may have affected them as they moved down the river too.

We used to catch the cod up to about where the wall of the dam is now, maybe a bit further. Between Possums Point and Coleman's we used to catch cod from about 12 to 18 pound on spinners. Coleman's gardens were about where the Dartmouth pondage is now. We used to catch the cod at Springpole in a backwater on rabbit head. 18, 14, 12 pound were common. In the faster water we caught the Trout cod. I've caught them in recent years below Yarrawonga. They are also now doing real well above Hume. Back then when I was young in the faster water in the Mitta maybe half the cod we caught were Trout cod. Magoora Gap was a great spot for cod. Some of the locals used to roll rocks into the river to wake up the cod before fishing. Back then I used to use a carbide light at night to attract the trout. The trout would come to the light.

OH 87
John Yea of Mitta Mitta provided these comments in June 2006 at 70 years of age.
There was heaps of cod between Mitta and Dartmouth, up to the 6 mile Creek near the Dart River Junction. There was heaps of them 50 to 60 years ago, even up to 40 years ago. They were common from 10 to 30 pounds. The greasies in the Mitta were great bait for cod. You could catch 3 to 4 cod a night up to 30, even 40 pounds. The aeroplane spinners were tops too. By then the Macquarie perch were scarce.

OH 88
Collin Scales of Dartmouth was interviewed in July 2006 at 80 years of age.
Billy Yea shown me the other type of cod. It was longer and sleeker fish, bluer in colour and spotty. They were caught up to about 12 pound. Maybe 10% or more of the cod caught were these "Trout cod". Forty years ago we'd used to catch cod up above the junction of the Dart, right through down past Possums Flat. That was its correct name. The biggest cod I caught was 35 pound on a red carp, though they were caught up to 80 pound down Eskdale way. When we were kids we used to get lots of cod about 4 pounds as well as the bream. We also caught a few grunter when I was a kid. I caught the Macquarie perch in the Snowy Creek and the Dart River years ago. The Macquarie perch were up to about 3 pound in the river in the 1950s.

OH 89
Les 'Brickie' Franks of Tallangatta was interviewed in December 2006 at an age of 67 years.
My father was Jack Franks and we used to fish the river a lot, around Eskdale. My old man used to say there used to be plenty of Catfish, around Mitta, Eskdale, in the river. They used to get them above Old Tallangatta. Then he said they just disappeared, I never saw one. The rock cod, they were common around Banimboola, with odd ones further downstream, when I was fishing. The old timers reckon they could get the bream any time. There was one hole this side of Banimboola and they used to call it the 'bream hole'.

The old man said when he was young they'd tie lines to 4 gallon drums and find them way down the river. Another trick was they used to put an old rabbit in a tin full of holes and the maggots used to fall in the river and attract the cod. Years ago every cocky had wire drum nets in the river; they pulled them out with the tractor to check them. And a fair bit of cross lining went on too. One day I was in the boat with the old man and he had his lines rolled up under his shirt. We saw this boat coming up the river and it was Jack Rhodes, the fishing inspector. He talked to us, but if he had asked the old man to stand up they would have fell out of his shirt and he would have got us!

February and March was the best time for the cod in the Mitta with the old aeroplane spinner, that's all they used. We would put parrot feathers on the hooks on the spinner. The feathers was to cover up the hook, they

were tied on with cotton. We used to catch them up to 20 to 30 pound on the spinners. Andy Boran, out at Yabba found one dead that was 90 pound. The biggest the old man caught was 64 pound out of the river, on the aeroplane spinner. And heaps of trout, there was a lot of trout around then. The sand was white like snow and the rocks and stones were nicely coloured in the river.

Number 2 was the size of the aeroplane spinner. If the water was a bit dirty we would use the copper one. All this spinning was done by hand and even though my dad had bad arthritis he did all the rowing. If a lightning storm came up we would pack up and head for the other car. It used to take us about four and a half hours to spin from car to car. If we lost one on the spinner we would give him a week and go back and set a line and catch him. Most of our fishing was done around Noorongong and Tallandoon. Them days there was plenty of snakes, you could not put your hand on a log to push the boat off, there'd be a tiger snake on it! When setting lines bardie grubs was the best bait.

Later on the river trust pulled the logs out of the river, the old man went mad about it. But once the green slime got into the river from Dartmouth, well the old man said it was buggered, the sand used to be white. I could write a book about the things we did and saw in the river. It was a beaut river years ago and brings back many memories.

OH 90

David Evans of Yea, formerly of Mitta Mitta, was interviewed in October 2006.

In the Little Snowy Creek I used to get lots of trout. I can just remember the Catfish in the lagoons around Eskdale. They went a long time ago. There were certainly cod caught in the Mitta, Paddy Walsh used to catch them. In the Mitta was the odd bream, off the sandbanks. I heard of the bluenose being mentioned at the time. Apparently they had been common, but by that time they were an unusual catch around Eskdale. I can remember as a kid my dad catching what he called a 'Trout cod' in the Murray at Gunbower on a mussel. Back then, in that spot, we used to get ten to a dozen cod a day, 6 to 7 pound in the Murray. I can remember it was long, he pointed out the bluenose, and different markings to a cod. It was an unusual catch for that area, but my dad knew what it was.

I arrived in Yea in 1950. Jacky Tosh had the Shell service station in Yea. He used to talk about the Catfish, how in the past around Yea you could hear them chomping at night in the lagoons. They used to talk about that at Eskdale too. I never saw one at Yea. At that time in the Yea you got the odd little bream and the slimies. About 1950 it was known that there was a good cod hole in the Goulburn at Woodlands, down near where the King Parrot comes in.

OH 91

Reg Pendergast of Wodonga was interviewed in September 2006.

My old man was Reg Pendergast, he was born up at Benambra in 1906, died in 1983, and my grandfather was 'Swampy' Jack Pendergast, he come from Benambra. There's been a few fishermen in my family, my uncle 'Cor' (Cornelius) Pendergast he was fishing crazy, he knew all about the fishing up the top of the Mitta Mitta. And George Murtagh, he's an uncle. Johnny Yea's old man used to catch cod between Eskdale and Mitta, at Easter, every Good Friday morning; he would go down and catch a cod, 20 to 30 pound, up to the late 1950s. Then they got scarce. The Mitta (Snowy) Creek back then was absolutely full of the greasies, they were only about 6 to 7 inches long, I was only about 10 at the time, I'm 67 now. You could catch them like buggery, then they just disappeared. Old 'Lightwood' Bill Pendergast, he was out at Khancoban, he used to come home with these eels, out of the creek at Khancoban. When I was a kid he had them for tea, he'd come home with these eels, as well as the trout and the rainbows. Then they disappeared too.

I can remember the bream that we caught at Banimboola, there was 'the perch hole' at Springpole, my old man owned that, they were caught there up to maybe the early sixties, they were still there in the fifties. There was some caught further downstream but they had got pretty rare upstream. My old man talked about years ago catching them right up through 'the Wombat', and the cod they were right up through there. They were caught up to 40 pound up that way. There was supposed to have been cod and bream in all the rivers up that way, up past 'the Wombat' and through Benambra way.

I worked for the Forestry Commission, we used to go up and look after the houses up through the 'Blue Duck', up to Glen Wills, we used to go up there and paint them. At the pubs there was always fish being brought in, fish heads there, mainly the rainbows and the browns. But there was a few cod caught up there, that was the last of them that were caught, up in the 'Blue Duck' in the 1950s. There was supposed to have been a fair few of them up there a long time ago, but odd ones were still being caught. The ones I saw were about 5 to 6 pound, no bigger, definitely cod, I saw them. They caught the cod just up the other side of Glen Wills in the Big River, odd ones, and I saw some that were caught just below the bridge at Glen Valley, in the 1950s, that was the finish of them up there. I never saw or heard of anyone talking about catching a perch up there, there was only the rainbows and browns and these few cod.

OH 92

Alec Turnball of Tallangatta was interviewed in January 2008 at 84 years of age.

Fishing, I used to do a lot of it! I'll be 84 in a couple of weeks, grew up at Fairyknowe, on the property. I had 2500 acres of freehold and 11000 of lease. In the Mitta there was plenty of cod, plenty of bream the Macquarie perch, the best time to fish for the cod was when the moon comes up, I've got them up to 76 pound and I've had some on that would be close to a hundred or over. I used to fish, round here from down below Yabba more or less to Tallandoon, even Mitta North. The Catfish used to be in the lagoons round Bullhead along the Yabba Road near Fairyknowe. We used to get them up to three, three and a half pounds, I reckon they were still around in the 40s but they went quick. Early on we used to catch a lot of another type of bream the silver one, a good size one was a two to three pounder, or a bit more. I never caught or heard of a yellowbelly down here until recent times.

I used to ride up into the Dart to go fishing, the late 40s, early 50s, ride up to Tokes Creek, go into the saddle between Eustace Creek, even a bit below the Wombat. In the Dart River there was hundreds of the trout there, used to catch a few redfin in the Dart too, catch redfin from 2 to 4 pound, got the redfin about two mile up the river. The redfin went up as far as Eustace in the Mitta and I caught plenty of cod out of Eustace. In the Mitta I've caught the bream six miles up from the Dart River, I got a nice one that far up there were some good holes up there. I heard there used to be good fishing for the bream in the Little Snowy Creek that they were good to catch there and I did catch them there myself once about a mile and a half up. They used to catch quite a few in the river below where the creek ran into the Mitta Mitta River.

We used to ride up to Tokes Creek; we'd leave the truck at Banimboola and rode the horses from there. Old Stan Walsh he worked for me for many years, he'd go fishing too. The track in places was only two foot wide, we'd ride along with a foot out of the stirrup just in case, it was so steep. The Macquarie perch the average one would be a pound or better but we got them up to five pound, we'd get them just on worms, there was thousands of them. I rode a horse up into the Mitta once and there was hundreds of them on the gravel in the shallow water. I know old Tom Coleman rode up the Mitta once and he said to me 'Jesus I've never seen so many fish!' he reckoned he'd seen thousands all together. There was cod through there, we used to catch them but the bream were thick. The cod came in different shapes, there's the Trout cod, I've caught a few of them, used to see them there, round Banimboola.

The cod went right up to the top of the Mitta; there was plenty of them, yes they were still up in the Black Duck Hole. The Black Duck Hole was just a bit down from where the Cobungra flows in, there was cod caught there up to the 50s, even in the 60s odd ones. The biggest up that way I did know about was the 33 pounder, it was caught just below Faithfuls, just after the road swings sharply and you come into the open country, there's a big deep hole there, still is. It's a bit further down from the Black Duck Hole.

There was cod in the Tallangatta Creek; they went nearly to the top of the valley, above where you drive across the creek. They were caught up to 12 to 14 pound, that was way back in the thirties, but I don't know for sure about the bream being up there, they should have been, they were everywhere. There used to be a lot of Blackfish or greasies, there used to be big numbers of them at the top of the Tallangatta Valley Creek, and just after Christmas I was talking to a camper at Pigs Point just up the Omeo Highway from Tallangatta and he said there was a lot of them in the river there. In the small streams in the mountains were what I call the mountain-trout, they are only about three to four inches long. When the streams stop running or go underground they still seem to survive. At Lucyvale there was cod up there too. Just after you cross the Lucyvale Creek there was a reserve and down in the creek that was there they were catching them a long time ago, it wouldn't have been later than the start of the thirties.

In the river here the old cod he's still around. The cod they feed only once a fortnight, that's all they need, so you need to keep at it to catch them. Under weeping willows was the best place to catch codfish. Willows are a native of Indonesia and Australia. My grandfather Robert Turnball was a foundation member of the Victorian Parliament and the first member for Gippsland and then the North-east Providence which went from Corryong to Swan Hill. He helped draft the Victoria constitution. He said there were weeping willows hundreds of year's old back in the 1850s.

They talk about this drought - well the drought in '45 was a shocker, the worst drought I remember. The pine trees are very poisonous; all these plantations they haven't done any good for the rivers. And fires, I used to work for the department, be pushing roads in, and as we'd go out we would set it all alight, it always used to get burnt. And the wildlife you'd see all the wallabies, currawongs, rosellas, it had always been burnt. They locked it up, now when there's a fire there are flames three hundred feet high, two acres of flame would break off. Nothing survives that, even if you went under the water if you come up there's no oxygen to breathe.

It's a sad sight to see what the European carp are doing to our environment and our river system, the erosion of our river banks and the falling in of our red gums along the banks. This is also happening where they have got into the lagoons also. The department has released thousands of cod into the rivers along with yellowbelly so hopefully they might clean up a lot of the carp. There are big numbers in the Dartmouth Dam now and are moving up the big streams in the Omeo area.

OH 93

Jack Moyle of Spring Creek near Tallangatta was interviewed in February 2008 at 92 years of age.

I'm ninety two years old, I grew up at Spring Creek, a little tributary of the Mitta, and my grandfather too, we've been here since 1880, he selected it. I remember going fishing with my father with a horse and gig and all we caught were bream, that was about 1922. The bream in the early days they were very easy to catch, there was no trouble catching a few bream, two to three pound was the sort of thing we used to catch. We used to get the limb of a particular tree, tie a piece of chord and go fishing for them.

About the cod in the Mitta there's been a lot caught. I've got a photo of me with one caught by my brother Eric in 1981 and it weighed seventy three pound. I haven't heard of one bigger from here. Early on there were some yellowbelly, they were not very common, they were in the Murray more so, not many caught in the Mitta, very

few. I know of one that was three pound caught down here when I was a boy. The grunter they were here too, but there was more of them in the Murray. They used to catch some Catfish in the lagoons all along the Mitta, going back a long way into the 1920s, but for most of my time I can't remember catching many. The only place they got them was in the lagoons, not in the river as far as I know.

We never went trout fishing in any of the trout streams until after the war, they hadn't come into the streams like the Tallangatta Creek much before then. Up in the Dartmouth Creek, they were catching trout in the Dart Creek by the end of the 1920s, me father knew people that lived there and they brought one down, that's when they started catching them up there. And the redfin they came in before the war, and we never went fishing for them here until after the war.

10 Upper Murray River Catchment

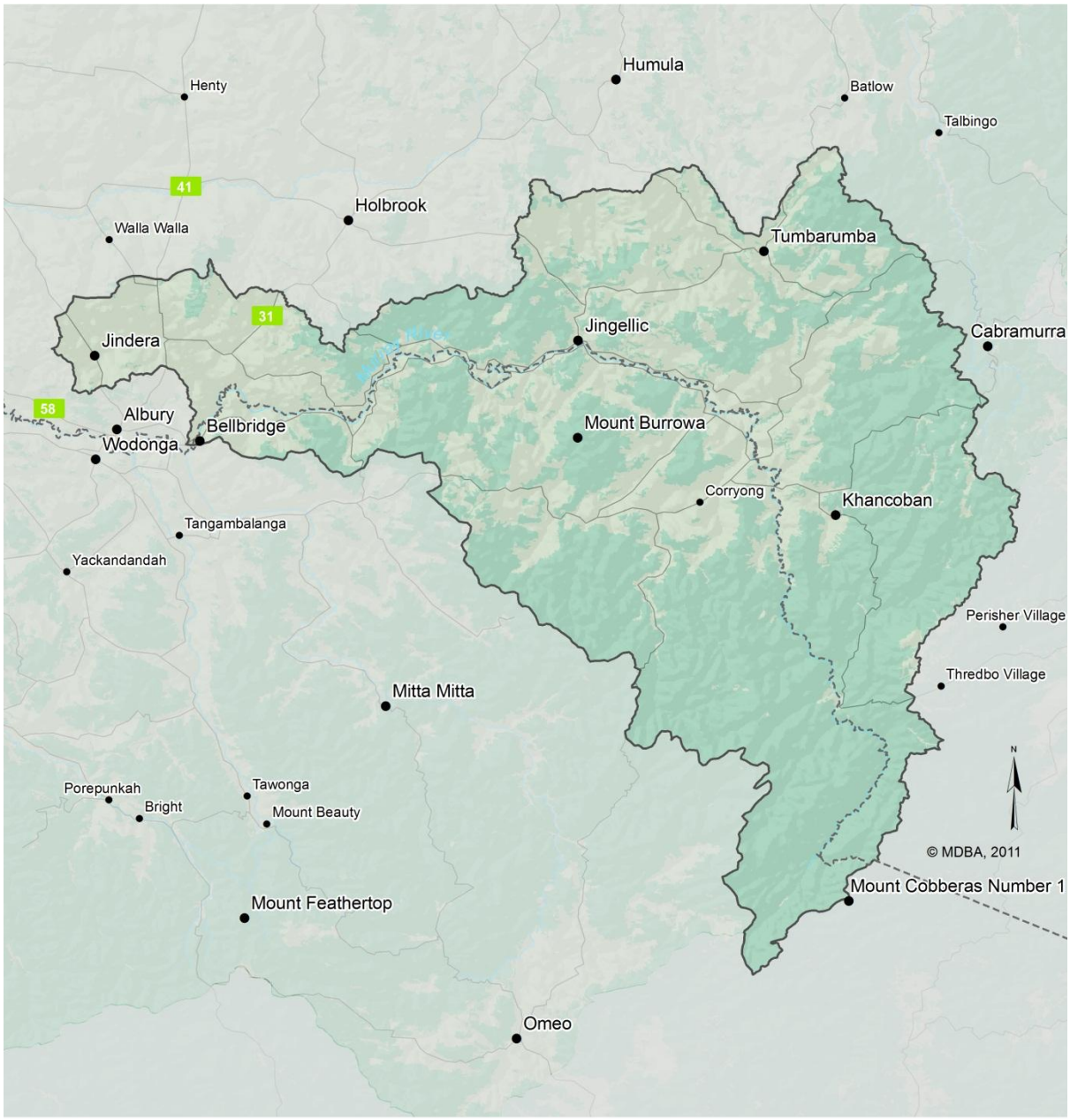
An hour's ferreting through the almost impenetrable scrub of this gully brought me at last to the valley, and I stood on the brink of the "young Murray." Those who have only seen this, Australia's finest river, in its ugliest portion—that is, where it flows through the level country from, say, Echuca to Swan-hill, or even further, to the junction of the Murrumbidgee—can have no idea of the beautiful, bright, mountain rivulet it is in this valley. I have travelled its whole length, even almost every mile, from its extreme source at Kosciusko's foot to its embouchure into Lake Alexandrina in South Australia, and a more interesting journey I cannot conceive any naturalist to take. In its mature age—that is, after the long Darling with its Queensland waters has joined—it is a magnificent navigable highway, some 300 to 400 yards wide, with rather a sluggish current of, since the advent of digging humanity, muddy water, and the bottom is of sand or mud; up at the spot where I now stood, it, in its babyhood, was only some thirty yards across, the current, owing to its great inclination, running swiftly; rushing, bubbling, tumbling along over a broken bottom of large waterworn boulders of granite, no mud or sand, and the water, crystal clear, foamed and sparkled as it was dashed about from rock to rock, with a merry noise as if apparently enjoying its liberty; so different to the level, muddy, treacherous-looking streams of interior Queensland. How often have I sighed for this bright pebbly brook when hunting for water in our dry North-western district! The clearness of the water enabled me to see distinctly the fine Murray perch and cod—the latter generally sheltered by some overhanging bank and in a back current of still water. (What a Paradise for your fish-loving "Redspinner!")

The Queenslander, 19 July 1879

An hour's ferreting through the almost impenetrable scrub of this gully brought me at last to the valley, and I stood on the brink of the "young Murray." Those who have only seen this, Australia's finest river, in its ugliest portion – that is, where it flows through the level country from, say, Echuca to Swan-hill, or even further, to the junction of the Murrumbidgee – can have no idea of the beautiful, bright, mountain rivulet it is in this valley. I have travelled its whole length, even almost every mile, from its extreme source at Kosciusko's foot to its embouchure into Lake Alexandrina in South Australia, and a more interesting journey I cannot conceive any naturalist to take. In its mature age – that is, after the long Darling with its Queensland waters has joined – it is a magnificent navigable highway, some 300 to 400 yards wide, with rather a sluggish current of, since the advent of digging humanity, muddy water, and the bottom is of sand or mud ; up at the spot where I now stood it, in its babyhood, was only some thirty yards across, the current, owing to its great inclination, running swiftly; rushing, bubbling, tumbling along over a broken bottom of large waterworn boulders of granite, no mud or sand, and the water, crystal clear, foamed and sparkled as it was dashed about from rock to rock, with a merry noise as if apparently enjoying its liberty ; so different to the level, muddy, treacherous-looking streams of interior Queensland. How often have I sighed for these bright pebbly brook when hunting for water in our dry North-western district! The clearness of the water enabled me to see distinctly the fine Murray perch and cod—the latter generally sheltered by some overhanging bank and in a back current of still water. (What a Paradise for your fish-loving "Redspinner!")

The Queenslander, 19 July 1879

Figure 10.1 The Upper Murray River Catchment showing major waterways and key localities



10.1 Early European Accounts

The earliest European encounter with the Upper Murray occurred during the expedition of Hamilton Hume and William Hovell. They passed through the Wodonga area twice, in 1824 and 1825, on their journey to the Port Phillip District. The large river they sighted on the 16th of November 1824 was named in honour of Hume (Bland, 1831), and known as such until after Charles Sturt's expedition. The aboriginal indigenous people of the Albury area referred to the Murray River as 'Indi' and 'Millewa' while Sturt, who first reached the Murray River by travelling down the Murrumbidgee in January 1830, named it to commemorate Sir George Murray, the Governor of the British Royal Military College. Over time the name 'Murray River' was favored and the 'Hume River' fell out of use (Andrews, 1920). For many years, from the junction of the Swampy Plains River upstream, the Murray was known as the Indi River and, while not officially referred to as such, the name is still used by some residents (Andrews, 1920). There is some dispute, however, as to where the Indi is demarcated from the Murray. Hovell made a number of references to the fish found in the region in his journal, generally describing them as being abundant, and later reporting that the fish they caught in the same area the following January 'were similar to those in the Macquarie and Lachlan, described by Mr Oxley, were not less than thirty or forty pounds weight' (Bland, 1831).

Hovell also provided details of the fishing practices of the local aboriginal people in the lagoons near the Murray River. It is apparent from his description that fish were an important component of their diet. They constructed wooden fish traps on the upper Cudgewa Creek near Kalangee and other local streams (Carmody, 1981). A large stone trap once existed on the upper Murray itself (*Sydney Morning Herald,* 8 November 1933), reputedly near Brigenbrong. Mathews (1909) recorded several names for native fish in the language of the Dhudhuroa who lived along the upper Murray River, the lower Kiewa and Mitta Mitta Rivers, including 'Wunnumberu' for 'black bream', 'Yumboa' for cod and 'Murroanba' for 'perch'. To date, apart from Hovell's account, very few early references to the fish found in the upper Murray area have been located, and those identified make general statements without describing the types of fish.

The path blazed by Hume and Hovell was followed by graziers seeking their wealth through the production of cattle, and later the 'golden fleece'. The first was William Wyse who established pastoral properties at Albury and Bonegilla in 1835. Progressively, other pastoralists established runs further up the river (Andrews, 1920). The well watered fertile plains developed into renowned properties including Brigenbrong - taken up by members of the family of explorer Major Thomas Mitchell.

The 1850s saw Victoria's population burgeon, with waves of immigrants seeking their wealth on the goldfields. Gold miner Henry Morgan spent most of his life working the Buckland Valley goldfield and later became a road builder for the local shire. In 1874, Morgan left his permanent residence at Upper Buckland to try his luck on the Mannus Creek near Tumbarumba. His diary records that on a number of occasions he fished the creek where there were 'falls up to 7' high' recording the results of his efforts including the capture of cod. On the 6th of October Morgan wrote 'Mr. J. Brown gave us a fish that he had caught at the falls, which weighed 5 lbs' and on the 11th again went fishing to record 'I was out all night by a fire – but caught no fish, but at noon caught two, one weighing near a pound and the other about 5 lbs' (Morgan, 1908). A significant commercial fishery operated, catching cod and other species at Albury and at least as far upstream as Talmalmo in the early twentieth century. At Albury, such large quantities of fish were captured, that to satisfy the requests of recreational anglers, local closures to commercial fishing occurred in 1907 and again in 1912 (NSW Fisheries Reports 1907; 1911; 1928).

Victorian Fisheries and Game Department Inspector J. O. (Jack) Rhodes commenced his career in September 1956. He was transferred to the Wodonga office in December 1959 and undertook enforcement activities in

the region until December 1977. Rhodes himself was a keen angler, and during his sojourn at Wodonga interviewed many senior residents about the history of the fishing in his district, recording them in exercise books. He learnt a lot of detail on the fishery of the Murray River near Wodonga in the early years of the twentieth century, particularly from Alf and Rusty McFarlane born c1890 at Wodonga. Despite providing copies of his notes to senior officers in Melbourne and Wodonga, tragically most have not survived, representing the loss of an invaluable resource on the early fishery of the upper Murray.

Rhodes retained a small portion of his notes, and they formed the basis of a chapter in his autobiography *Heads or Tails: Recollections of a Fisheries and Wildlife Inspector* published in 1999 (Rhodes, 1999). In that work he provided a comprehensive account of the fish fauna of the Wodonga area at the dawn of the twentieth century and the subsequent changes that took place, including dates for the arrival of a number of exotic species. Of great interest are accounts of populations of native fish, including Trout cod and Macquarie perch, in upland and montane habitats in north east Victoria; as well as descriptions of some of his encounters with the fish. Rhodes was very familiar with Trout cod, having personally angled them from Lake Sambell at Beechworth, and from the Murray River at Gooramadda, prior to joining the Fisheries & Game Department. When he interviewed anglers who referred to 'Trout cod' or 'bluenose', he obtained detailed descriptions of the fish concerned in order to confirm their identity (Jack Rhodes, pers. com.). The relevant accounts have been reproduced here and subsequently referred to as OH 53.

Colonel John Langtry, while conducting his survey of the inland fishery during 1949/50, did not carry out netting operations in the upper Murray. By that time commercial fishing was confined to the Murray River from the Corowa area downstream, and it was this area that was the upstream limit of his survey work. Langtry documented the treatment of the newly constructed Lake Hume between 1929 and 1934 with copper sulphate to control a blue-green algae outbreak. He described the subsequent fish kills, changes to fish populations and overall impact on the downstream environment. In addition, Langtry recorded some anecdotal information on native fish populations in the upper Murray c1950 (Cadwallader, 1977).

10.2 The Past Distribution of Fishes in the Upper Murray River Catchment

Due to the length of the Murray River, the *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the river into three distinctive reaches. The Upper Murray Region was nominated as the area existing upstream of the wall of Lake Hume encompassing the river and its tributaries excluding the Mitta Mitta River catchment. The *Sustainable Rivers Audit* divided the Upper Murray Catchment into a slopes zone (downstream from Bunroy), an upland zone (upstream to Tom Groggin) and a montane zone beyond the latter location. The Murray River is highly confined downstream of Bunroy to near Towong Upper where a narrow floodplain develops, so it is appropriate to classify it as upland downstream to that point. While for contemporary management purposes the wall of the Hume Dam represents a demarcation, from the historical perspective it is more appropriate to treat the upper Murray as terminating at the bottom of typical slopes habitat. Below the dam downstream to Wodonga West, the river is largely confined between low hills, with a relatively narrow floodplain containing extensive areas of gravel substrate. The slopes zone for this reason has been extended, and is treated below as terminating at Wodonga West.

Most of the historical research in this catchment concentrated on the Murray River itself and nearby tributaries between Corryong and Wodonga. Much of the information presented below on the slopes zone is sourced from information recorded by Rhodes (1999), an extensive oral history of senior residents, some with recollections back to the 1920s, and the oral tradition of their ancestors (mainly OH 53-60). This evidence has been combined with observations in the Annual Reports of NSW State Fisheries, some newspaper accounts

and a significant number of historical photographs which include good quality images of Trout cod, Murray cod, Macquarie perch and Silver perch. In the upland and montane zones the limited information available has mostly been sourced from the oral history.

10.2.1 The Montane Zone

Very few historical accounts exist of native fish in the montane zone of the upper Murray, and this may possibly be the result of the area being isolated and sparsely settled. Blackfish have been captured at elevations up to 850m upstream of Tom Groggin (Gilligan & Rayney, 2007) confirming their presence in the montane zone, and they were previously abundant in some creeks near Tom Groggin (Len Lebner, pers. com.). There is evidence that cod and Macquarie perch were common near the top of the upland zone in the Indi River near Murray Gates (Lebner, OH 60) suggesting they may have had a historical presence in the montane zone of the Indi River. European carp and Redfin perch have reached Tom Groggin (Gilligan & Rayney, 2007) demonstrating the potential of native fish to also access the area.

Rhodes (1999) recalled meeting an elderly angler at Tom Groggin Station in the 1960s who reminisced of catching 'bluenose' and 'white eye' in the Indi River prior to the First World War. The person concerned has been identified as Charlie Mildren who worked at Brigenbrong Station (Albert Mildren & Ken Nankervis, pers. com.). His recollections almost certainly describe the fishery in the Towong/Bunroy area adjacent to that station, not in the montane zone near Tom Groggin. No cod have been taken at Tom Groggin since the 1940s, though captures have occurred immediately downstream (Nankervis, OH 59; Ken Nankervis, pers. com.).

Omeo historian Max Dyer informed the author that cod were occasionally caught in the Limestone area of the Indi River by mountain cattlemen early in the twentieth century (c1920) but he could not recall any details (Max Dyer, pers. com.). An early account of a journey from the headwaters of the Murray to Mt. Kosciusko written in 1879, confirms that both cod and perch were present in the montane zone of the Murray River (*The Queenslander,* 19 July 1879). At a location about four miles downstream of where the Murray River broke up into a series of small creeks it was recorded that 'The clearness of the water enabled me to see distinctly the fine Murray perch and cod – the latter generally sheltered by some overhanging bank and in some back current of still water' (*The Queenslander,* 19 July 1879). From other details recorded in the article, the locality where the fish were observed was upstream of Tom Groggin and about four miles (6 km) downstream of the Limestone Creek junction.

Famous Victorian explorer Angus McMillan, in a letter to the *Argus* in 1864, discussed the possibility of introducing salmon to the headwaters of the Gippsland Rivers. In that letter he outlined an earlier plan for translocating cod into the upper Tambo River from the 'Limestone River', and the details provided suggests that the locality being discussed was either the Murray River near its junction with the Limestone Creek, or the creek itself:

> I recently had the intention to stock the eastern waters of Gipps Land with Murray cod, from the main source of the Murray, where I saw them in thousands. There would have been little difficulty in transporting them, as the distance is only about six miles (*Argus,* 25 June 1864).

The presence of Trout cod and Macquarie perch in similar habitat in the adjacent Mitta Mitta catchment, along with these two newspaper accounts, suggests that these fish species were also originally present and locally common in the montane zone of the upper Murray River.

10.2.2 The Upland Zone

In the uplands zone there are a number of good historical descriptions of the native fish fauna. Cod and Macquarie perch were common in the Mannus Creek near Tumbarumba (Morgan, 1908; Cockburn, OH 47; McGinnity, OH 58) and very common in the Indi River near Biggara around World War One (Lebner, OH 60; McKenzie, OH 54; Len Lebner, pers. com.). Trout cod, Macquarie perch and Blackfish were abundant at Brigenbrong Station at the bottom of the upland zone prior to 1914, as recalled by the late Charlie Mildren (Mildren, OH 53; Jack Rhodes, pers. com.). Both Trout cod and Murray cod were present near Bunroy, as well as Macquarie perch in the 1940s (McKenzie, OH 54).

In the upland zone of the Cudgewa Creek, the construction by aboriginal people of fish traps at Kalangee suggests the presence of a significant native fish population (Carmody, 1981). 'White eyes' (Macquarie perch) and greasies (Blackfish) were recalled by the late Jack Ottey as being regularly captured in the Berringama Creek, an upland tributary of the Cudgewa Creek, around 1910 (Ottey, OH 53). A few 'bluenose' (Trout cod) were also taken from time to time out of the Berringama Creek by Ottey, but were commonly captured by him from the Cudgewa Creek at Kalangee until about 1920 (Jack Rhodes, pers. com.). Cod were present at greater elevations in the Cudgewa Creek, being common at Lucyvale up to the end of the 1920s, with captures persisting into the 1930s (Turnball, OH 92; Alec Turnball, pers. com.).

The collective evidence demonstrates that Macquarie perch, Trout cod and Blackfish were once common in much of the upland habitat of the upper Murray catchment. They penetrated upstream to major barriers such as the Berringama Falls (Ottey, OH 53) and the falls near Flat Rock on the Koetong Creek (Grant, OH 55). Murray cod have been reported from the Murray (Indi) River as far upstream as Biggara (Tom Jarvis, pers. com.) and although it has not been reliably reported from the smaller streams, it is thought that they were probably present.

10.2.3 The Slopes Zone

For the slopes zone of the upper Murray there is a considerable amount of material available on native fish populations, with substantial oral histories provided by a number of individuals. Cod were abundant in the Murray River and a commercial fishery existed as far upstream as Talmalmo (Grant, OH 55). Their abundance is demonstrated by a number of photographs recording large catches upstream between Burrowye and Tintaldra (MR2, 3, 4, 5, 20, 23, 24 & NSW State Library 'At Work & Play' 00954). At Burrowye and Tintaldra, Trout cod were recalled by 90 year old Roy Grant up to the 1930s, to have been more common than Murray cod, though the latter were also very common to abundant (Grant, OH 55; Jarvis, OH 56; Walton, OH 57). Grant, who was the oldest surviving resident, was adamant that as a boy in the late 1920s he caught far more Trout cod than Murray cod at Burrowye, particularly small fish (Roy Grant, pers. com.).

Further downstream at Albury, cod were abundant and such were their numbers that in a large flood in 1889 they were observed swimming around the streets of the town (*Argus,* 16 September 1889). They were also present in large numbers in some lagoons (*Sydney Morning Herald,* 15 January 1930). Both cod species were recorded as being 'numerous' during a survey in 1928 (NSW Fisheries Report, 1928), though Trout cod were suggested to have been less common than Murray cod at Wodonga around 1900 (McFarlane, OH 53). The reported differences in the abundance of Trout cod at the bottom of the slopes zone may be the result of population changes over time, or local variations in abundance associated with habitat. A number of good quality photographs exist containing images of Trout cod originating from Brigenbrong (MR104 & MR105), Tintaldra (MR22) and Burrowye (MR1). These photos confirm the species presence, and are supported by a

number of other images of lower quality. Trout cod were also collected from the upper Murray near Tintaldra by John Lake during the early 1960s; this area was his main source of specimens of the species (Pratt, OH 41; Vick Pay, pers. com.).

Until the 1930s, Trout cod were very common in the slopes zone of the Cudgewa and Koetong Creeks. Murray cod were also present but less abundant, with the largest reported being a 37 lb. (16.8 kg) fish (Grant, OH 55; Grattidge, OH 97; *Argus,* 5 February 1935). Cod were also very common in other large creeks including the Corryong and Nariel Creeks, as well as being present in smaller streams such as Horses and Thowgla Creeks (Grant, OH 55; Jarvis, OH 56; Lebner, OH 60). The overall picture for cod in the upper Murray is that both species were abundant at the bottom of the slopes zone near Albury, and that the abundance of Trout cod relative to Murray cod increased progressively upstream. At Burrowye and Tintaldra, Trout cod exceeded Murray cod in abundance; in the feeder streams Trout cod were far more prevalent. In lagoons in the Wodonga area Murray cod were common but Trout cod were absent (McFarlane, OH 53; *Sydney Morning Herald*, 8 February1907; *Argus*, 16 February 1912).

Macquarie perch were abundant in most habitats in the slopes zone. In the Murray River they were very common near Wodonga (McFarlane, OH 53; Jack Rhodes, pers. com.) and described as 'plentiful' during a survey near Albury in 1928 (NSW Fisheries Report, 1928). They were reported to have been abundant at Burrowye and Towong until the 1920s, with an account of the species filling nets (Grant, OH 55; Lebner, OH 60). A good quality photograph exists of a specimen taken near Towong (MR16). They were also abundant in the larger creeks such as the Nariel Creek (Nankervis, OH 59) as well as being present in lagoons (McFarlane, OH 53).

The oldest detailed account dating from the 1890s at Wodonga, described Golden perch and Silver perch being present in the Murray River and lagoons in 'significant numbers' (McFarlane, OH 53). Both species were captured at Albury during a survey in 1928, with Golden perch being described as taken 'at intervals and in the case of Silver perch eleven ripe males were caught in one net' (NSW Fisheries Report, 1928). Further upstream at Burrowye, Roy Grant's father regularly captured Silver perch in small numbers until the 1920s (Grant, OH 55; Roy Grant, pers. com.). A high quality photograph records the capture of a Silver perch at Burrowye (MR9) confirming their presence in the area. Golden perch were recorded by Langtry from Burrowye (Cadwallader, 1977) though oral history indicates that, while regularly taken, they had never been considered to be a common fish in the area; being a little less frequently captured than Silver perch (Grant, OH 55; Roy Grant, pers. com.). Occasional captures occurred near Towong (Lebner, OH 60) and in the lower reaches of the Mannus Creek (McGinnity, OH 58). Overall, Golden perch and Silver perch appear to have been fairly common near Albury, but steadily declined upstream to be rare. They were, however, regularly taken at the top of the slopes zone.

Newspaper accounts record Catfish being present in lagoons near Albury (*Sydney Morning Herald*, 8 February 1907) and abundant near Bonegilla (*Argus*, 16 February 1912). Oral history recalls Catfish to have been abundant in lagoons near Burrowye (Grant, OH 55) and Towong (Jarvis, OH 56; Lebner, OH 60). They were regularly captured in the river itself at Doctors Point near Albury (Grant, OH 55; Roy Grant, pers. com.), at Towong (Jarvis, OH 56**;** Tom Jarvis, pers. com**.**) and in backwaters in the Swampy Plains River near Khancoban (Lebner, OH 60). Blackfish were taken at Tintaldra (Jarvis, OH 56) and are recalled to have been abundant in the Murray River near Towong and in the lower reaches of nearby creeks (Lebner, OH 60; Len Lebner, pers. com.). A news story written by a Wodonga resident recalled catching Blackfish in 'small creek holes' in the 1890s (*Argus,* 27 May 1927); an Albury resident reported their presence in billabongs near the Murray River (*Argus,* 12 February 1926). Ogilby (1913) reported Blackfish to have been common in lagoons near Albury. Small numbers of eels were also captured in the Khancoban area in the early 1950s (Pendergast, OH 91).

10.2.4 Estimates of Native Fish Abundance in the Upper Murray River Catchment at European Settlement.

Presented are the rarity scores used in the *Sustainable Rivers Audit* (Davies *et al.,* 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 10.1 Upper Murray River Catchment Rarity Scores (Main River Channels)

	Slopes* (Wodonga West to Towong Upper)		**Upland*** (Towong Upper to Tom Groggin)		**Montane** (Upstream of Tom Groggin)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod	3	**5**	3	U3	0	L3?
Murray cod	3	**L5**	1	1	0	?
Golden perch	1	U1	0	0	0	0
Silver perch	1	L3	0	0	0	0
Macquarie perch	5	**5**	3	U3	1	L3?
Catfish	0	**L3**	0	0	0	0
'Blackfish'	3	U3	5	5	5	L5

Key
0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type supported by multiple accounts or lines of evidence e.g. oral history, newspaper accounts, photographs.

* Note: The boundaries used for this zone differ slightly from those used in the *Sustainable Rivers Audit*

Figure 10.2 Historical Records for Murray cod and Trout cod in the Upper Murray River Catchment

(Note: Records in the Albury-Wodonga Area are presented in the map in the section on the Central Murray River Catchment)

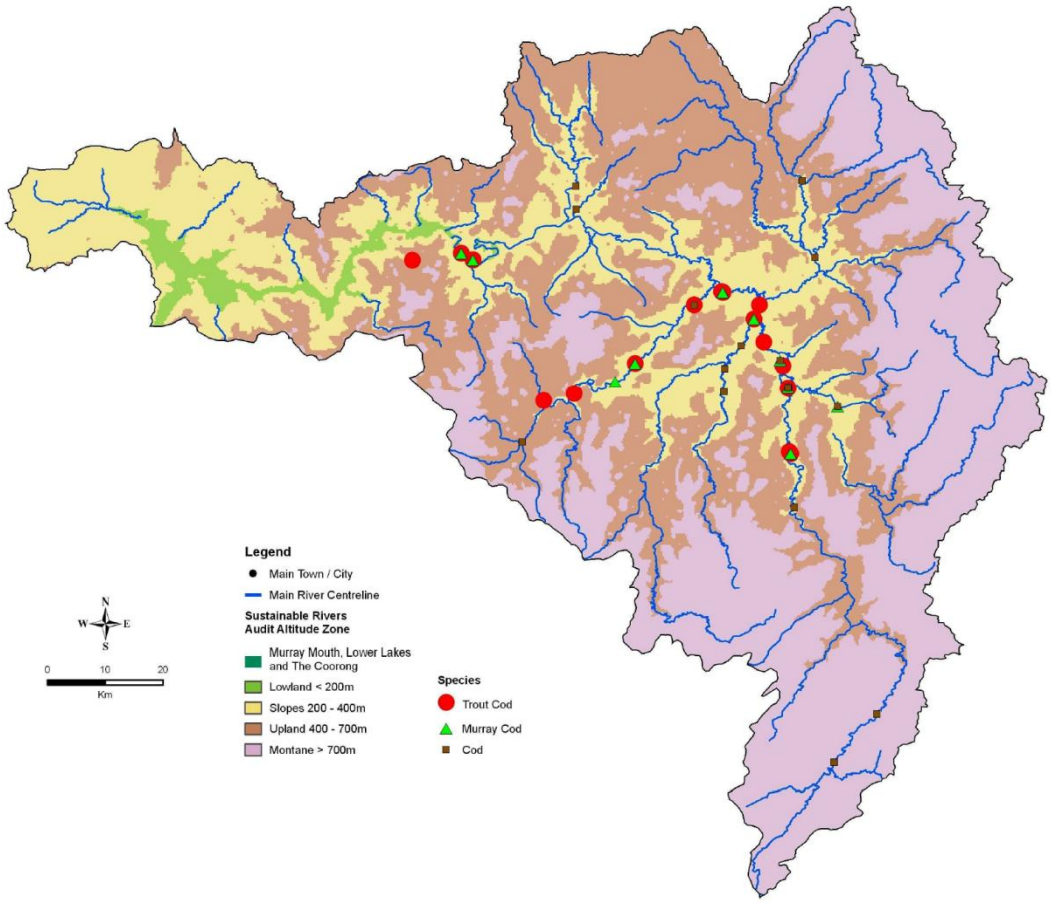
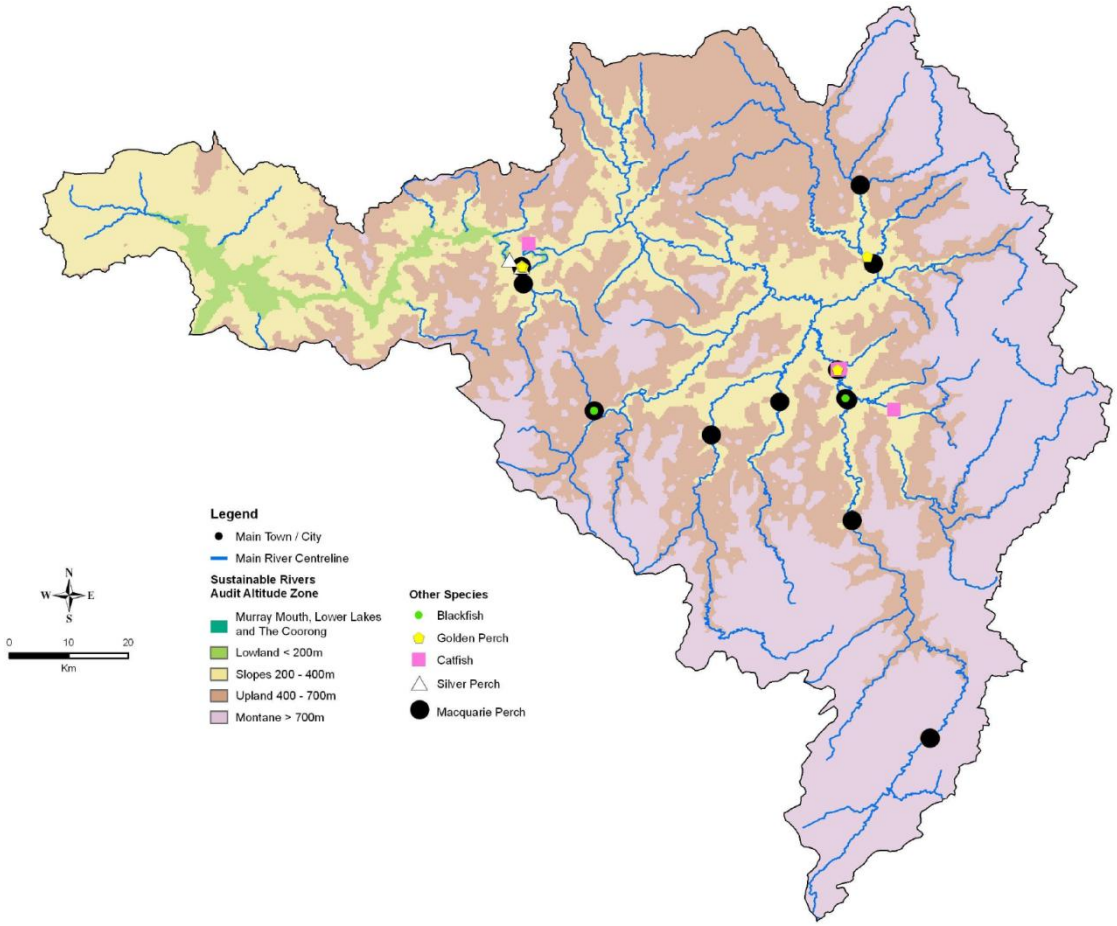
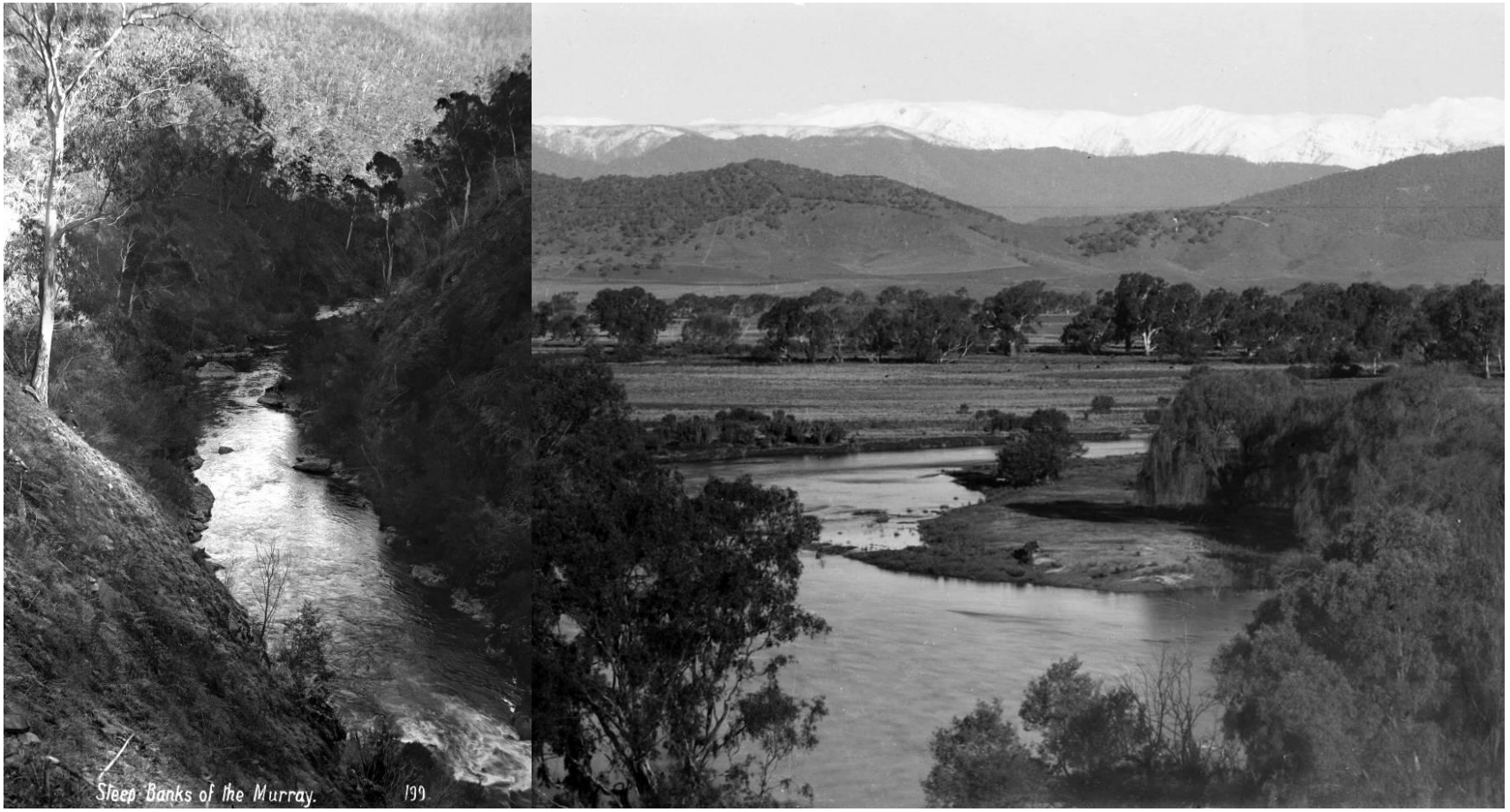


Figure 10.3 **Historical Records for Native Fish Species other than Cod in the Upper Murray River Catchment**

(Note: Records in the Albury-Wodonga Area are presented in the map in the section on the Central Murray River Catchment)





Left, Photo MR 79: The Indi River in the Biggara area downstream of 'Murray Gates' c1910. At the time 'Lightwood' Bill Pendergast and Aussie Rickson enjoyed excellent angling for 'cod and bream' in this upland habitat as recalled by Len Lebner. Today the river looks much the same but native fish are now rare captures.

Right, Photo MR86: The Murray River from Farrans Lookout, Jeremal Creek Junction, between Towong and Tintaldra c1910. It is evident that by this time the slopes zone of the Upper Murray had taken on a familiar present day appearance with the valley floor and gentler slopes largely cleared. From the stories recalled in 1910 the river supported large populations of Trout cod, Murray cod and Macquarie perch with Catfish being common in the adjoining billabongs. Both photos courtesy of John Whitehead.

Photograph 10.2 Indi River Catch

Photo MR 16: Len Lebner's mother Nell Garing (background) is in this portrait containing two fish caught from the Indi River at Brays Point, near Towong Upper, c1927. The fish on the left is a Macquarie perch while that on the right is a cod which shows evidence of speckled markings (enlarged). Macquarie perch had once been abundant in the Indi River and nearby creeks including the Nariel and Cudgewa. During the early 1920 they underwent a dramatic decline with residents recalling them to be scarce by the 1930s. Photo courtesy of Len and Betty Lebner

Photograph 10.3 Towong Cod

Photo MR 15: Len Lebner's father with two cod captured from the Indi River at Brays Point c1935. The fish on the right may be a Murray cod suggested by the head profile, body morphology and the vague body markings while that on the left may be a Trout cod with a strongly pointed snout and evidence of speckled markings when the image is examined at high resolution. There is not enough detail to reliably identify either fish. Len described the past existence of beautiful sandbanks on the lower Indi as evident in this photo. Also apparent are well established Willows. Photo courtesy of Len and Betty Lebner.

Photograph 10.4 Tintaldra Trout Cod

Photo MR22: Tom Jarvis' brother Joe Jarvis (right) and Ian Russell (nephew of Tom Jarvis) with three cod caught from the Murray River at Tintaldra c1953. The fish on the right was recalled to be a Trout cod. An eye stripe is visible, very fine speckles are evident, particularly near the shoulder and head and a long caudal peduncle is obvious when compared to the other fish. Even though the mouth is agape the top jaw appears longer. The fish on the left is a Murray cod while that in the centre cannot be identified with certainly but is probably a Murray cod. By this time Trout cod, while still regularly captured, had undergone a significant decline in abundance in the region though Tom recalled the species to have been prevalent during his childhood. In the early 1960s the Tintaldra area was the source of most of the Trout cod captured by John Lake, which probably influenced him in concluding that the species preferred the upper reaches of the rivers. Photo courtesy of Tom Jarvis.

Photograph 10.5 Tintaldra Cod Catch

Top, Photo MR20: Tom Jarvis (centre) with his father Ivan Jarvis and six cod caught from the Murray River between Towong and Tintaldra, near the Jeremal Creek Junction c1943. The large fish on the right weighed 35 lb. (15.9 kg), while the smallest fish weighed eight lb. (3.6 kg). Tom reported some of this catch to be 'rock cod' (= Trout cod). Close examination of the photographs indicates that some may be Trout cod, distinguished by their long, strongly pointed snouts, long caudal peduncles and displaying dashed markings in the original photo when enlarged.

Bottom, part of Photo MR 21: This second image of the same catch shows the fish at different orientations. The blotches seen on the three fish on the left are mud and grass, this being more apparent in the lower photo. Photos courtesy of Tom Jarvis.

Photograph 10.6 Trout Cod and Silver Perch at Burrowye

Photo MR1: Stan Grant holding a 'rock cod' (= Trout cod) weighing about 17 lb. (7.7 kg) captured at the junction of the Burrowye Creek c1930/32. The overhanging upper jaw confirms its identity, with an eye stripe just visible. The fish is in superb condition, with fat layers visible in the dorsal region. Roy Grant told the author on several occasions that small 'rock cod' were abundant at Burrowye in the 1920s and more frequently taken than Murray cod. By the mid 1930s small cod had become scarce and the proportion of Trout cod in the total cod catch had declined.

Photo MR9: A Silver perch, labelled as 'unknown fish' on the photo, caught by Stan Grant at Burrowye, 1951. That the Grant brothers could not identify the fish demonstrates the rarity of the species upstream of Lake Hume after the 1920s. Both photos courtesy of Roy Grant.

Photograph 10.7 Burrowye Cod Catch

Photo MR2: A fishing party holding part of a catch of cod taken at Fred Dick's camp, Riverlea near Burrowye, c1936. The catch included Murray cod and Trout cod. By this time the cod fishery was decline and Trout cod, while still regularly captured, were no longer abundant. Photo courtesy of Roy Grant.

Photograph 10.8 Huge Cod Catch at Burrowye

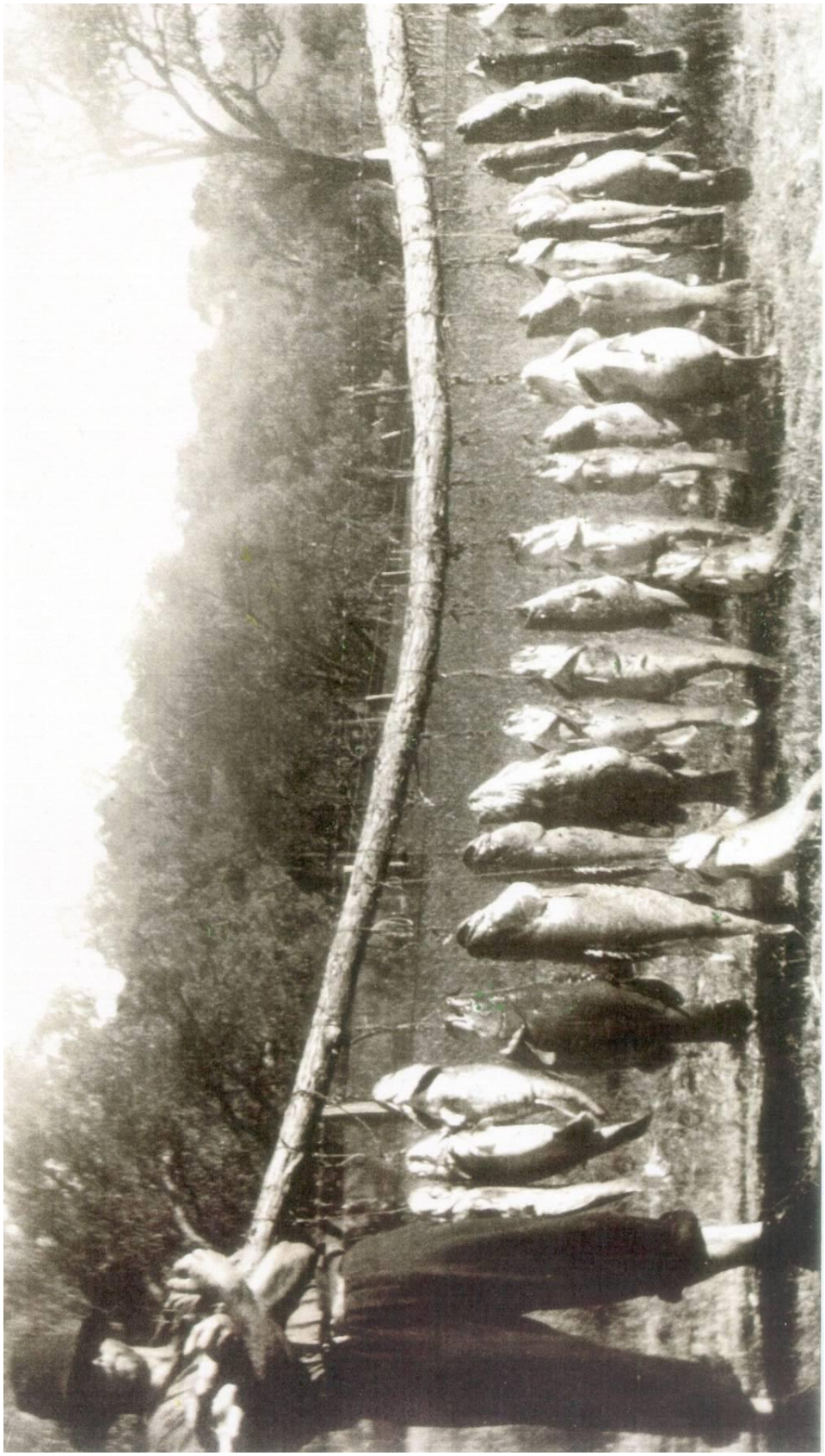


Photo MR5: Jack Brown holds a catch of 24 cod, including both Murray cod and Trout cod caught at Riverlea near Burrowye, c1939/40. Roy Grant identified the dark fish, facing side-on, 4th from left as a 'rock cod'. When the image is enlarged the animal is covered in black speckles. Murray cod can be identified by their flattened, rounded heads, while some other fish are probably Trout cod as suggested by their strongly pointed snouts (eg. 2nd and 4th from right) and other fish have long caudal peduncles. Roy recounted this to be the last of the big catches of cod of either species, with the proportion of Trout cod having been in decline for a decade. The image confirms emphatically that cod had once been abundant in the slopes zone of the upper Murray River. Photo courtesy of Roy Grant.

10.3 The Changes

10.3.1 Changes to Native Fish Distribution and Abundance

While concern was expressed about the fishery as early as 1870 (*Argus*, 12 December 1870), it is only around the time of World War One that major changes in native fish populations were first recorded in the upper Murray. In the upland zone Trout cod, Macquarie perch and Blackfish were abundant in the Indi River around 1914, but after that time went into serious decline (Mildren, OH 53). By the 1930s, Macquarie perch were scarce in the Indi River though still taken in small numbers, with the last reported captures occurring near Bunroy in 1980 (McKenzie, OH 54; Lebner, OH 60). Small numbers of Trout cod and Murray cod were still being captured near Bunroy in the 1940s (McKenzie, OH 54) but by the 1960s cod were rare in the Indi River (Len Lebner, pers. com.). Similarly, Macquarie perch and Blackfish disappeared from the Berringama Creek after about 1920 (Ottey, OH 53), and cod had vanished from the upper Cudgewa Creek by the 1930s (Turnball, OH 92).

In the slopes zone both Trout cod and Murray cod remained very common at Burrowye, Tintaldra and Towong until the 1930s, though several people noted by that time the juvenile cod had become scarce with fewer, larger, cod being caught (Grant, OH 55; Jarvis, OH 56; Lebner, OH 60). From the early 1930s Trout cod noticeably declined in relative abundance compared to Murray cod, though were regularly taken into the 1960s (Grant, OH 55; Jarvis, OH 56; Walton, OH 57; Handorf, OH 63). The last reported captures of Trout cod upstream of Lake Hume occurred near Burrowye in 1970 (Grant, OH 55) as well as near the Brigenbrong Bridge in 1972 (Rod Harrison, pers. com.). Murray cod became generally scarce upstream of Lake Hume by the 1960s, though occasional captures continued to take place (Roy Grant & Bill Willis, pers. com). By the late 1930s, downstream of Lake Hume cod were rarely taken near Albury (McFarlane, OH 53).

Macquarie perch had been abundant near Burrowye and Towong in the Murray River, as well as being found in nearby creeks in the early 1920s, however, by the mid 1930s they were only taken in small numbers (Grant, OH 55; Lebner, OH 60). Further downstream the species was common at Albury in 1928 (NSW Fisheries Report, 1928) but then underwent a dramatic decline and were absent shortly after that time (McFarlane, OH 53). Golden perch and Silver perch had virtually disappeared at Burrowye by the 1930s, with the last Silver perch being taken in 1951 (Grant, OH 55; photo MR9). Further downstream at Wodonga, native fish were rare and Silver perch absent from the mid-1930s onwards, with the last Golden perch being captured in 1942 (McFarlane, OH 53).

During a drought around 1920, Catfish were reported to die in large numbers (Grant, OH 55) and after this time there are few accounts of the species in the catchment. A single specimen was taken from a lagoon at Burrowye in 1935 (Grant, OH 55), and a relic population of Catfish was reported as surviving in a lagoon near Albury by Langtry around 1950 (Cadwallader, 1977). There is also a report that a small population persisted in a billabong near Khancoban into the 1950s (Norris, OH 71).

10.3.2 Changes to Habitat

The upper Murray region itself was not particularly auriferous, with minor workings taking place near Tom Groggin, Corryong, Bethanga and Granya. More extensive alluvial mining did take place in the Tumbarumba area, and limited extraction of tin from the upper Cudgewa Creek occurred (Morgan, 1908; Flett, 1979). For the most part the catchment was largely spared from the extensive damage caused by broad scale alluvial mining. A major goldfield developed in the lower Mitta Mitta River valley and it appears that alluvial workings in that catchment may have impacted upon water quality in the Albury area from time to time (NSW Fisheries

Report, 1907). River boat traffic extended as far upstream as Albury, and the Murray River to that point had been largely cleared of snags by 1869 (*Riverine Herald,* 19 June 1869).

The first exotic fish species introduced to the upper Murray were Brown trout, which were provided by NSW State Fisheries to the Albury Municipal Council 1892. Where they were actually released is unclear (NSW Fisheries Report, 1892). By 1905, trout were prevalent in a number of upland streams including the Mannus and Bells Creeks, the Marangle Creek and tributaries in the Tooma area (NSW Fisheries Report, 1905). It appears that trout arrived in the Indi River at Brigenbrong around 1918 after which they proliferated and were linked to a decline in the Trout cod and Macquarie perch populations (Mildren, OH 53). Trout were first stocked into the Burrowye, Berringama, Nariel and Running Creeks in 1911 (*Argus,* 11 May 1911) and are reported to have replaced the Macquarie perch population in the Berringama Creek by the 1920s (Ottey, OH 53).

Goldfish carp were present in the Wodonga area by 1908, with Redfin perch appearing in 1912, and Tench in 1942 (McFarlane, OH 53). An anecdote, repeated by several senior residents of the area to the author, is that the first Redfin perch captured at Albury was obtained by a woman washing her clothes in the river. They were recorded as being present in great numbers at Albury by 1921, and are suggested to have had a major impact on native fish (NSW Fisheries Report, 1921; *Argus*, 3 July 1935). Redfin perch were common in the Murray River, billabongs and the lower reaches of the inflowing creeks in the Tintaldra/Towong area by the early 1930s, and were implicated by local anglers in the decline of Macquarie perch (Jarvis, OH 56; Lebner, OH 60; Len Lebner, pers. com.). Near Burrowye the appearance of large numbers of Redfin perch was linked to a decline in the native fishery, particularly in lagoons where they replaced Catfish (Grant, OH 55). English roach were present in the Albury area by the 1920s, but do not appear to have become common (*Argus,* 23 January 1923). In the early 1970s European carp became common in the upper Murray and, coinciding with their arrival, was a dramatic decline in the Redfin perch population and increased turbidity of the water (Jarvis, OH 56; Tom Jarvis, pers. com.).

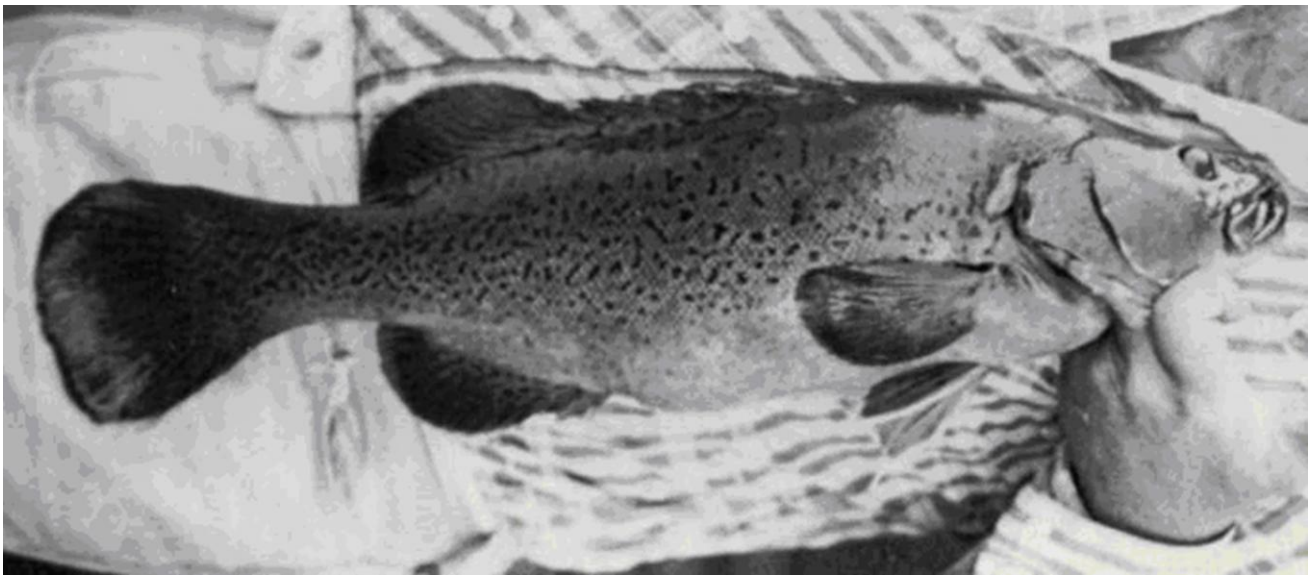
As early as 1870 extensive illegal fishing is reported to have impacted on the fishery (*Argus*, 12 February 1870) and oral history recalls the use of illegal traps near Towong (Lebner, OH 60). Ongoing concern expressed by Albury residents led to some local closures to commercial fishing by 1907, but in 1928 it was still suggested that overfishing had further reduced stock (NSW Fisheries Reports, 1907; 1912; 1928). Extensive illegal overfishing near Burrowye had a serious impact on the cod population in the 1930s, though a decline of the cod fishery was already evident (Grant, OH 55). Further declines of the cod fishery in the region coincided with major bushfire events in 1939 and 1952, killing fish directly and modifying the aquatic habitat (Grant, OH 55; Bill Willis, pers. com.).

As early as 1863, controlling the waters of the upper Murray and storing them to guarantee water supply during droughts for pastoral and domestic use was contemplated. The first major project to do this was the construction of the Hume Weir upstream of Albury. Construction of the weir commenced in 1919 and was completed in 1931, with the storage filling in 1936 (Eaton, 1945). From around 1920 native fish populations upstream of the man-made barrier were isolated from the rest of the Murray-Darling Basin. After filling between 1929 and 1934, the dam was repeatedly treated with copper sulphate to control algae (Cadwallader, 1977). The copper sulphate killed cod in the weir (*Argus,* 17 January 1933) and caused massive fish kills as far downstream as Barmah (Cadwallader, 1977), Gunbower (*Argus*, 28 January 1930), Mildura and areas in South Australia (*Sydney Morning Herald,* 28 November 1929; *Adelaide Advertiser,* 30 July 1930). In one lagoon near Albury, 200 cod from 30 to 80 lb. (13.6 to 36.4 kg), as well as perch were killed (*Canberra Times,* 15 January 1930; *Sydney Morning Herald,* 15 January 1930). The high concentration of the copper sulphate caused extensive corrosion of the steel sluice gates necessitating their repair. This included coating with lead paint

and the complete draining of the weir in 1930 (*Sydney Morning Herald,* 2 April 1930). It effectively eliminated the resident native fish population in the dam, river and lagoons to Howlong (Cadwallader, 1977; McFarlane, OH 53; NSW Fisheries Reports, 1929; 1930). Below the dam, subsequent to the copper sulphate treatment, Redfin perch, Goldfish and Brown trout dominated the fish fauna downstream to Corowa (*Argus*, 3 July 1935; Cadwallader, 1977).

Work commenced on the enlargement of the Hume Dam during the 1950s, with construction being completed in 1961. In the 1950s, the construction of the Snowy Mountains hydroelectric scheme dams, resulted in changes to the flow and thermal regimes of the Swampy Plains, Tooma and Murray Rivers upstream of Hume Dam. The Murray River immediately downstream of Lake Hume has seen a reduction in summer temperatures of 5-7 °C when the dam is near capacity. The thermal pollution of the Murray by the dam is exacerbated by the cold water releases from the Dartmouth Dam on the Mitta Mitta River, and inflows into the upper Murray from the Snowy Mountains Scheme (Ryan *et al.,* 2001).

Photograph 10.9 Last Upper Murray Trout Cod



Photos MR104: This Trout cod was captured by angling writer Rod Harrison just downstream of the Brigenbrong Bridge near Towong Upper c1972. It was reported in the October 1976 edition of *Fishing World* magazine with the capture site being given as Hume Weir to mask the location of what was a relic population. This image represents the end of the wild Trout cod population in the Upper Murray, the Indi River as described by Charlie Mildren in the early years of the twentieth century as carrying 'a great number of bluenose'. Photo courtesy of Rod Harrison.

10.4 The Current Situation

The *Sustainable Rivers Audit* concluded that 'The Upper Murray Valley fish community was in Extremely Poor Condition. Less than half the predicted native species were caught, and alien species, mainly trout, were 96% of total biomass and 74% of total abundance' (Davies *et al.,* 2008). By the early 1970s, the native fish population of the region was restricted to relatively small numbers of Blackfish, and relic populations of Murray cod in the Murray River and Macquarie perch in the Mannus Creek. The populations of Trout cod, Golden perch, Silver perch and Catfish in the upper Murray had become extinct.

Today there is evidence of Blackfish returning to some creeks in the region. Macquarie perch have all but disappeared near Tumbarumba, but small numbers are still captured in the lower Manus Creek. Lake Hume contains a very good Golden perch fishery, created through ongoing stockings of fingerlings. Stockings of Silver perch have produced few captures. The Cudgewa Creek is receiving liberations of Murray cod fingerlings which have created a small fishery, and stockings have produced a reasonable population of Murray cod between Tintaldra and Lake Hume. Occasional captures have also taken place in the Bunroy area. A small Trout cod population, created by the liberation of a relatively low number of fingerlings in the late 1980s, exists downstream of Tintaldra. Reported captures of juveniles suggests that reproduction has occurred. Near Albury regular captures of Murray cod and Golden perch are taking place, with occasional captures of Trout cod. All of these fisheries in the upper Murray are shadows of those that once existed.

10.5 Newspaper Highlights

Argus, 12 February 1870
Country News. A fine bream of unusual size (7lb.) was caught a few days ago in the Upper Murray at Talmalmo. Fish of large size are becoming more and more scarce owing to reckless and wholesale use of nets and traps during the spawning season.

Sydney Morning Herald, 8 February 1907
Fisheries Matters. / The Municipal Council of Albury asked that the Horseshoe and Doctor's Point Lagoons, in the Albury district, might be closed against net-fishing on account of trout having been liberated in these waters. The board found that the lagoons were chiefly stocked with cod, catfish, and perch, and did not consider the places were suitable for trout.

Argus, 3 July 1935
Murray Cod Are Disappearing. Do Perch Eat Them? Hatcheries Suggested. Albury (N.S.W.). Tuesday – Anglers in the border districts are alarmed by the great scarcity of cod and bream in the River Murray and its tributaries, and are of the opinion that action should be taken to restock the Murray, at least with cod. The river is teeming with English perch, which, it is said, attack young cod.

10.6 Significant Extracts from the Annual Reports on the Fisheries of NSW

1907
Information was received from the Corowa Anglers' Club, that the waters of the Murray River were being polluted to such an extent by mining operations on the Mitta Mitta and Kiewa Rivers—tributaries of the Murray flowing through Victoria—as to cause the destruction of fish-life, and representations were made to the Victorian Government by the Premier of this State with a view to having the nuisance abated.

1921
Great numbers of English perch and carp were netted in shallow waters near Corowa and Albury, while indigenous fishes were in negligible quantities. The voracious English perch is rapidly increasing in numbers in the Murray River and adjacent creeks, &c., and becoming a serious menace to the fishery.

1928
Depleted Waters- Reiterated statements were received from shire and municipal councils and anglers that the Murray River was sadly depleted; few fish could be caught, and prohibition of net-fishing was urged. The anxiety so often expressed was proved to be groundless; investigations conducted by the Department in about 4 miles of the Murray River below Albury, in waters that have been consistently worked by net-fishermen for twenty years, resulted in the capture in thirty-six days of 756 fish, most of which were returned to the river after examination. No fish under lawful length were taken – they would, of course, escape through the 4-inch mesh nets employed; several Murray cod exceeding individual weight of 25 lb. And large numbers from 5 lb. upwards were captured. Macquarie perch were found to be plentiful.

Artificial Propagation of Western Fishes was the primary objective of the above investigations, which were undertaken during the close season – October and November. Almost every day Numerous Murray cod and trout cod, and at intervals golden perch, were caught in the nets, many of the females being ripe and actually extruding their eggs, but no ripe males of either species were taken. In the case of silver perch eleven ripe males were caught in one net, yet no ripe females were captured. Attempts were made to fertilise the ova of

trout cod with milt from male silver perch, but without success. No ripe Macquarie perch of either sex were captured. Operations were abandoned on 30th November, as the river had run down to the very low level and funds were not available for continuance.

1929

Fish Mortality and Pollution of Waters at Hume Weir, due to sudden submersion of lands hitherto untouched by floods, and release of silt from lagoons within this submerged area, is believed to have been the cause of considerable mortality among indigenous fishes in Hume Reservoir which occurred during November. Exhaustive inquiries and investigations at twenty-eight centres along Murray River showed that no serious mortality occurred between Hume Weir and Wentworth; dead fish were seen floating past Cal Lal in considerable numbers, but no information could be obtained as to whence they came; it is considered that the cause of death was merely local and confined to a small area.

/ Murray River was very seriously polluted due to Hume Weir storage, but fish were not affected thereby. Some mortality occurred due to muddy effluent after storms.

/ Many fish, estimated at 2,000 lb. aggregate weight, were destroyed presumably by explosives in Hawkesview lagoon. Among the dead fish were Murray Cod up to 40 lb. individual weight.

1930

Inspector's Report-

/ The quantity of fish consumed in Albury was between 300 and 400 lb. per week. No locally captured fish was consigned to markets / Murray cod and perch were generally plentiful; English perch were very numerous in Murray River. / During the year Hume Reservoir became seriously polluted by algae, but this did no harm to the fish. Owing to the financial position but few patrols were made: unlawful fishing was very prevalent. Several muddy freshets occurred, but without injury to the fishery and enabled fish to move upstream. Fisheries conditions at the end of the year were satisfactory. No diseases or pests were observed. Some very large Murray cod were caught by anglers – largest reported weighed 75 lb. English perch have become very numerous - more so than for some year; anglers report capture of as many as 200 in a few hours, up to 4 and 5 lb. weight. No golden perch are known to have been taken above Tocumwal for a number of years – these fish do not appear to travel above Moira Lakes. Since water has backed up by Hume Weir, cormorants have collected in great numbers, and new rookeries have been observed. These birds appear to destroy large numbers of the outlawed English perch.

10.7 Upper Murray River Catchment Oral Histories

The following oral histories (OH 53-60) mostly discuss the Upper Murray Catchment.

OH 53

Jack Rhodes has kindly provided permission for these paragraphs from his book (Rhodes, 1999) to be re-published. Included are oral history provided by Alf and Erskine McFarlane of Wodonga West, Joe Ottey of Berringama and Charlie Mildren on Tom Groggin.

The Changing Scene

Lingering in my mind over many years has been the question of whether some poaching activities really mattered. However, to retain, if not improve, our wild populations the law of the moment must be enforced. Fortunately, there is a growing recognition that for the wellbeing of all creatures, including man, we must restore and maintain all habitats at the best possible levels and reverse poor environmental practices. It has been almost as though we have believed that apart from our own little project area, nothing would be affected or changed regardless of whatever we did. Now there is abundant evidence that this is not true. These observations are born of that clearest of all vision, 'hindsight', which together with long-term observations creates a realisation that there have been serious changes. For fish and wildlife, the changes to original populations in some cases have been so slow and subtle as to be almost unnoticed, in others sudden and dramatic.

There is something of a parallel in what we each experience by looking at our image in a mirror on a day to day basis and then at the photograph of years ago. Each day we appear exactly as we did yesterday, however the photograph shows the accumulated change.

After hearing older men talk of the changes to the fish and wildlife populations and habitats in the north-east of Victoria, I set out to solicit and record the information. Although only anecdotal it was all first hand, but I was disappointed that what I compiled did not survive in the records of the department, either in Melbourne or Wodonga. So, I am left to rely only on a few scraps of my original notes.

Of immense value in particular were two brothers, Alf and Erskine (Rusty) McFarlane. It was the very good fortune of the Rhodes family to become close friends. Each born before the turn of the century, they spent the early years of their long lives on a hill property near the top of Ingrams Road at Wodonga West. Excellent bushmen, they were extremely observant and through necessity and circumstances, not to mention natural inclinations, were born fishermen and hunters. Having been taught by their elders, they brought forward a glimpse of yet an earlier generation.

In fishing, Alf and Rusty had the guidance, when boys, of a man of German origin named, Louie Haeusler. Louie also lived at Wodonga West and manufactured the fishing lines they used out of strands of horsehair, pulled only from the tail of a stallion or gelding. He would take the boys back into the hills to select long, thin stringy-bark saplings which when barked, stacked straight and dried, become their fishing poles. The lines were tied directly to the end of the poles and all fishing was with a float using worms, freshwater mussels, or cockchafer grubs for bait. Fishing mostly in lagoons, the bait was cast just beyond the band of aquatic plants that formed the universal margin of several metres around all flood plain lagoons before the appearance of European carp in the early 1970s. When hooked, small fish up to a kilo or so were subjected to an up country swing and a flight to the bank, while larger fish were dragged through the waterweed. If a very large fish was hooked, the rod was tossed onto the water allowing the fish to tow it around until it tired. The rod was then retrieved and the fish pulled to the bank.

Bearing testimony to environmental change in the Murray Valley over countless centuries is the mining or extraction of the very extensive and deep water worn gravel and sand deposits across the valley floor. Situated below several metres of overburden, the deposits extend deeper than the thirty-metre level to which they are usually worked. Below that level problems associated with the watertable and buried ancient timbers are two factors affecting the economics of extraction. Extracted in open pit style of operations the deposits support an industry supplying materials used in road-making, concrete mixing and building and site foundations.

As an example of relatively recent change, it is difficult to imagine, when standing on the concrete bridge over the top end of Travellers Creek at Wodonga West that this creek did not exist until a flood in 1917. Until that time, there was a chain of lagoons along the future course of the creek. From upstream these were Woodlands, Travellers, Rushy, Scott's, Noxall's, Willow Tree and Mother Langheim's Hole. The 1917 flood, which connected these lagoons with an at first small creek, was apparently recorded as being 25mm (one inch) higher than a very big flood in 1870. Until the formation of the creek, Alf and Rusty's father hauled red gum logs from the river flats up to the main road with a team of horses.

Successive floods and high irrigation levels in the river after the construction of Hume Dam, have enlarged the creek until it now diverts a very significant percentage of the Murray River's total flow for a distance of about five or six kilometres. There has been a need to build larger and better bridges where the concrete bridge now stands. Previously the structures had been of timber, and several alterations took place after I arrived in Wodonga.

Little evidence of the original chain of lagoons now remains. But they, along with the still existing Rushy, Horseshoe, Edwards and Circular Lagoons of that area, as did the other lagoons on the Murray flood plain, carried a variety of native fish – Murray cod, callop (yellow belly), Macquarie perch (white eye), Silver perch (grunter), and Catfish. In the Murray River the predominant fish was the Murray cod with a smaller number of Trout cod (blue nose), and a significant number of Macquarie perch, Silver perch and callop. Goldfish carp was first seen in the lagoons in about 1908 – this was an estimated time by Alf and Rusty, but it was before the recorded date of 1912, when Alf caught his first English perch (redfin) in the Murray River.

After completion of the Hume Dam when the reservoir started to fill, the rotting vegetation of the flooded forest created a problem by generating hydrogen sulphide. An attempt to solve the problem was made in 1932 by treating the reservoir with copper sulphate. This caused enormous fish kills down stream in the river and anabranches, then later in the lagoons when swept there by floods. Alf and Rusty helped to remove from some lagoons the many tons of dead native fish before the water became undrinkable to stock. By 1937, brown trout and redfin had become the predominant fish in the down stream waters below Hume Dam. Alf had a record of taking one brown trout weighing 5.4 kg (12 lb.) in that year. Until 1940 all the trout they caught below the dam, with the exception of one rainbow, were brown trout.

In about 1940, Alf and Rusty saw a tench taken from Rushy Lagoon near Travellers Creek. It was the first fish of this species they had seen. Then in 1942, during World War II, Rusty caught a callop from the Murray River at Dights Hill. Other than an occasional Murray cod from the river, they never again saw or heard of any native fish being taken from either the lagoons or the river...

... When boys, Alf and Rusty had seen koalas (monkey bears) in the red gums along the Murray flood plain at Wodonga West. They had known men who shot them for their skins, from which they made rugs. Joe Ottey of Berringama, told me of catching Macquarie perch and Blackfish in the Berringama Creek from 1910 until about 1930 after which time brown trout, which had first appeared not long after World War I, took over completely.

I regret not knowing the name of the man I met at Tom Groggin Station, a Victorian property on the Indi River near Mt Kosciusko, who told me that he worked at Tom Groggin before he enlisted in the army and went to the first World War[1]. He had fished the Indi before he left and it carried a great number of bluenose, white eye and greasies. While he was at the war, he even dreamt about fishing the Indi. When he came home he returned to his old job at Tom Groggin and announced that before he did any work, he wanted to go fishing. Very quickly he caught a fish about a foot (30cm) in length, the like of which he had never seen before. So intrigued was he by this strange spotted but nicely shaped fish that he immediately took it to the homestead thinking it was something quite unique. At the homestead, he was told it was a brown trout.

From that time both the white eye and the blue nose numbers went into decline, while the number of brown and rainbow trout increased. To my mind, this man did do something remarkable, he had set a very positive time frame of a changeover of fish species in the Indi River.

1. The unidentified angler from Tom Groggin Station was Charlie Mildren. Charlie spent the latter years of his life at Tom Groggin but during the period around World War 1 was employed as a rabbit trapper at Brigenbrong Station immediately downstream from Tom Groggin. His descriptions of the fishing in the Indi River are likely to be for the Towong Upper/Biggara area.

OH 54
The Late Bert McKenzie of Ruffy was interviewed in July 1982 at an age of 82 years.
(From Trueman & Luker, 1992).
I fished the Murray from locks eight and nine right up to the bridge over the Indi River. A cousin and I went right up to the top of the Indi as far as we could get by road and we camped there. I had scrub worms and an eight pound breaking strain line and it was only the other side that stopped it. I would gradually work him back in. I had nearly half an hour on it when he was sliding along the top towards the boat and there was a twig sticking up and he felt it and woof he broke the line. It was a big cod, a Murray cod; he was deep and a green colour. I saw a couple of Trout cod that were caught up there that were about six to seven pounds. That was about 1948-50. I met a chap that had been up there, carted his boat along; and went spinning and they caught a lot around sixteen and seventeen pounds. They would go up to one big pool and put the boat and outboard in. Away they'd go spinning and they had quite a good haul of cod. That's hearsay of course but I think it was correct.

Footnote: Although Bert did not specify the precise location on the Indi River where he fished local knowledge sourced from Mr. Len Lebner of the roads in the area at the time suggests Bert fished in the Biggara or Bunroy areas. The highest bridge upstream was located at Biggara and reasonable gravel road access existed into the Bunroy area after World War Two.

OH 55
Roy Grant of Burrowye was interviewed in June 2006 at an age of 90 years.
I was born at a place called Linton, near Talmalmo. My father, George Grant, when he was young lived in Albury. He used to fish with a lantern, caught a lot of Catfish, that was around Doctors Point. Then we moved over to Burrowye, but on the NSW side of the river. The river in an ordinary season when I was young it would run a banker in spring, but in a flood it went all over the paddocks. There were a lot of logs in the river from the trees and lots of gravel, beaches of it with deep holes. At Burrowye my mother told me about the big flood in 1912, my brother Stan was born in 1920 and at that time there was the big drought. Smithick's lagoon went dry and she told me there were thousands of dead Catfish. That happened about when Stan was born, so it puts a date on it. I saw the last Catfish that was caught opposite the Burrowye cutting, on Bob Smithick's Talmalmo Station, in a big lagoon, about 3 pound I reckon, in a gill net. That was in 1935 and the last one I saw, actually the only one I saw up there.

In 1930 when we were going to school, over at Talmalmo School, we would grab a Stringybark sapling with a chord, hook and sinker and away we would go down to the river with a few worms. We would get two cod nearly every evening. Cod was what we caught most at Burrowye. There was a 45 pound cod caught by an uncle, Jordie Butt, at Linten on a Rabbit. We would get both types of cod, the Murray cod and what we called the rock cod which they now call a Trout cod. They were mostly called rock cod back in the 1930s though some people called them a Trout cod, never heard of them being called bluenose. The rock cod was darker and looked slimier, shiny looking. The heads were different, pointed in the rock cod, and the top lip was longer than the jaw. Sometimes they were nearly black, with little spots on them, but commonly a grey, maybe even blue, but definitely darker.

When I was a boy the rock cod was very common, even more common than the Murray cod. The rock cod were throughout the river, in the same places as the Murray cod, but sometimes in the faster water, very common at Burrowye. They were about the same to eat as the Murray cod. They were commonly caught around the 15 pound, but were caught well over 20 pound. They went right up the river and into the creeks; they were caught up through Corryong and Brigenbrong. They were very common in the Cudgewa Creek. I saw one rock cod caught out of the Cudgewa that weighed 45 pound; yes it definitely was a rock cod. The biggest rock cod I caught out of the river on a fishing rod was at the mouth of the Burrowye Creek, in about 1940, it went 53 pound. Well I had him tethered in the mouth of the creek for 3 days and he never stopped moving, just backwards and forwards, not like a Murray cod, they would just lay quiet. That was the biggest. My biggest Murray cod was 81 pound, but my brother Stan beat me, he got one that was 83.

By the late thirties we caught less rock cod, maybe the same number of both types. There was a professional fisherman, Tom Brown who had a camp at Thologolong and you could buy fish off him at anytime, he was all right. But there was a fishing party with Allan Brown and his brother Jack; they fished a lot of the cod out. The Browns came from Brown's Island near Albury and they stayed at Riverlea, at Fred Dick's camp at Riverlea. They used a special decoy made by a bloke, a chemist in Albury to lure the cod, mixed things, I know it had black tailed grubs in it, and it was deadly. They took out a heap of cod in 1936. In one trip they put 43 cod on a truck to Melbourne; there was a lot of rock cod in them. Allan Brown got bitten by a brown snake on that trip. The truck broke down and they all went rotten, they had to tip them out in the creek here. But they kept coming back and they were successful, I last saw them about 1939, that was the last of the big catches. They never really got over it the cod; we never saw the cod in those numbers again, though we still caught plenty for ourselves, but not those big catches. By the 1950s the rock cod had become scarce, less than ten percent of the cod were the rock cod or Trout cod. The last two Trout cod I caught weighed about 10 pound each and were taken on cicadas. That was about 1970 at Burrowye.

The white eye bream, I caught one in the Burrowye Creek, and I gave it to Jack Sutherland. Years before they were very common, caught up to 6 pound my father said, but I saw very few and really only remember catching that one. There were a few caught later and they were all gone by 1970. There were supposed to have been a few grunter in the river, but they disappeared by 1935, maybe earlier. Stan got one here in 1951; we didn't know what it was! The yellowbelly had never been a common fish in the area, though there were a few caught. Dad got one that was 23 pound. There were cod well up the Koetong Creek, as well as trout. Yes there was a lot of cod well up the Koetong Creek, Jingellic Creek and Horses Creek. In the Koetong they went up past Jim Star's place 3 or 4 mile up to about flat rock, they were mainly rock cod in there. Just below Bluff Road, in the Cudgewa Creek down from Cudgewa my mate threw in a little spinner, he yelled 'come quick, come quick!' he played it in. He thought it was the biggest trout, but it was an 18 pound Murray cod. The native spotted mountain trout, Stan and I used to catch them right up Harveys Creek, and in the Burrowye Creek.

About 1930, 32 I remember all the algae in the old weir, the ducks were spreading the algae everywhere. They put the bluestone in and it killed everything, all the fish in the weir. The bushfires killed a lot of fish. We found one 37 pound cod dying below Thologolong from the ash on a beach after the 39 fires. But the 52 fires were worse, there was an 81 pounder found dead at Kennedy's and Stan saw one lying on top of the water with its nose poking out, opposite the home. It was well over 100 pound, and he was saving the cod, getting the ash out of their gills. The 52 fire killed all the native mountain trout out of the creeks. After that all we caught in them were redfin and trout.

OH 56

Tom Jarvis of Tintaldra was interviewed in October 2006 at an age of 77 years.

My father had told me how he used to go and fish in the Jeremal and always, well mostly get 3 to 4 cod on a spinner. He grew up at Towong. I grew up around there, ended up down here (at Tintaldra). He always talked about when he was young how he used to catch a lot of Catfish. Always talking about them. Yes lots of Catfish around Towong. If he were still alive he would be 99. I've never seen one here, or the grunter. I used to fish with the school teacher, George Downing. I left school when I was 12, so that tells you how long ago that was. Any of the creeks up here, if there was a hole 6 foot deep there was cod in them. If there was a willow tree or logs you were sure to catch a cod in them. The Jeremal, Cudgewa, Corryong, they all had cod in them. The locals talked about all the cod and bream in the Mannus falls. I've caught cod up to 9 pound out of the Mannus. I've caught cod years ago all the way up the Swampy Plains, nearly to Khancoban. Up the top of the Murray I've caught cod at Biggara, in a big long hole. That's a long way up; you have a look on a map and see where that is! The cod here, well we thought there were three types. There was the normal Murray cod, the usual green colour. Then there was the "mud cod" which was similar but a lot fatter and stumpier, with a blunt nose. And there was the "rock cod". You could pick them in the water as they had big white edges on their tails. Lots of white. And the head, well the nose was longer than the other cods, darker and pointier. There was plenty of them here, hundreds. We used to get hundreds of the rock cod here, down at the reserve here in Tintaldra. They were caught up to 20 to 30 pound, bigger. I once saw a big one lying on a sugar bag, a rock cod.

The cod were common when I was a kid. Up to 20 pounds, some up to 60. I've got a photo from about 65 years ago when we caught 6 cod from 35 pound down to 8. All strung along a pole. Caught a lot of cod using a long cane rod, on an aeroplane spinner with the feather on it. We used to set springers, used the carp that came in different colours. The old carp. And yabbies. My best cod went 78 pound. We never really caught small cod, down to 3 to 4 pound, got one that size we threw back the day we got the six in the photo. No, didn't ever get the very small ones like they used to talk about. The slipperies, well they were something slippery, like an eel! We used to get a few small ones. I've seen the odd eel up here in the past too. The bream? Which one do you call the bream? Well the Macquarie perch. I've never caught many of them. Hardly ever, be a long time ago. I've caught plenty of redfin, going back 60 years. They've always been common, heaps of them, going back as far as I can remember.

When the snowy scheme came in, well the water was too cold, and got too cold too quick. The cod can handle the cold if given the chance. It needs to get warmer in summer. Look at where we used to catch them! And the snags, well they pulled them out for the Snowy scheme, now they want to put them back in! When the water got cold, the trout, well that was nearly all you could catch. I used to catch a lot of trout on the spinners. Then the carp came in. The water used to be clean here. I've been on this property for fifty years. Now the water is dirty, you have to boil it to drink it. Never had to do that in the past. Some blamed the dams for the dirt, but that didn't happen. The water went dirty after the carp. Hume, well that became a breeding ground for the cormorants and pelicans. It's not natural to have them like that. At Granya, I used to watch the cormorants driving the fish. The pelicans would follow and clean up the big fish that the cormorants couldn't finish off. They would be fighting over them.

OH 57

Betty Walton of Tintaldra was interviewed in September 2006.

The late Jack Smerdon passed away in 1998. He was the local expert on the fish here. Spent time in Changi during the war. He could go a long way back, to the twenties. He often talked about catching the Trout cod in the Murray and the creeks upstream around Towong, prior to World War 2. He said they were prevalent, and could be reliably caught under the wattle trees, that's where the birds used to be. His theory was that the trees or the bird droppings attracted them. Jack told me that the normal Murray cod were more often caught further down the river, but are found further up near here today. Jack said that the Trout cod were prevalent up past here where the water was faster, Towong and further up, that they were a lot smaller than the normal Murray cod. He talked about how the Trout cod used to be so common up here, then disappeared. He could have told you all about them.

OH 58

Jim McGinnity of Tooma was interviewed in November 2006 at an age of 70 years.

For most of my life in the Tooma River there has been mainly trout and redfin. I'm on the Mannus Creek, and my grandfather's house is further down the creek. Going back to the 30s and 40s in the creek were trout, redfin, bream and the odd cod. In the early days my grandfather used to go cod fishing in the creek all the time, there was plenty of them. He caught one that was 60 pound, out of the Mannus. The cod and bream were common in amongst the falls between here and Tumbarumba and they went right up above the falls. I can remember catching the odd bream in the Mannus from Tooma back up into the hills. They weren't big bream, and I believe there is still the odd one caught further up. My father had said originally that there had been the odd yellowbelly in the creek too. There used to be beautiful trout fishing here, though it slackened off about 20 years ago. There is still the odd cod about 4 pound.

OH 59

Ken Nankervis, formerly of Tom Groggin Station, was interviewed in June 2006.

Cod were common in the upper Murray and it was widely known that the Trout cod was also caught. The cod were generally caught downstream of Tom Groggin, I'd say it was too cold for them further upstream. They were common in the Cudgewa Creek, some are still caught. After the Snowy Mountains Scheme the water became too cold and the Murray was desnagged to help the flow. The cod pretty well declined. I remember Charlie Mildren; he used to tell this story about how he caught the first brown trout from the river and took it up to the homestead to be identified. That wasn't at Tom Groggin, he was up there later. He worked at Brigenbrong back then. He told me the river used to be full of perch (Macquarie) as well as cod. In the Nariel creek he used to light a fire to attract the perch and could net them from the bank.

OH 60

Len Lebner of Corryong was interviewed in December 2006 at an age of 80 years.

I was born in 1927, so I am nearly 80. I grew up in Corryong; we had a property at Upper Towong. My father, when they were boys in the early 1900s, well they leased a bit of land there. They were off to do some fishing and they thought they would check their drum net. It was a homemade job, not real strong. When they pulled it out there were 2 cod in it, one was 20 pound and the other about 4 pound. They put it back in the river to keep the cod alive. When they dragged it back out on the Saturday the little cod was gone. They thought, well the drum net was not well made and so it must have worked out how to escape. When they cleaned the big cod they found the little one in it!

Dad told me that when they were boys, in the evenings, you could catch heaps of little cod, 6 to 8 inches long. Two or three or four of the boys would be fishing and the little cod were very plentiful. But from 1935 on it was unusual to catch the small cod, I never caught many, caught 3 to 4 pounders, but not many of the small ones. Back then you were aware there were the two types of cod, with the thinner ones in the moving water. But we

never took much notice; they were all cod to us. There was an old fellow that lived next to us, Aussie Rickson, a stockman; he told us how he used to catch the cod at Bunroy, that's up past Biggara. He used to go out there helping 'Lightwood' Bill Pendergast on a grazing lease and he would go fishing on his way home on Saturday afternoon. They used a stringybark pole with a spinner which they used to leave hidden in the trees. The cod he told me weren't very big, up to 10 to 12 pound, but he got plenty of them. He lived at Biggara then with his parents, that was well before 1927, probably before the First World War when they were doing that.

Dad used to catch the Catfish out of the lagoons, he said once to me 'I wonder if there are any of them left in the lagoon? I used to stand on the bank and you could see the nest, where there was a slow flow, where the water came into it, out at Towong Hill'. But I've never caught one. Frank Anderson told me that the Catfish used to be quite common in the backwaters at Khancoban Station, he was there before the first world war, they later had the post office at Khancoban. When we were kids we could catch the redfin by the thousands, you would get sick of catching the things. The biggest 6 inches, down to 2 inches. In the Thowgla Creek, down near the junction of they Corryong Creek. One day I caught a Macquarie perch, about a pound, in amongst those things.

The perch, the Macquarie perch, we used to catch a few in the early 1930s, but we caught more cod than perch. My father said he would go down in the evening off a sandbank and with worms you could catch a sugarbag full. In the earlier days, up to the twenties, they were common in all the creeks around here. Bob Whitehead of Lighthouse told me he was once riding along the river bank and in the shallows on a beach he found a drum net. It was a seething mass of perch, he couldn't lift the net so he dragged it out, rolled it onto the shore. It was half full of perch! He took some home and to the hospital, the rest I think he let go. That was in the Murray at Lighthouse. They were much less common when I was a boy, nowhere near as common as the old bloke said they used to be. I reckon back then one 2 to 2 ½ pound was a good one. I saw two caught up at Bunroy about 1980, one of the girls that went with us caught two, out of a backwater. They were the first I had seen in a long time.

The greasies were common everywhere, even in the mountain creeks. You would catch them towards sundown. I was told there was an occasional Golden perch caught, not many, possibly up to the 1930s. I think the Cudgewa Creek was the best cod creek, and the Corryong Creek. We caught cod out of the Thowgla but it was not so good as it is only a small creek. There was a father and two sons down Granya way named Brown, he was a pro fisherman. This young fellow, one of the sons, told me if you wanted nice fish you could get 4 pound cod in the Koetong Creek, that they were beautiful fish out of there.

We used to go out fishing on the farm in the evenings; we would put a dozen set lines in. In the 1940s you would always get four cod, up to about 12 pound. Later I caught a 50 pounder in the same area, that was my biggest, though I got plenty around 20 to 30 pound. For the cod we used to use the yabbies and the old carp, and the aeroplane spinner. Sometimes we used worms. Parrot was a favourite. I remember catching one on half a parrot, that was 4 pound, in the fast water at Tintaldra. I think that was a Trout cod. Old George Lloyd told me that in the old days that the best time to catch cod was when the wattles were flowering, but that was the closed season. The cod are coming back, particularly in the Cudgewa Creek; they are catching quite a few.

11 Kiewa River Catchment

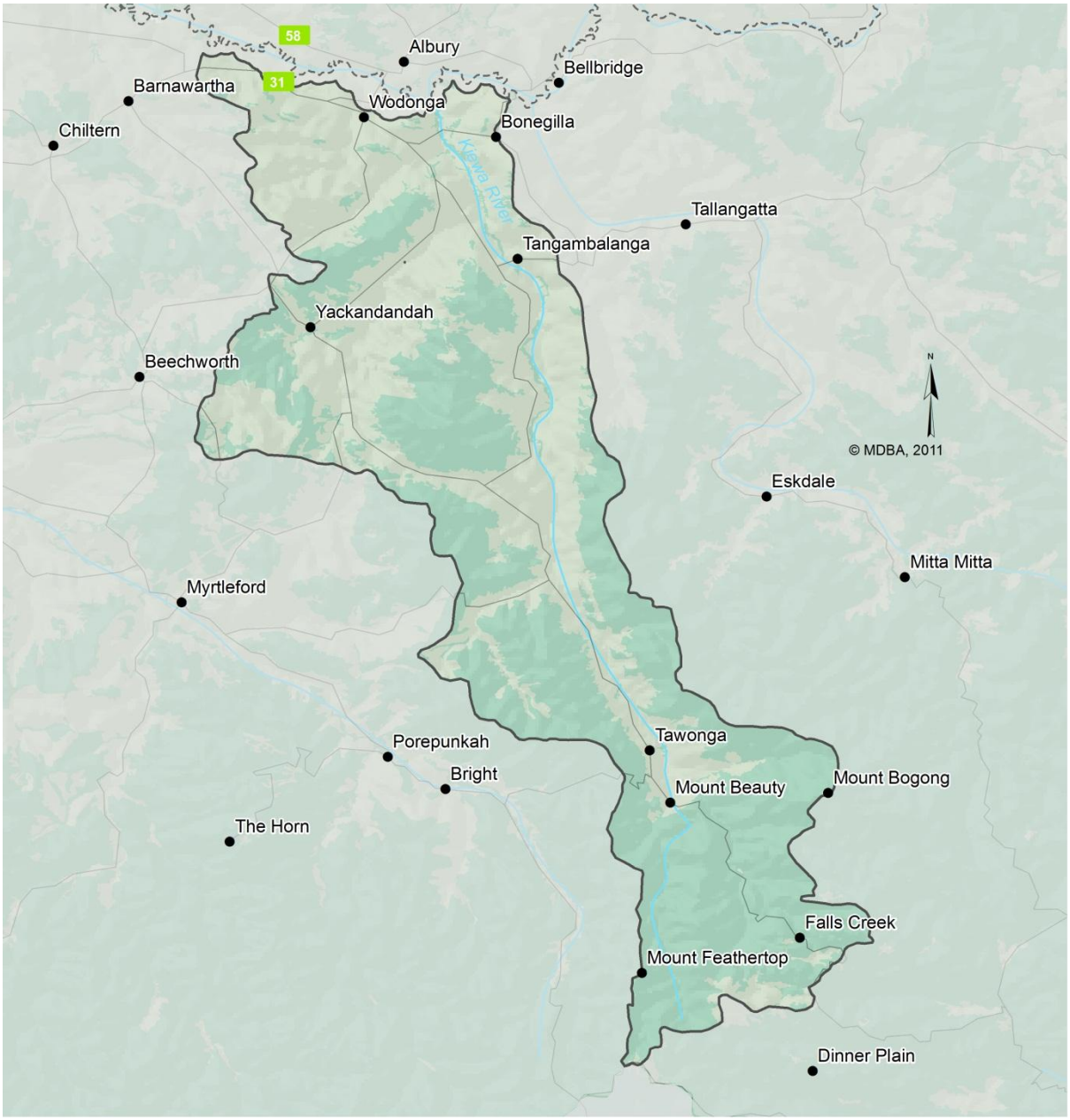
BRIGHT.—A party of anglers from Bright, including Messrs. O. V. Briner, E. Harwood, J. Hepburn, and M. J. Dowling, had a very successul trip to the Kiewa River at Gundowring during the week, securing about 100lb. in weight, and bringing 80lb. back to Bright. The catch included a 26lb. cod, which attacked a 3lb. perch that had been tethered by Mr. Briner during Saturday. The cod had almost swallowed the perch when found, and was secured by the hand being placed in its gills before the fish realised that it was a captive. Mr. Briner also secured an 8½lb. cod and a nice lot of perch, averaging 2lb. Mr. Harwood captured a cod 11½lb. and a cod 3½lb., besides several perch. Mr. Hepburn got some good perch, whilst Mr. Dowling had good sport amongst the fry fish. A dozen perch were brought to Bright, which averaged over 2lb. each.

Argus, 13 March 1903

BRIGHT. – A party of anglers from Bright, including Messrs. O. V. Briner, E. Harwood, J. Hepburn, and M. J. Dowling had a very successful trip to the Kiewa River at Gundowring during the week, securing about 100lb. weight, and bringing 80lb. back to Bright. The catch included a 26lb. cod, which attacked a 3lb. perch that had been tethered by Mr. Briner during Saturday. The cod had almost swallowed the perch when found, and was secured by the hand being placed in the gills before the fish realised that it was captive. Mr. Briner also secured an 8½ lb. cod and a nice lot of perch averaging 2lb. Mr. Harwood captured a cod 11½lb. and a cod 3½lb., besides several perch. Mr. Hepburn got some good perch, whilst Mr. Dowling had good sport amongst the fry fish. A dozen perch were brought to Bright, which averaged over 2lb. each.

Argus, 13 March 1903

Figure 11.1 The Kiewa River Catchment showing major waterways and key localities.



11.1 Early European Accounts

Hamilton Hume and William Hovell explored the lower reaches of the Kiewa River in November 1824, Hovell recording the capture of fish from the river: 'In the river, they caught some of the Lachlan codfish, and in the ponds, a kind of fish, similar to carp' (Bland, 1931). In the early years of European settlement the Kiewa was known as the Little River, which was replaced by an aboriginal word 'kiewa' meaning 'sweet water' (Andrews, 1920). There was also one account, originating from one of the first white settlers that reported 'kiewa' to mean 'ever flowing' (*Argus,* 8 April 1882).

Apart from Hovell's account, very few early references to native fish in the Kiewa Catchment have been published. A few newspaper articles describe some catches, and from these it is clear that the Kiewa originally contained an abundance of fish. In 1903 a group of anglers 'had a very successful trip to the Kiewa River at Gundowring during the week, securing about 100lb. weight, and bringing 80lb. back to Bright. The catch included a 26lb. cod, which attacked a 3lb. perch that had been tethered' (*Argus*, 13 March 1903). John Langtry in 1948 noted the presence of Blackfish in the Kiewa River but, despite the fact that the habitat appeared good, that 'cod, callop and bream' were captured 'only on rare occasions' (Cadwallader, 1977).

Victorian Fisheries and Game Department Inspector J. O. (Jack) Rhodes published a brief account, sourced from the McFarlane brothers of Wodonga who fished the Kiewa River from 1928 until the 1940s, recording that 'they enjoyed magnificent fishing in the Kiewa River on white eye and blue nose'. He also recorded the presence of Murray cod and Blackfish in the Kiewa River and how the 1939 bushfires decimated the native fish population (Rhodes, 1999). Jack Rhodes has kindly provided permission for the McFarlane's account to be reproduced (OH 94).

11.2 The Past Distribution of Fishes in the Kiewa River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the Kiewa Catchment into a lowland zone (downstream from Kergunyah), a slopes zone (upstream to Mount Beauty), a short upland zone (upstream to Bogong) and a montane zone beyond the latter location. The physical form of the Kiewa River downstream of Kergunyah to the Murray River is confined by a valley with a relatively narrow floodplain containing extensive areas of gravel and sand substrates. Effectively, true lowland habitat does not exist in the Kiewa Catchment, and the slopes zone is treated here as extending to the Murray River. All other habitat zones match those in the *Sustainable Rivers Audit.*

The information presented below is sourced from limited oral history dating back to the late 1920s and a few newspaper accounts. No historical photographs of catches of native fish in this catchment have been located.

11.2.1 The Montane & Upland Zones

There are no historical accounts recording the past existence of large native fish in the montane and upland zones of the Kiewa Catchment. Blackfish today are present and common in some upland streams in the catchment, but it appears that the steep gradients of the East and West Branches of the Kiewa River upstream of Mount Beauty prevented access of the other large native fish species into these zones.

11.2.2 The Slopes Zone

Newspaper accounts record that cod were very common to abundant in the slopes zone of the Kiewa River, with large numbers of juvenile fish present in some areas (*Argus*, 13 March 1903; *Argus*, 11 July 1922; *Argus*, 22 February 1939). The McFarlane brothers' account of their catches from the Kiewa River between Tawonga and Dederang indicates that the main species captured were Macquarie perch, Trout cod and Blackfish, with lesser numbers of Murray cod being taken (McFarlane, OH 94). The brothers were very familiar with Trout cod and provided a detailed description to Jack Rhodes, leaving no doubt about the identity of the fish. The catches of Trout cod were consistent and at times large (Jack Rhodes, pers. com.) suggesting that the species was very common to abundant. The account is supported by additional oral history from 95 year old Myrtleford resident Walter Grattidge, the oldest surviving witness, who fished the Dederang area. He indicated that most of the cod taken were Trout cod and they were abundant. He stated that the river had a 'power of fish in it' (Grattidge, OH 97).

The McFarlane brothers caught relatively small numbers of Murray cod from the Kiewa River and were surprised at seeing more Murray cod than expected, including some large specimens, dead after the bushfires (McFarlane, OH 94). They indicated that a lot more Trout cod than Murray cod were observed in the kill (Jack Rhodes, pers. com.) but from their observations Murray cod were fairly common. Cod had been common upstream of Tawonga (Murphy, OH 95) and one Wodonga resident has recalled capturing both Trout cod and Macquarie perch in the lower reaches of the west branch of the Kiewa River near Mount Beauty (Simon Kaminskas, pers. com.).

Macquarie perch were abundant in the Kiewa River, with some large catches being taken (McFarlane, OH 94; Jack Rhodes, pers. com.). A news story described several catches of perch averaging two lb. (0.9 kg) near Gundowring (*Argus*, 13 March1903) and another reported that a hole in the Kiewa near Springvale (between Kergunyah & Kiewa) being 'full of small perch' and that they were 'as thick as flies' with larger fish up to 2½ lb. (1.1 kg) being taken (*Argus*, 11 July 1922). The perch were also common in anabranches and lagoons adjacent to the river in the same area (*Argus*, 26 October1928). The newspaper accounts do not provide a definitive identification of the type of perch but the evidence from the oral history indicates that they were Macquarie perch.

Oral history records that Catfish had been present during the 1930s in the Kiewa River near Kergunyah and Kiewa (Murphy, OH 95; Neville Hadley, pers. com.). The oral history is validated by two newspaper accounts, which described the presence of Catfish in the Kiewa River itself, near Springvale, and large numbers of juveniles in creeks and anabranches adjacent to it (*Argus,* 11 July 1922; 26 October 1928). Catfish were abundant in lagoons near the junction of the Murray and Mitta Mitta Rivers (*Argus*, 16 February 1912) suggesting that a similar situation would have existed in the lower Kiewa. Blackfish were very common in the Kiewa River, lagoons and creeks including the Bells Creek and Running Creek (McFarlane, OH 94; Murphy, OH 95; Grattidge, 97; *Argus*, 26 October 1928). Langtry suggested that 'callop' (= Golden perch) and 'bream' were present in Kiewa River (Cadwallader, 1977) but other historical information does not specifically record the presence of Golden perch or Silver perch. Both species were fairly common near Albury (McFarlane, OH 53) and there are accounts of both being present in the lower reaches of the nearby Mitta Mitta River (*Argus*, 4 July 1924; Moyle, OH 93). It can be inferred that both Silver perch and Golden perch were probably present in the slopes zone of the Kiewa River in small numbers.

11.2.3 Estimates of Native Fish Abundance in the Kiewa River Catchment at European Settlement.

Presented are the rarity scores used in the Sustainable Rivers Audit (Davies *et al.*, 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 11.1 Kiewa River Catchment Rarity Scores (Main River Channels)

	Slopes* (Murray River to Mount Beauty)		**Upland** (Mount Beauty to Bogong)		**Montane** (Upstream of Bogong)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod	3	L5	0	0	0	0
Murray cod	3	L3	0	0	0	0
Golden perch	3/1 †	1?	0	0	0	0
Silver perch	1/0 †	1?	0	0	0	0
Macquarie perch	3	**5**	0	0	0	0
Catfish	0	**L3**	0	0	0	0
'Blackfish'	3	**U3**	3	?	0	0

Key
0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type are supported by multiple accounts or lines of evidence e.g. oral history, newspaper accounts, photographs.

* Note: The boundaries used for this zone differ slightly from those used in the *Sustainable Rivers Audit*

† Note. The *Sustainable Rivers Audit* identified the existence of a lowland zone which has been treated here as part of the slopes zone. Different rarity scores were provided for Golden Perch and Silver Perch in the lowland and slopes zones of the Kiewa Catchment. Both are provided with the lowland score listed first.

Figure 11.2 Historical Records for Murray cod and Trout cod in the Kiewa River Catchment

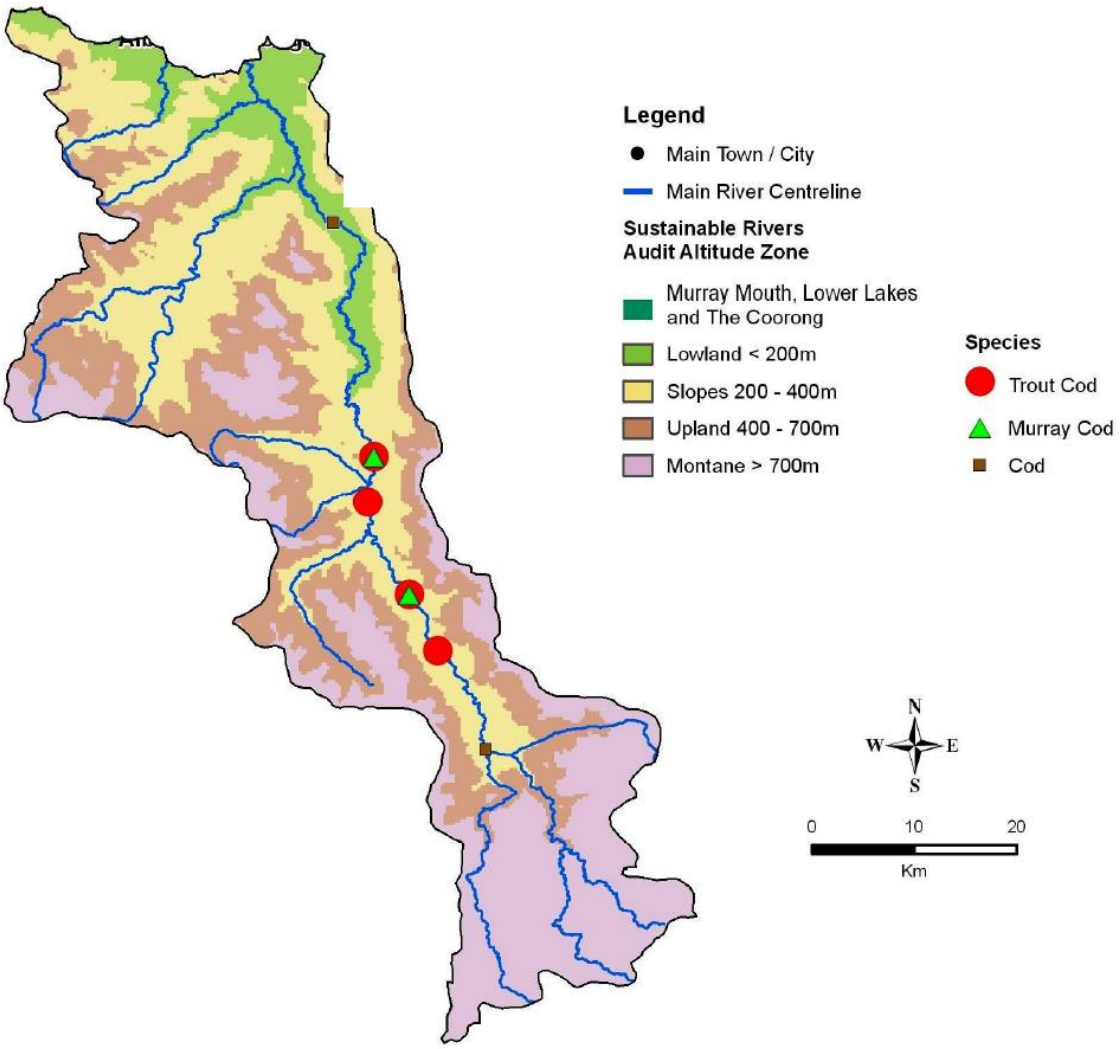
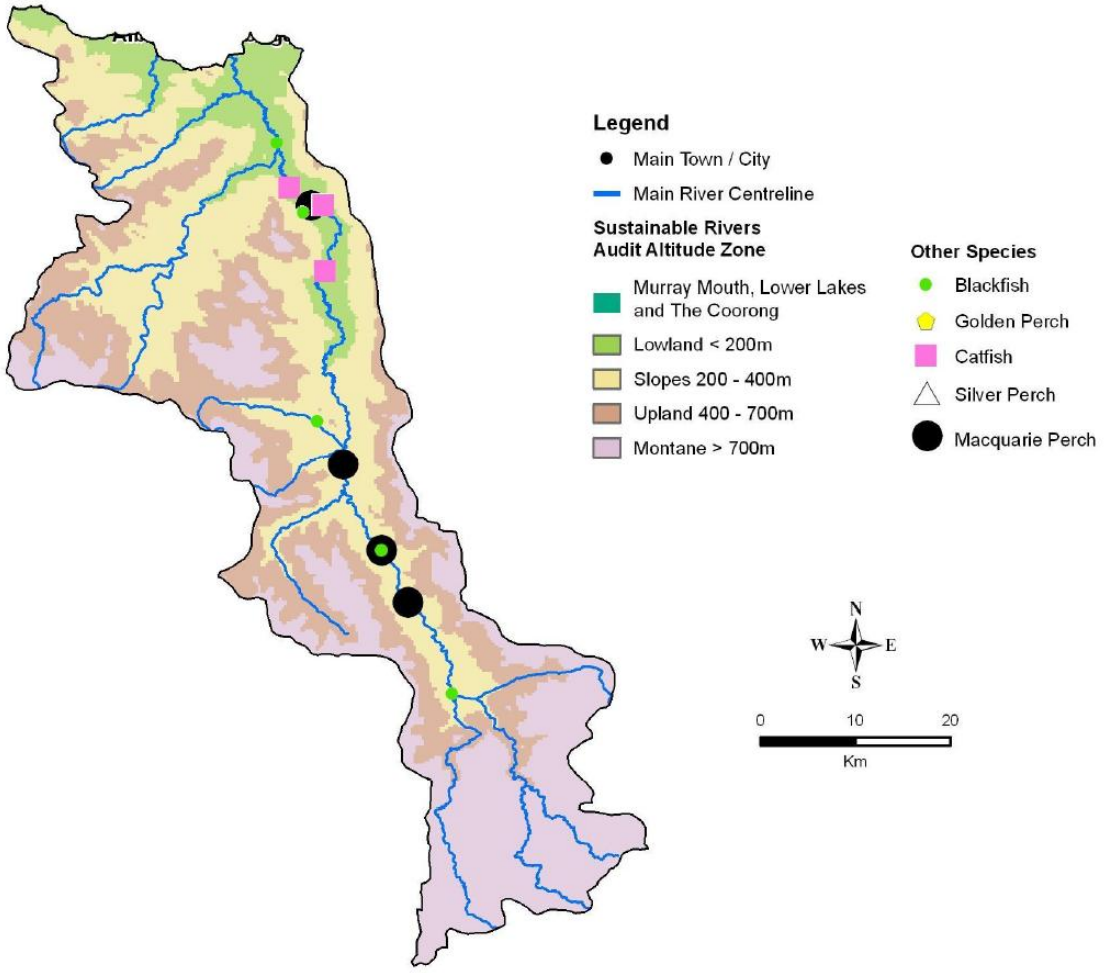


Figure 11.3 Historical Records for Native Fish Species other than Cod in the Kiewa River Catchment



11.3 The Changes

11.3.1 Changes to Native Fish Distribution and Abundance

Native fish were abundant in the slopes zone of the Kiewa River until February 1939, when a bushfire event initiated a massive fish kill. After that time Trout cod, Macquarie perch and Catfish were not reported, though Blackfish populations recovered. There was also some recovery of Murray cod in the lower reaches (McFarlane, OH 94; Murphy, OH 95; Grattidge, OH 97; *Argus*, 22 February 1939).

11.3.2 Changes to Habitat

In the early 1850s gold was discovered in the Yackandandah Creek and, in subsequent decades, extensive alluvial workings occurred at Allan's and Osbourne's Flats. Hydraulic sluicing commenced in the 1880s followed by bucket dredging in 1905. In 1870 massive floods washed away much of the disturbed alluvium downstream into the Kiewa River (Flett, 1979). The mining operations in the Kiewa and Mitta Mitta Catchments are reported to have impacted on water quality in the Murray River as far downstream as Corowa (NSW Fisheries Report, 1907). The February 1939 bushfire produced a transient 'blackwater' event which caused an enormous fish kill (McFarlane, OH 94; *Argus*, 22 February 1939). Subsequent to the fire increased silting of the Kiewa River occurred (Bill Murphy, pers. com.).

Brown and Rainbow trout were introduced to the upper Kiewa River prior to the First World War and a volunteer hatchery operated, regularly stocking waters in the catchment (Clements, 1988). After the 1939 bushfire trout colonised much of the slopes zone of the Kiewa River and became abundant (McFarlane, OH, 94). Goldfish were first reported from this catchment in 1919 when shoals were said to be present in some lagoons (*Argus,* 16 September 1919). No precise date has been identified for the arrival of Redfin perch in the Kiewa River, though the species is reported to have been common at Albury by 1921 (NSW Fisheries Report, 1921) and were probably present in the Kiewa River at that time. They were abundant in the Kergunyah area by the 1940s but became scarce after large fish kills, attributed to a disease occurred in the 1980s (Murphy, OH 95). European carp became common during the 1980s (Bill Murphy, pers. com.).

During the 1950s construction commenced on the Kiewa Hydroelectric Scheme. In conjunction with the scheme, extensive snag removal occurred (Murtagh, OH 85). Operation of the dams has altered the natural flow regime of the Kiewa River and water temperatures have been reduced downstream (Ryan *et al.,* 2001).

11.4 The Current Situation

The *Sustainable Rivers Audit* concluded that:

> the Kiewa Valley fish community was in Very Poor Condition. The Lowland, Slopes and Upland Zone communities were in Very Poor, Poor and Extremely Poor Condition, respectively. Alien species were 90% of total biomass and 57% of total abundance. The community had lost most of its native species richness and was dominated by alien fish (Davies *et al.,* 2008).

Today Blackfish are fairly common in some tributaries of the Kiewa River. A good population of Murray cod exists in the lower reaches, with some fish being taken as far upstream as Mongans Bridge. While a natural population of cod existed in the river it has been supported by extensive stocking. Some Golden perch have also been stocked with small numbers being taken by anglers. Macquarie perch, Silver perch and Catfish are

extinct in the catchment and, until recently, Trout cod were also absent. Recent captures of Trout cod have occurred, with the fish probably making their way into the Kiewa from the Murray River. A large sand slug in the lower reaches is an obstacle inhibiting native fish movement upstream in the river. While a fairly good Murray cod fishery now exists in the lower reaches there is no longer 'magnificent fishing in the Kiewa River on white eye and bluenose' (Rhodes, 1999).

11.5 Newspaper Highlights

Argus, 13 March 1903

Country News. / Bright:- A party of anglers from Bright, including Messrs. O. V. Briner, E. Harwood, J. Hepburn, and M. J. Dowling had a very successful trip to the Kiewa River at Gundowring during the week, securing about 100lb. weight, and bringing 80lb. back to Bright. The catch included a 26lb. cod, which attacked a 3lb. perch that had been tethered by Mr. Briner during Saturday. The cod had almost swallowed the perch when found, and was secured by the hand being placed in the gills before the fish realised that it was captive. Mr. Briner also secured an 8½ lb. cod and a nice lot of perch averaging 2lb. Mr. Harwood captured a cod 11½lb. and a cod 3½lb., besides several perch. Mr. Hepburn got some good perch, whilst Mr. Dowling had good sport amongst the fry fish. A dozen perch were brought to Bright, which averaged over 2lb. each.

Argus, 11 July 1922

Perch In The Kiewa. I am not certain to what particular perch S. Clapham refers as being plentiful in the Kiewa River. He says that his daughter persuaded him to go up the river to have a try for catfish, which were to him a novelty. The Kiewa has a good flow for part of the year, but in summer is merely a succession of waterholes. In one of these, which was about two chains long, 8ft. deep, and thickly bordered on one side with bullrushes they had a try and found that the pool was full of small perch about 3in. long and they were around the worm bait as thick as flies. Later in the evening they caught perch up to 2¼lb. weight.

Argus, 26 October 1928

Where Cod Spawn. Mr. S. Clapham mentions experiences on the Kiewa River, in the north-east, which lead him to believe that Murray cod spawn in still water. He sometimes went to lagoons when they were nearly dry to get crayfish for bait, and entangled with the weed brought up in the band net were always numbers of small cod, perch, and blackfish about an inch long. He could have got hundreds of these if he wishes. From the Kiewa River there is a creek which runs swiftly when the river rises, but in summer is only a chain of deep holes. In these small catfish, perch, and blackfish are got, but never cod.

Argus, 22 February 1939

Many Codfish Die. Yackandandah, Tuesday. Ashes and other rubbish washed by rain from the fire burnt ranges into the Kiewa River have been responsible for high mortality among fish. Mr. W. Keat of Gundowring discovered seven dead cod fish totalling in weight more than 100lb. Other landholders abutting the Kiewa River report similar mortalities.

11.6 Kiewa River Catchment Oral Histories

The following oral histories (OH 94-95) discuss the Kiewa Catchment.

OH 94

Jack Rhodes has kindly provided permission for these paragraphs from his book (Rhodes, 1999) to be re-published. Included are oral history provided by Alf and Erskine McFarlane of Wodonga West of the Kiewa River

However, from 1928 when Alf bought a Chevrolet truck, they enjoyed magnificent fishing in the Kiewa River on white eye and blue nose, mainly at Indians Hole near Red Bank and Keegans and Mongans bridges. In 1939 after bushfires in the Kiewa River catchment, heavy rains brought ash into the river and many fish of all species died. Noticeable in the mortalities was a larger number of both spiny crayfish and Murray cod than had been thought to exist in the river. From that time in the Kiewa River the small northern Blackfish (greasies) recovered in number, but the only other native fish ever caught there by Alf and Rusty was a small number of Murray cod. The white eye and blue nose were gone, and the river became noted for the excellence of its brown and rainbow trout.

OH 95

Bill Murphy of Kergunyah was interviewed in April 2008 at an age of 73 years.

I was born in '35. I remember my uncle went down here and all the lobsters were in the back of the Ford. I saw the lobsters; they were coming out of the river after the fires. He was fishing down here and there was a 70 pound cod dead, down near Doug Austin's. Cliff Cooper told me there was cod all the way up past Tawonga before the fires. Apparently there was a few about 90 pound caught around here. There was an old bridge just below my boundary; there was a 90 pounder there. There used to be a few Catfish here, my father used to catch them in 'the old river', where it cuts through the paddock. He also talked about getting some other type of fish there. The Blackfish were in the little creeks, some people used to get a feed of them. There used to be some in the Bells Creek and the Running Creek. There were no yellowbelly here, not as I remember, and grunter, no.

When I left school the river was full of trout, you could catch them on worms up to 11 pound, then they started to disappear. The redfin then used to be thick, then they disappeared with a fish disease. I saw them dying in the river about 25, 30 years ago. I haven't caught a carp for two to three years. I once saw six about 10 pound each eating the leaves off the willows. Now the river is full of small cod, though they get a bit of a hiding. Felix Carmody was a character and a well-known poacher, he used to get a few ducks. He used to catch black snakes and once he tipped one out in the pub, that soon cleared the bar!

12 Ovens River Catchment

"We have heard a good deal," says the *Ovens Spectator*, "of the extraordinary number of fish taken out of the Ovens River by the baskets of Mr. Henley's wheel at Oxley, which he uses for lifting water for irrigation purposes. On a recent visit to Mr. Henley's, we witnessed the curious process—one never contemplated by the proprietor, speculative as he is. The buckets are rather deep, and as the fish endeavour to make up the river, they get into them as they pass, evidently to escape the force of the down current, and are thus lifted and emptied with the water into the flume. Large and small keep constantly turning up, and of all kinds, but they generally come in shoals, and we ourselves witnessed within half-an-hour some two dozen fish, chiefly bream, weighing from a few ounces to three and four pounds each. The small ones are of course returned to the river, but we believe at least a hundredweight of saleable fish in the 24 hours is the rule and not the exception. From the flume and race the fish are lifted by a net, and deposited in an artificial pond through which water is constantly running, and here they are also netted as required, and sold in the same condition as if then and there taken out of the river. In connexion with this we have a curious snake story. On first approaching the flume with Mr. Henley, we observed a great commotion amongst the fish just raised, which was difficult to account for. Presently a tiger snake put his head out, and was crawling up the bank when Mr. Henley killed it with the hoop of the net which he had in his hand. We did not think at the moment of opening him, but we have no doubt he was having a meal of the small fry."

Argus, 25 January 1871

"We have heard a good deal," says the Ovens Spectator, "of the extraordinary numbers of fish taken out of the Ovens River by the baskets of Mr. Henley's wheel at Oxley, which he uses for lifting later for irrigation purposes. On a recent visit to Mr. Henley's, we witnessed the curious process – one never contemplated by the proprietor, speculative as he is. The buckets are rather deep, and as the fish endeavour to make up the river, they get into them as they pass, evidently to escape the force of the down current, and are thus lifted and emptied with the water into the flume. Large and small keep constantly turning up, and of all kinds, but they generally come in shoals, and we ourselves witnessed in half-an-hour some two dozen fish, chiefly bream, weighing from a few ounces to three and four pounds each. The small ones are of course returned to the river, but believe at least a hundred weight of saleable fish in the 24 hours is the rule and not the exception. From the flume and race the fish are lifted by a net, and deposited in an artificial pond through which water is constantly running, and here they are also netted as required, and sold in the same condition as if then and there taken out of the river. In connexion with this we have a curious snake story. On first approaching the flume with Mr. Henley, we observed a great commotion amongst the fish just raised which was difficult to account for. Presently a tiger snake put his head out, and was crawling up the bank when Mr. Henley killed it with the hoop of the net which he had in his hand. We did not think at the moment of opening him, but we have no doubt he was having a meal of the small fry".

Argus, 25 January 1871

Figure 12.1 The Ovens River Catchment showing major waterways and key localities.

12.1 Early European Accounts

Hume and Hovell on the 24th of November, 1824 encountered a modest river near the present locality of Boorhaman. They named this the Ovens, after Major John Ovens the late private secretary of Governor Brisbane. On the return leg of their journey, on the 31st of December, they recorded catching an abundance of fish from the Ovens River but provided no details to identify the species (Bland, 1831). A cattle station named 'Wangaratta', reputedly meaning the place where cormorants nested, was established by 1838 on the Ovens River by George Faithful (Whittaker, 1963), and other settlers soon followed. At the beginning of 1852 there was a relatively low population in the region, but this changed with the discovery of gold at Spring Creek where Beechworth now stands. By the end of that year, 8,000 miners were at work on the Spring and Reids Creeks, and within a decade 30,000 miners were in the region, resulting in Beechworth becoming the capital of north eastern Victoria (Flett, 1979). Further gold rushes occurred at El Dorado, Buckland Valley, Morses Creek (Bright) and Harrietville, with numerous smaller workings in the catchment.

Henry Morgan migrated to the Buckland Valley to seek his fortune as a gold miner. He became a permanent resident of the area and notable road builder. His journal between 1858 and 1867 contains numerous references to the success of his angling activities in the Buckland River, a typical comment being: 'went fishing and caught a good mess for supper' (Morgan, 1908). He also fished other waters including the Mannus Creek near Tumbarumba, and the Buffalo and Big Rivers. Although he usually did not identify the type of fish caught, he twice recorded catching Blackfish, with other larger fish not named. The Reverend Daniel Draper visited north east Victoria during October 1863, travelling through Beechworth, Yackandandah, Morses Creek and Myrtleford. While passing through the upper Ovens Valley his party was served cod from the local hotel: 'We all – Dr. Hutchinson, Mr. Witt, and myself – stopped at a wayside hotel, "Porepunkah," for shelter. Had fine fish for supper, cod from the Ovens river' (Symons, 1870). Given his reported lack of transport in the region at that time, the cod were most likely taken from the Ovens River at the rear of the pub in Porepunkah. In 1908, naturalist C. F. Cole observed that Catfish were present in permanent billabongs in the Bright area as well as 'shoals of small perch of different species' amongst the aquatic vegetation on the banks of the river itself (Cole, 1908).

Early newspapers described an abundance of fish in local rivers. One account reported that a water wheel set up on the Ovens River near Oxley, was capturing large numbers of fish which swam accidentally into its buckets:

> The buckets are rather deep, and as the fish endeavour to make it up the river, they get into them as they pass, evidently to escape the force of the down current, and are thus lifted and emptied with the water into the flume. Large and small keep constantly turning up, and of all kinds, but they generally come in shoals, and we ourselves witnessed in half-an-hour some two dozen fish, chiefly bream, weighing from a few ounces to three and four pounds each. The small ones are of course returned to the river, but believe at least a hundred weight of saleable fish in the 24 hours is the rule and not the exception (*Argus*, 25 January 1871).

Lagoons near the King River contained numbers of Catfish (*Argus*, 26 December 1917), while further upstream the Buffalo River was reported to contain 'voracious Murray cod and perch' (*Argus*, 16 August 1884). An unusual visitor to the Ovens River was a seal which was captured near Peechelba. Another was reported as residing at Lake Moodemere near the Murray River (*Argus,* 8 May 1865).

As the gold rush subsided, Beechworth's fortunes waned but it remained an important centre. A disused quarry on the edge of the town was proposed by council to be converted into an ornamental and recreational

lake. In the 1920's Beechworth won the 'Ideal Town Competition' two years running for a total prize of £400, and the funds were put towards building a dam to form a lake. It was completed in 1928 and named in honour of the man who oversaw the project, Mr. L. H. Sambell, President of the Beechworth Promotional Council. Part of the vision for Lake Sambell was the creation of a recreational fishery. A permit was obtained to capture juvenile 'cod' and 'bream' from the Ovens River and relocate them to the lake in the hope that they might breed and provide fishing (*Ovens and Murray Advertiser,* 28 April 1928; Iris Mannik, pers. com.).

The *Ovens and Murray Advertiser* of 28 April 1928 reported planning to 'make arrangements for stocking the new lake with Macquarie perch and Murray cod from Ovens River' and that 'a number of volunteers have agreed to visit Everton at the week end to angle for the necessary number'. The same paper subsequently reported that:

> About 70 fish had been caught in the Ovens River and set free in the lake the previous night, and more that afternoon. The men were going fishing again and probably 200 or 300 bream and cod would be put in the lake which would be closed against fishing for 12 or 18 months. He also warned anyone who dumped redfins into this lake that they would be dumped in themselves (*Ovens and Murray Advertiser,* 2 May 1928).

The paper also published a notice for a meeting to be held on May 4 1928 to form an Angler's club, and 'to organize in regard to the stocking of the new lake with Murray cod and Macquarie perch'. The Macquarie perch failed to thrive in the lake, but the cod did, and Lake Sambell became noted as one of only two essentially land-locked artificial lakes in Victoria that supported a cod fishery (Cadwallader, 1977).

While the Ovens River had not been subject to commercial fishing since the 1890s, Colonel John Langtry recorded some information and a few observations on the Ovens River district in 1948 as part of his survey of the inland fishery (Cadwallader, 1977). This included the results of drum netting carried out in the Ovens River by Victorian Fisheries and Game Department Inspector Clarrie Howe. One Murray cod, five Trout cod, five Macquarie perch and 14 Redfin perch were captured. Although Langtry did not provide a location for the netting, the late Wallace 'Laddie' Clifford, a professional fisherman of Barmah who knew Langtry, informed the author that the activity took place in the Peechelba area (Laddie Clifford, pers. com.). Langtry provided a general account of the Ovens fishery between Wangaratta and Yarrawonga Weir. He reported the presence of both cod species, Macquarie perch, Redfin perch, Tench and occasionally Silver perch. He noted the absence of Golden perch and the prevalence of Trout cod at the time. Langtry also highlighted the significance of the population of cod in Lake Sambell, and recorded that they appeared to be Trout cod (Cadwallader, 1977).

12.2 The Past Distribution of Fishes in the Ovens River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the Ovens Catchment into a lowland zone (downstream from Rocky Point near Myrtleford, and Moyhu), a slopes zone (upstream to Smoko, Abbeyards and William Hovell), and an upland zone beyond these locations, with a few headwater streams extending into a montane zone, the zones being defined by altitude. Confined valleys and gravel substrates typical of slopes habitat are found further downstream than these limits, to at least Everton in the Ovens River. Slopes type habitat extends upstream to King River Camp near Cheshunt in the King River, and Buffalo Dam in the Buffalo River, where the floodplain largely disappears, indicating commencement of upland type habitat. These amendments to the *Sustainable Rivers Audit* habitat zones have been used in the following discussion.

Much of the information presented below comes from senior residents recalling both their own experiences and stories told to them by past generations (mainly OH 96-109). It is supported by some early detailed

newspaper accounts and a relatively small number of photographs. Additional sources were Gladys Ellis, the wife of the late Bill Ellis, a professional fisherman who lived at Boorhaman, and Greg Dunkley a nephew of Bill Ellis. Both provided useful information on fish in the lower Ovens River based on Bill's experiences and their own observations not recorded in the oral histories.

12.2.1 The Montane Zone

Much of the montane zone in this catchment is effectively isolated from downstream fish populations by steep gradients and waterfalls at the base of Mt Buffalo and the Wabonga Plateau. The exceptions may have been in the upper King and Buckland Rivers, where the gradients are less severe. No information was obtained to indicate that any larger native fish species were historically present in the montane zone. It is suspected that river Blackfish may have been present in some areas in the montane zone based on their current presence in similar habitat in the adjacent Goulburn and Mitta Mitta catchments, as reported in the *Sustainable Rivers Audit.*

12.2.2 The Upland Zone

There is good historical evidence that substantial populations of cod, Macquarie perch and Blackfish were present in this zone, particularly in the Buffalo River (Carmody, OH 98; Mitchell, OH 100) and the King River (Burrowes, OH 107; Suffield, OH 108). A newspaper account reported that a bushfire in 1914 killed huge numbers of fish in the Buffalo River, describing how 'their dead carcases, large and small, could be seen floating down the river. The party found it impossible to estimate the number of dead fish seen' (*Argus*, 2 February 1914). This account, combined with the oral history of very large numbers of cod being taken by a road building team at Abbeyards, 'enough taken in one evening to feed 130 men' (Mitchell, OH 100), suggests that cod were originally very common in upland habitat in the Buffalo River.

The recollections of many people are that most of the cod in the Buffalo River upstream of Dandongadale were Trout cod. These include the Holt brothers from Beechworth (Holt, OH 102; Holt, OH 103) who were familiar with the species in Lake Sambell, and Bert Carmody, who also noted that cod were present in the lower Catherine River (Carmody, OH 98). Bert McKenzie reported that he caught mainly Trout cod upstream of Nug Nug around 1932, but caught both Murray cod and Trout cod closer to Myrtleford (McKenzie, OH 96). An old photograph of cod caught in the Buffalo River may include a Trout cod based on general body form, though the image is too poor to discern markings (OR4). Small numbers of Trout cod were caught by anglers between Dandongadale and Abbeyards until the early 1980s. One specimen was photographed by the author (OR21) and delivered alive to the Inland Fisheries Research Station at Narrandera in 1980. In addition, it is clear from the oral history, that Macquarie perch were once very common to abundant in the upper Buffalo River, and at least present in its larger tributaries the Dandongadale and Rose Rivers (Mitchell, OH 100; Daws, OH 99).

The oral history records that both cod and Macquarie perch were once present in the King River above Cheshunt, with cod penetrating to at least the 'Bog Hole' about 18 kilometres upstream of the present William Hovell Dam (Burrowes, OH 107; Suffield, OH 108). Cod were so common in the area that they provided a reliable food source for the Burrowes family who lived near where the dam wall now stands (Burrowes, OH 107). A newspaper story supports the oral history, recording cod and bream as being common near Cheshunt until 1915 (*Argus,* 5 February 1915). Two anglers specifically described Trout cod as having been abundant in the lower reaches of the King River (Carmody, OH 98; Suffield, OH 108), with reports of captures as far upstream as Whitfield (Suffield, OH 108) and near Cheshunt (Holt, OH 103). These accounts and the capture of the occasional Trout cod in the Cheshunt area up to the early 1980s, including one that was photographed by

the author (OR20), suggests that they would have been present in the upper reaches of the King River as part of the reported cod captures. Cod were also originally present in the upland zone in the lower Catherine, and near the boundary of the slopes and upland zones at Buckland Junction and the Ovens River near Germantown (Carmody, OH 98). Macquarie perch have been reported from the outskirts of Harrietville in the upper Ovens River (Carmody, OH 98). Blackfish were recorded as common in the Brandy Creek on the upper Buffalo River in 1887 (Morgan, 1908).

Using the information available from the Buffalo and King Rivers, it may be inferred that cod, particularly Trout cod, Macquarie perch and Blackfish, were once common to abundant in at least the lower reaches of the larger upland rivers of the Ovens Catchment. A relic population of Catfish persists in one lagoon near Harrietville in the upper Ovens River (Jarod Lyons, pers. com.) suggesting that this species reached the very bottom of this zone in at least the Ovens River.

12.2.3 The Slopes Zone

A number of first hand oral accounts suggest that Trout cod, Murray cod, Macquarie perch and Blackfish were once common to abundant in this zone. Cod were reported to be very common near Bright where, as late as 1926, a newspaper account recorded that many cod were taken from the Ovens River (*Argus,* 17 March 1926). Cod were originally present in some of the larger creeks such as the Barwidgee and Rose White Creeks near Myrtleford (Grattidge, OH 97), as well as Morses Creek near Bright (*Argus,* 17 March 1926). Cod were also present in lagoons, with a 54 lb. (24.6 kg) fish found stranded in one near Porepunkah (*Argus,* 26 January 1938).

At Porepunkah cod were on the menu of the hotel there in 1863 (Symons, 1870) and oral history recalls the presence of Trout cod at that location (Carmody, OH 98). Trout cod were abundant in the Ovens River near Myrtleford until around 1930 (Carmody, OH 98; Grattidge, OH 97). A cod was captured and photographed downstream of Eurobin in 1948, and may be a Trout cod (OR26). Downstream from Dandongadale the oral history recalls that Trout cod and Murray cod were common in the lower Buffalo River (McKenzie, OH 96; Carmody, OH 98), with photographs recording the presence of the latter (OR31; OR32).

Bert Carmody recalled that small Trout cod were almost in pest proportions in the Ovens River at Gapsted in the late 1920s when he was a boy (Carmody, OH 98). Trout cod have been reported as having been abundant towards the bottom of the slopes zone in the Everton area (Carmody, OH 98; Suffield, OH 108). The oral evidence that Trout cod were abundant in the slopes zone is supported by the creation of the Trout cod population in Lake Sambell at Beechworth. Although it is probable that some Murray cod were included in the fish released into the lake, there is no evidence from photographs or oral history of the species having been present in the water. A very small number of photos of catches of cod from the lower slopes zone of the Ovens River have been located. These date from the 1930s (OR11-15), and contain images of large Murray cod. It appears that Trout cod were once abundant in the rivers and their larger tributaries in the slopes zone of the Ovens Catchment. Murray cod were common and some very large specimens were taken, but small Trout cod were prevalent.

Several witnesses recall Macquarie perch and Blackfish having been generally abundant in the rivers and creeks of this zone (Carmody, OH 98; Grattidge, OH 97; Kneebone, OH 101), with Bert Carmody recalling that both were common in lagoons (Carmody, OH 98). Oral history suggests that Silver perch may also have occurred in this zone penetrating well upstream, their seasonal presence possibly related to spawning migrations. Gary Daws (Daws, OH 99) reported that his father-in-law caught numbers of ‘grunter’ in a drum

net at Rocky Point c1930. He highlighted the fact that they were different to the Macquarie perch frequently captured. Walter Grattidge also reported that some 'grunter' (Silver perch) were captured from a lagoon at nearby Whorouly (Grattidge, OH 97). Les Maples recalled the late Jim Skins catching Silver perch as a boy at Whitfield, in the 1920s. Jim Skins was apparently able to differentiate between Macquarie perch, which were common at Whitfield at the time, and the much less common Silver perch (Maples, OH 109). Small numbers of 'grunter' or Silver perch were also caught in the Everton area during the 1930s (Carmody, OH 98).

Catfish were common in the lagoons and larger creeks of the slopes zone, and regularly taken in the quiet backwaters of the Ovens River itself in the Everton, Whorouly and Myrtleford areas (Grattidge, OH 97; Kneebone, OH 101; Daws, OH 99; Carmody, OH 98; O'Connor, OH 111). They were reported as far upstream as lagoons near Porepunkah (Carmody, OH 98), and at Bright (Cole, 1908). There is a relic population present today near Harrietville (Jarod Lyons, pers. com.). Catfish were present as far upstream as billabongs in the Claremont area of the King River (Burrowes, OH 107). They may have penetrated further upstream to near Cheshunt, where suitable lagoon habitat existed.

The oral history suggests that Golden perch reached the lower reaches of the slopes zone, but they appear to have been uncommon in this habitat in the Ovens Catchment with few mentions in oral accounts (Carmody, OH 98; Holt, OH 102). One newspaper account suggests that in the early years Golden perch were taken in numbers as far upstream as Whitfield (*Argus*, 22 August 1936).

12.2.4 The Lowland Zone

Historic written and oral records suggest that most of the larger native fish species were originally very common to abundant in this zone, the main exceptions being Golden perch and Silver perch. The oral history reports Golden perch as having been uncommon in the Ovens River itself, more frequently captured from the billabongs in the late 1920s (Knox, OH 106). Occasional captures were made in the Wangaratta area, but they appear to have been more regularly encountered further downstream in the Ovens River (Kneebone, OH 101; Suffield, OH 108). Silver perch were reported to be usually uncommon, though caught in numbers from time to time when schools were encountered (Knox, OH 106). John Langtry also reported occasional captures from the Ovens River taking place around 1948 (Cadwallader, 1977). The reported relative scarcity of these two perch species in oral accounts may have been the product of an early decline in the Ovens Catchment. A newspaper account reported that, originally, Golden perch were fairly common in the lowland zone (*Argus*, 22 August 1936). Another reported large specimens being taken from the King River (*Argus*, 13 March 1925). The limited available evidence may under-estimate the original abundance of Golden perch and Silver perch in this catchment. Both species were taken in numbers during a survey at Albury as late as 1928 (NSW Fisheries Report, 1929) suggesting that they originally may have had a significance presence in the lower Ovens River.

The historic presence of Trout cod in the lower Ovens is confirmed by Langtry's accounts (Cadwallader, 1977), as well as a photograph of a large Trout cod in *The Complete Book of Australian Fishing* (Hungerford, 1976) that was caught in the Ovens River near Peechelba in 1959 (Lance Wedlick, pers. com.). It is apparent that both Trout cod and Murray cod occurred in the lowland zone, although their relative abundances are uncertain. Langtry noted that Trout cod were 'prevalent' in the Ovens River, but apart from the limited netting data, did not explain how he reached this conclusion. 'Black Trout cod' were caught in the Boorhaman area by Bill Ellis who considered them to be nearly as common as Murray cod prior to the 1950s (Gladys Ellis, pers. com.).

Trout cod were reported to be less common than Murray cod in the Wangaratta area in the 1930s (Knox, OH 106), but very common in the Ovens River upstream near Tarrawingee, as well as in the lower King River near

Targoora, and in Yellow Creek (Suffield, OH 108). Trout cod were also particularly common at the top of the lowland zone in the King River, where they were referred to as 'King cod' (Carmody, OH 98; Suffield, OH 108). The Holt brothers also recalled their father catching the species in the King River around the time of the Second World War (Holt, OH 102; Holt, OH 103). The differences in the abundance of the two cod species in the lowland zone reported in the oral history may reflect on local variations in habitat. Oral history suggests that Murray cod were more prevalent below Wangaratta, and Trout cod more prevalent upstream, however, definitive data is lacking. Murray cod up to 78 lb. (35.5 kg) were taken from the lower reaches of the Reids Creek near Wangaratta (*Argus,* 28 September 1867), and one of 58 lb. (26.4 kg) from the Maloneys Creek near Oxley (*Camperdown Chronicle,* 10 February 1931). Overall, both cod species were abundant in the lowland zone, though Trout cod have not been reported from lagoon habitats. Murray cod were frequently taken from lagoons near Wangaratta and near Boorhaman (Knox, OH 106; Gladys Ellis & Greg Dunkley, pers. com.).

Catfish were once common in the lagoons near Oxley (*Argus*, 14 December 1917; 26 December 1917) and in Wangaratta (Knox, OH 106). They were regularly caught from the Ovens River itself near Wangaratta until the 1930s (Suffield, OH 108), and were taken in the quiet backwaters of both the Ovens and lower King Rivers near Oxley (Carmody, OH 98). Multiple oral accounts report Macquarie perch to have been abundant in the Ovens River (Knox, OH 106; Carmody, OH 98; Suffield, OH 108). Macquarie perch and Blackfish were once abundant in both the river and the lagoons in the Boorhaman area, small perch and Blackfish being considered as pests during the early 1930s (Gladys Ellis, pers. com.). At Boorhaman, Catfish were abundant in lagoons and fairly common in the river itself, and at times 'grunter' (Silver perch) and Golden perch were captured from both types of habitat (Gladys Ellis & Greg Dunkley, pers. com.). Blackfish appear to have been generally abundant in all lowland habitats, including creeks such as the Hurdle Creek near Oxley (Carmody, OH 98).

12.2.5 Estimates of Native Fish Abundance in the Ovens River Catchment at European Settlement.

Presented below are the rarity scores used in the *Sustainable Rivers Audit* (Davies *et al.,* 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 12.1 Ovens River Catchment Rarity Scores (Main River Channels)

	Lowland* Murray River to Everton & Moyhu		**Slopes*** Everton & Moyhu to Smoko, King River Camp & Buffalo Dam		**Upland* †** Smoko, King River Camp & Buffalo Dam to 700m ASL		**Montane** Upstream of 700m ASL	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA†**	**True Tales**
Trout cod	5	**5**	3	**5**	1	U3	0	0
Murray cod	5	**5**	1	**U3**	0	U1	0	0
Golden perch	5	L3	1	1	0	0	0	0
Silver perch	3	L3	0	U1	0	0	0	0
Macquarie perch	5	**5**	3	**5**	3	**L5**	0	0
Catfish	1	**3**	0	L3	0	L1?	0	0
'Blackfish'	3	**5**	3	**5**	3	**5**	0	?

Key

0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type supported by multiple accounts or lines of evidence e.g. oral history, newspaper accounts, photographs

* Note: Some of the boundaries used for this zone are at a lower altitude than those used in the *Sustainable Rivers Audit*

† Note: Most of the evidence for these ratings comes from the Buffalo River near Abbeyards and the King River above William Hovell Dam.

Figure 12.2 Historical Records for Murray cod and Trout cod in the Ovens River Catchment

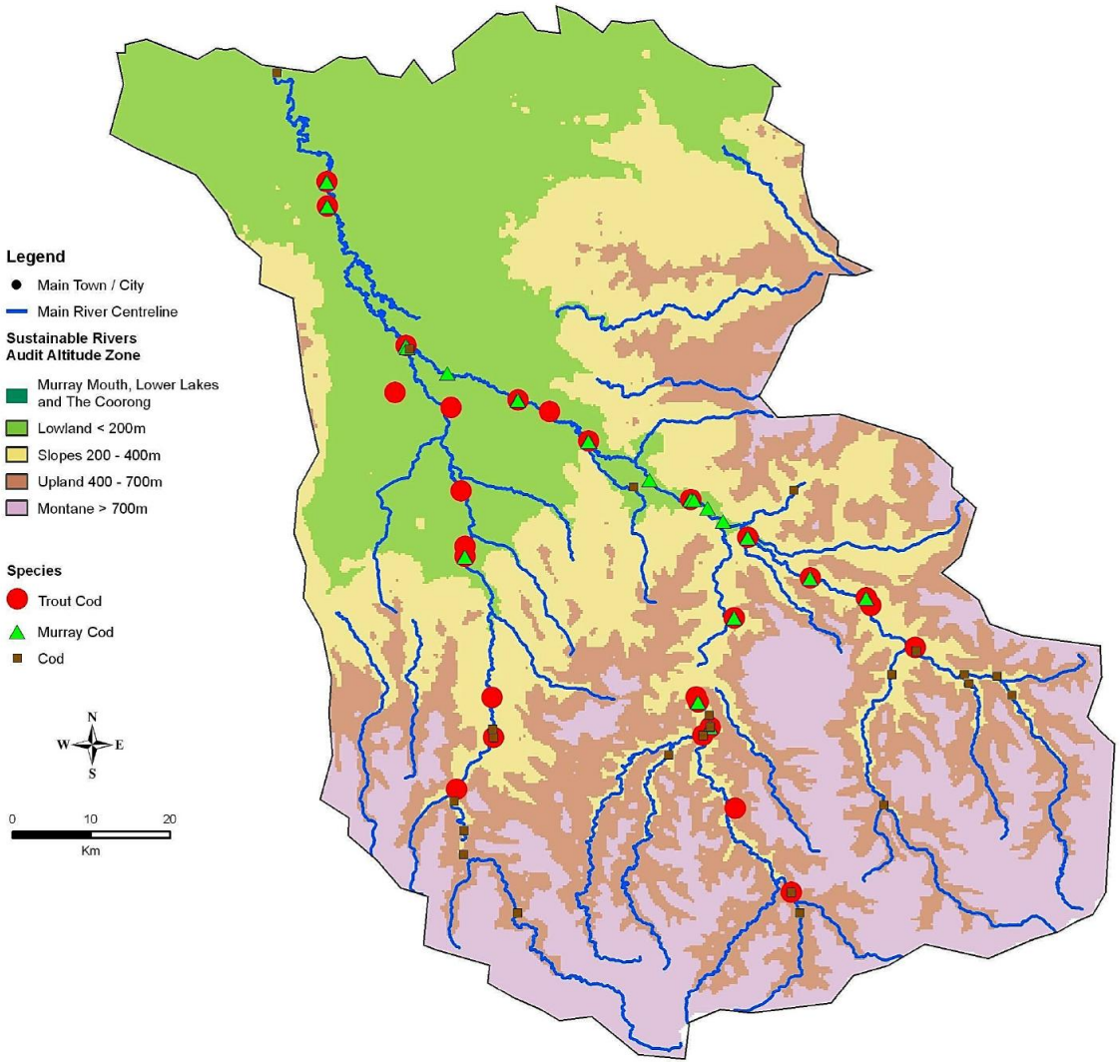
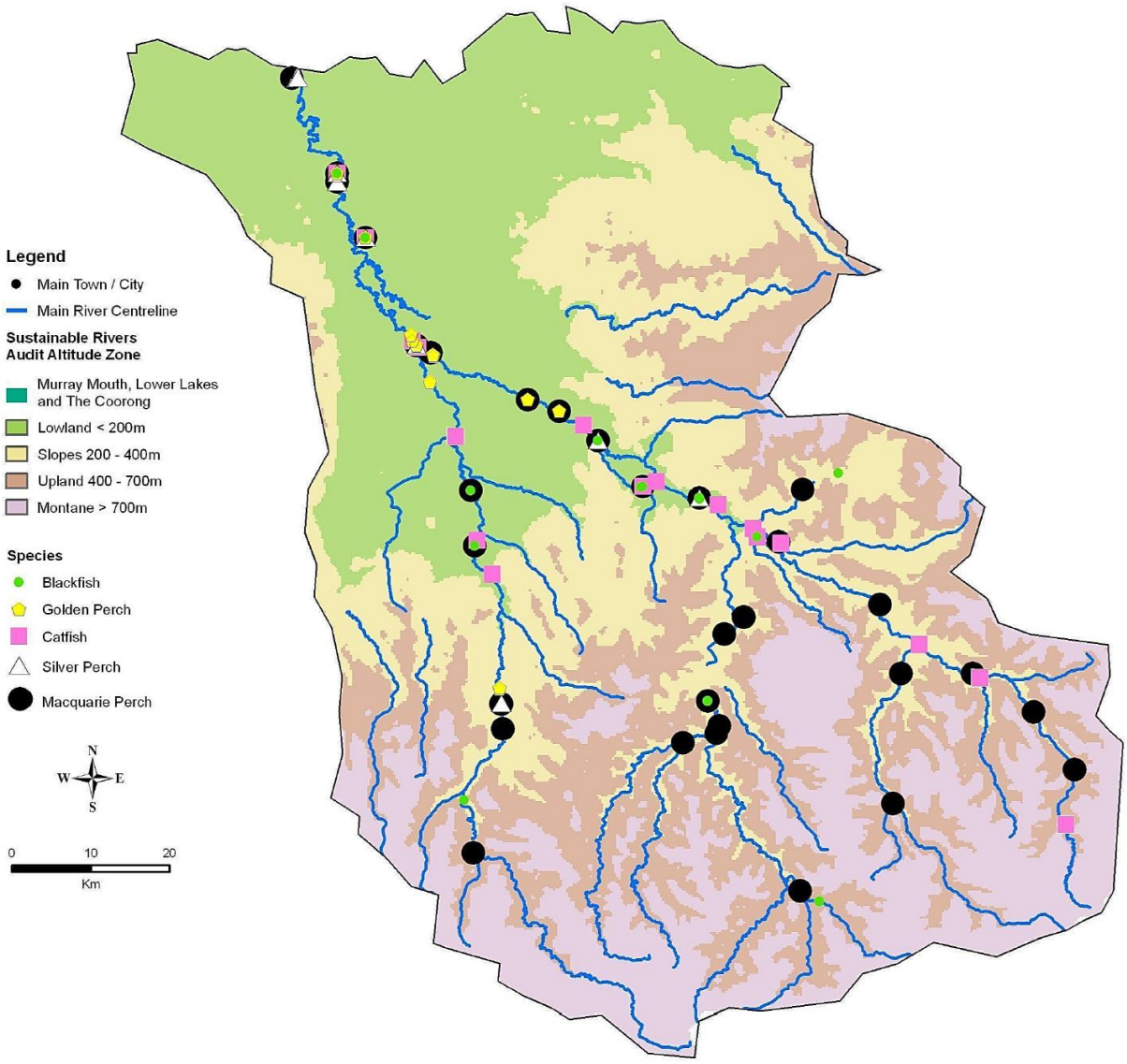


Figure 12.3 Historical Records for Native Fish Species other than Cod in the Ovens River Catchment



Photograph 12.1 Eurobin Catches

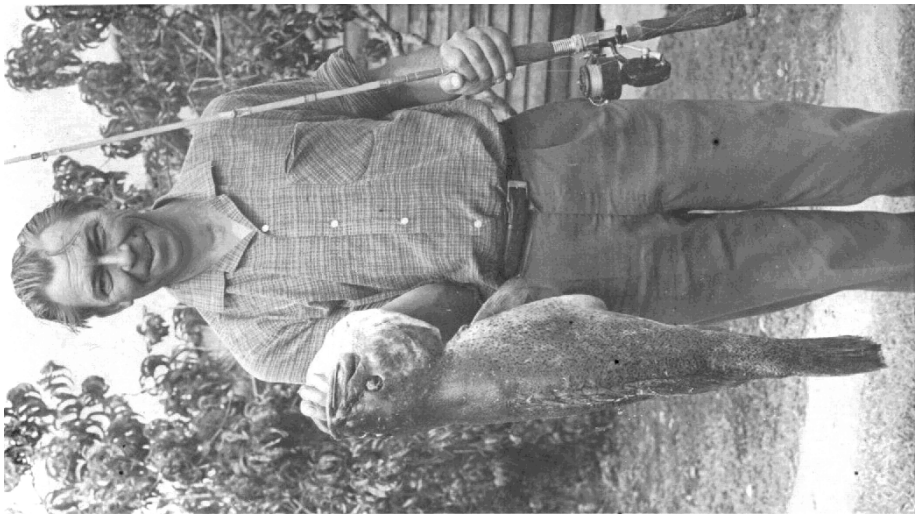
These two photographs record captures of species reported to be once common in the Ovens system. The top photo (OR25) is of a 2½ lb. (1.1 kg) Macquarie perch caught from the Ovens River at Eurobin, Christmas 1947. The lower photo (OR26) is of a 5 lb. (2.3 kg) cod in a catch of trout, which from the body markings and head could be a Trout cod, caught in the same area Christmas 1948. Both photographs courtesy of Jim Masters.

Photograph 12.2 Trout Cod from the Buffalo and Ovens Rivers

Left: Photo OR4. Two cod caught by Wally Mitchell one evening on a spinner from the Buffalo River near Dandongadale c1955 in upland habitat. The fish on the left may be a Trout cod based on the features of the head and its very long caudal peduncle. Photo courtesy of Wally Mitchell.

Right: In this photo an unknown angler holds a large Trout cod caught in the Ovens River near Peechelba in 1959. Photo courtesy of the late Lance Wedlick.

Photograph 12.3 Trout Cod from Lake Sambell



Right: Photo OR1. Jack Rhodes holds a 20 inch 'bluenose' angled from Lake Sambell, Beechworth c1948. Jack went on to join the Victoria Fisheries and Game Department as an inspector, recording the recollections of anglers in north eastern Victoria including some who recalled catching Trout cod in past years. Photo courtesy of J. O. Rhodes.

Middle: Photo OR9. A 23½ lb. (10.7 kg) Trout cod caught from Lake Sambell, Beechworth by Roy Holt, 1950. Photo courtesy of Allan Holt.

Right: Bill Surrey of Beechworth holds a 19 lb. (8.6 kg) Trout cod taken from Lake Sambell in February 1969. The story of its capture was reported in the *Ovens and Murray Advertiser* on 13 February 1969 and this photo was published the following week. Note the absence of an eye stripe in this specimen. Photograph courtesy of the *Ovens & Murray Advertiser*.

Photograph 12.4 Suffield Family Catches

Top: Photo OR12. Max Suffield (far left) and his father Gordon (far right) with a catch of Murray cod from the Ovens River near Tarrawingee c1935.

Bottom: Photo OR13. The Suffield family with a catch of Brown trout from the King River near Cheshunt c1945. Max Suffield and Don Burrowes recalled stories of cod and bream having been once common in the upper King River. Don's Grandfather concluded that their rapid decline was a result of trout being introduced to the water. Both photos courtesy of Max Suffield.

Photograph 12.5 Last Trout Cod in the Ovens

Relic populations of Trout cod survived in the Ovens Catchment into the early 1980s, finally disappearing during the severe drought of 1983.

Top: Photo OR21. Local anglers occasionally caught Trout cod between Dandongadale and Abbeyards in the Buffalo River. This fish was captured in 1980 and delivered alive to the Inland Fisheries Research Station at Narrandera.

Bottom: Photo OR20. Max Suffield and other anglers occasionally caught Trout cod in the King River at around the same time. This small specimen was captured by an angler near Cheshunt and given to the author as proof of their continued presence in the King River. Both photos from the author's collection.

12.3 The Changes

12.3.1 Changes to Native Fish Distribution and Abundance

In the upland zone, apart from Blackfish, native fish have been scarce for most of the twentieth century with the exception the Buffalo River. There is evidence of their persistence in the upper Ovens and Buckland Rivers until the 1930s, but captures of Macquarie perch and in particular cod, were unusual (Carmody, OH 98; Grattidge, OH 97). In the remote upper King River, oral history indicates that cod and 'bream' were common around 1900 but then rapidly declined so that by the 1920s they were scarce upstream of Whitfield (Burrowes, OH 107; Suffield, OH 108). In the upper Buffalo River bushfires caused a large fish kill in 1914 (*Argus*, 2 February 1914), but good populations of cod and Macquarie perch remained until the 1939 bushfire (Mitchell, OH 100). After the fires, Macquarie perch had recovered by the 1950s but cod, while still regularly taken, were much less common than they had been prior to 1939 (Mitchell, OH 100). In the late 1970s occasional Trout cod were captured from the Buffalo River near Abbeyards, but no further captures took place after the drought of the early 1980s (author's observations; OR21).

In the slopes zone, oral history and newspaper accounts record major declines in native fish populations during the 1930s. Catfish had been reported as being common in lagoons and in the Whorouly Creek in the late 1920s, but by the 1930s had become scarce (Kneebone, OH 101; Carmody, OH 98). A newspaper article reported one angler's observations that billabongs near the Ovens and King Rivers had contained 'plenty of catfish, but now they and the northern rivers and water channels are full of redfin' (*Argus,* 27 March 1936), providing a similar time frame for the loss of Catfish populations. Isolated pockets persisted in some areas until the early 1950s, such as in a lagoon near Rocky Point (Daws, OH 99).

Macquarie perch were reported to have been prolific in the lower slopes zone of the Ovens River in the 1920s, but had disappeared from many areas by the 1940s. By the 1950s the species had become scarce in this zone (Carmody, OH 98; Kneebone, OH 101). Cod populations also declined during the 1930s, with the scarcity of smaller fish being noted (Carmody, OH 98). By World War Two fewer, larger cod of both species were being taken, though the fishing was still considered reasonably good in the Ovens River downstream of Myrtleford, and in the King River downstream of Edi. By the 1970s, the cod fishing was considered fairly poor (Carmody, OH 98; Suffield, OH 108). Occasional captures of Trout cod continued in the King River and the Ovens River near Everton up to the early 1980s (Suffield, OH 108; author's observations; OR20).

In the lowland zone, Langtry captured Macquarie perch from the Ovens River in 1948 (Cadwallader, 1977) but many accounts describe their scarcity compared to past years in lowland areas (*Argus*, 14 January 1939; Carmody, OH 98; Kneebone, OH 101). Langtry recorded that the last captures of Golden perch in this catchment occurred in February 1938, but that Silver perch were still occasionally taken from the Ovens River as late as 1948 (Cadwallader, 1977). During the 1930s in the Boorhaman area, a dramatic decline took place in the abundance of Macquarie perch, Catfish and Blackfish, with Catfish virtually extinct by the 1960s (Gladys Ellis, pers. com.). Good numbers of both cod species were taken into the 1950s, though small fish had become scarce. By the 1970's Trout cod were rare captures (Gladys Ellis & Greg Dunkley, pers. com.).

12.3.2 Changes to Habitat

On the upper Ovens, Buckland Rivers and streams in the Beechworth area, the gold rush initiated major changes to the environment. The vegetation was rapidly cleared by the miners (Brough Smith, 1869), and the working of the alluvium brought changes to the streams themselves, including degraded water quality and the destruction of habitat (Howitt, 1855). Late in the nineteenth century bucket dredges commenced operation on

the Ovens River near Harrietville, Myrtleford, and on the Woolshed Creek at Eldorado. The Cocks Eldorado gold dredge ceased operating in 1954 and was the largest in the southern hemisphere (Flett, 1979). The introduction of bucket dredging in the 1880s accelerated the destruction of local streams (Lloyd & Nunn, 1987). The disturbance of the alluvium created mobile silt slugs which progressively filled in holes further downstream in the waterways of the slopes zone. In the lowland zone, well away from the mining activity, sediment from mining on creeks had caused silting of the Ovens River near Wangaratta by 1907 (*Adelaide Advertiser,* 2 May 1907; Victorian Government, 1913). This was noted around 1950 by Langtry who recorded silting of holes from previous mine workings on the Yellow Creek (Cadwallader, 1977). Limited mining had taken place in the Buffalo River catchment and in the King, apart from some small mines near Edi, no significant mining activity occurred (Flett, 1979).

Bushfire events such as those on the Buffalo River in 1914 and 1939 caused major fish kills. Apart from the immediate impacts of runoff, long term degradation of habitat, such as the silting of holes, probably occurred after the fires. This was reported in the Buffalo River after the recent 2003 bush fire (Lyon & O'Connor, 2008). In 1939 the Yarrawonga Weir was completed, isolating fish stocks in the Ovens Catchment from those downstream. Parts of the lower Ovens River were desnagged during the 1890s (*Argus,* 18 December 1890, 24 April 1891, 29 July 1891), with further work being undertaken in the 1930s in the lower Ovens and the Barwidgee Creek (*Argus,* 26 March 1936, 23 September 1939). During the 1940s and 50s, river improvement trusts conducted works in some areas of the slopes zone of the Ovens catchment, notably the King River near Cheshunt, and the Ovens River near Myrtleford. Their activities included snag removal and straightening of the river bed (*Argus,* 5 February 1940; Daws, OH 99; Burrowes, OH 107). Two small impoundments were constructed, Lake Buffalo on the Buffalo River in 1965, and Lake William Hovell on the King River in 1973. While modest in size, these impoundments modified downstream flows, and may have introduced some degree of thermal pollution (Ryan *et al.,* 2001). They also form large insurmountable barriers to upstream fish passage.

Late in the nineteenth century salmonids were introduced to the Ovens Catchment. They rapidly spread throughout much of the upland and slopes zones and were aided by releases from hatcheries (Clements, 1988; Ritchie, 1988). At the time of their introduction to the remote upper King River around 1900, the area had not been settled, mined or cleared, and was only lightly grazed. By the 1920s, cod and Macquarie perch had virtually disappeared from the upper King River, but remained common downstream of Whitfield. The opinion of local residents was that the introduction of trout caused the decline of native fish in the upper King River (Burrowes, OH 107; Suffield, OH 108). The oral history of the impact of trout in the upper King River is supported by newspaper accounts (*Argus*, 5 February 1915; 22 August 1936). One individual directly involved in liberating trout into some north eastern Victorian streams in the 1890s, observed the subsequent disappearance of native perch from some waters that remained in near pristine condition, concluding that trout were responsible (*Sydney Morning Herald,* 22 June 1928). Langtry, in 1948, considered trout to be a major influence on native fish populations, reporting the predation of Blackfish by trout and a scarcity of cod and bream in areas where trout were abundant in the Ovens Catchment (Cadwallader, 1977).

It appears that Redfin perch first arrived in the Ovens Catchment during the 1920s (Knox, OH 106), gaining access from the Murray River where they were reported at Yarrawonga in 1914 (*Argus*, 26 June 1914). The oral history tells us that they became common throughout the lowland zone and most of the slopes zone by the early 1930s (Knox, OH 106; Kneebone, OH 101). The opinion of local anglers, as well as a newspaper account, was that the arrival of Redfin perch had a serious impact on native fish populations in the lowland and lower slopes zones, coinciding with rapid declines in some native fish populations, particularly Catfish and Macquarie perch (Knox, OH 106; Kneebone, OH 101; *Argus*, 27 March 1936, 22 August 1936). Redfin perch were the main capture from the Ovens River in 1948 as reported by Langtry, who also considered them to be a major problem (Cadwallader, 1977). After the filling of Lake Buffalo during the 1960s Redfin perch, which had been present in

small numbers in the river, proliferated and dominated the storage (Daws, pers. com.). They may be implicated in the subsequent decline of the remnant Macquarie perch population. European carp arrived in the catchment during the 1970s, and progressively spread upstream. While loathed by many anglers, most declines in native fish populations clearly occurred prior to their arrival.

The translocated Trout cod population in Lake Sambell was identified as being important for the conservation of the species by Berra and Weatherly (1972). It has been reported that the population was wiped out by a fish kill in the early 1970s which has never been explained (Trout Cod Recovery Team, 2008). Juvenile Trout cod were fairly common in the lake until the 1950s, but after the introduction of Redfin perch around 1955, they became less common (Jack Rhodes, pers. com.; Holt, OH 102; Lance Jervis, OH 104). Reproduction still occurred, with four juvenile fish being captured from the lake and lodged with the *Australian Museum* in August 1960 (*Australian Museum* database). The *Ovens & Murray Advertiser* of 22 April 1964 reported damage to the outlet tunnel of the lake, necessitating the lowering of the water level to effect repairs. It also outlined plans to raise the retaining wall and expand the lake while water levels were low, enlarging the area of the lake from 28 to 37 acres. With the lowering of the lake, contingency plans for removal of fish by the Fisheries Department were enacted, including the capture of the cod and their retention in tanks until the lake refilled. The rescue of cod was confirmed to the author as having taken place by local residents (Iris Mannik, Lance Jervis, pers.com.).

The *Ovens & Murray Advertiser* of 31 January 1968 reported that the Fisheries Department had suggested that the stable water level of the new lake inhibited the reproduction of the cod. During September 1970 a large fish kill decimated the Trout cod population in Lake Sambell, with fish up to 30 lb. (13.6 kg) being found dead (*Ovens & Murray Advertiser Advertiser*, 12 September 1970). Joe Kraus' account indicates that many dozens of large Trout cod died during the kill, which apparently only affected the cod (Joe Kraus, OH 105; Joe Kraus, pers. com.). Two hypotheses have been suggested by local residents as causing the fish kill. One explanation was that the raising of the water level of the lake flooded old mine tailings, releasing toxic substances which killed the fish. The raising of the water level took place in 1964, well before the kill in 1970. A similar hypothesis touted is that the increased water levels may have caused the death of aquatic vegetation producing eutrophic conditions. From local residents the source of the latter hypothesis appears to be a lowering of the lake in the mid 1970s, which upon its filling resulted in a fish kill in which a few dead cod were seen. This event was of much lower magnitude than the event in 1970 (Iris Mannik, Lance Jervis, pers.com.). While it might have been the coup de grace, the kill that decimated the population in 1970 was a far larger event. The hypothesis touted in the local newspaper that the fish perished by becoming eggbound is not plausible, as cod held in hatchery ponds that fail to spawn resorb oocytes and do not die (author's observations).

The demise of the Trout cod population in Lake Sambell is most likely to have been caused by three or four agents working in succession: - the arrival of Redfin perch in the 1950s; the lowering of the lake in 1964 which probably allowed many smaller fish to escape downstream; the stable water levels in the new lake being less suitable for recruitment; and the 1970 fish kill that probably wiped out most of the population. The most plausible cause of death of the Trout cod in September 1970 is an outbreak of *Chilodonella*, a virulent protozoan parasite which kills cod during the spawning season (Rowland & Ingram, 1991). Subsequent to the 1970 fish kill, a few Trout cod were taken from the lake (*Ovens and Murray Advertiser,* 22 April 1971), with the last reported capture being a 16 lb. (7.3 kg) specimen caught by local angler John Rutten in October 1979 (John Rutten, pers. com.).

12.4 The Current Situation

The *Sustainable Rivers Audit* noted in the Ovens catchment that 'significant numbers of several native species were recorded, including Trout cod, the two blackfish species and Murray cod'. For the two cod species most fish were recorded from the lowland zone, with much fewer larger native fish, apart from Blackfish, being present in the slopes and upland zones. It concluded:

> The Ovens Valley fish community was in Poor Condition, with the Upland Zone community in Very Poor Condition. Only 59% of predicted native species were caught; these were only half of the total catch and a quarter of the biomass. The community had lost much of its native species richness and alien fish were abundant (Davies *et al*., 2008).

Since the 1970s Murray cod have undergone a natural recovery in the Ovens Catchment, more recently aided by hatchery releases. By the 1990s the Murray cod became regular catches downstream of Myrtleford and Whitfield. The factors responsible for their recovery are unclear, as the habitat was not significantly improved. While the species had been stocked, the initiation of the recovery predates those releases. Stockings of Golden perch and later Trout cod have re-established these two species in the catchment. Trout cod are now being regularly caught as far upstream as Porepunkah in the Ovens River, and Whitfield in the King River (Gary Daws, Len Maples, pers. com.). Stockings of juvenile Macquarie perch, as well as translocations of adults from Lake Dartmouth into the upper Buffalo River, supported a small self-supporting population in that water which was severely impacted by the December 2003 bushfire (Lyon & O'Connor, 2008).

While the rivers of the lowland and slopes zones of the Ovens Catchment clearly have potential for re-establishing major populations of native fish, providing uninterrupted passage for fish all the way downstream to the Murray River, the upland zone looks somewhat less promising. The two rivers not containing obstacles in the form of dams, namely the Buckland and upper Ovens, have been degraded by alluvial mining. The other two rivers containing much better habitat, the Buffalo and the King, are fragmented by the presence of dams. These dams prevent the connectivity of habitat important to providing resilience of native fish populations to disturbances such as bushfire and drought.

The Trout cod population in the lowland and slopes habitat of the Ovens River, and the Macquarie perch population in the upland Buffalo River, are of great conservation significance and provide examples, albeit diminished, of the native fish assemblage that once existed in north east Victoria. The Ovens River downstream from Myrtleford, as part of the Murray-Darling Basin Authority's *Native Fish Strategy,* has been designated as a 'demonstration reach' where a range of rehabilitation activities will be conducted with community participation to improve habitat and restore native fish populations.

12.5 Newspaper Highlights

Argus, 30 November 1867
A few mornings since, a school-master in the employment of Mr. James Byrne, farmer, King River, who enjoys the reputation of being a keen disciple of Old Izaak, when engaged fishing in the river near his residence landed a thirty-four-pound cod which had swallowed one of eight pounds, and a fourteen-pound fish which had like-wise an eight-pounder inside, making a total of sixty-one pounds at one haul, with only two hooks.

Argus, 25 January 1871
"We have heard a good deal," says the Ovens Spectator, "of the extraordinary numbers of fish taken out of the Ovens River by the baskets of Mr. Henley's wheel at Oxley, which he uses for lifting water for irrigation purposes. On a recent visit to Mr. Henley's, we witnessed the curious process – one never contemplated by the proprietor, speculative as he is. The buckets are rather deep, and as the fish endeavour to make up the river, they get into them as they pass, evidently to escape the force of the down current, and are thus lifted and emptied with the water into the flume. Large and small keep constantly turning up, and of all kinds, but they generally come in shoals, and we ourselves witnessed in half-an-hour some two dozen fish, chiefly bream, weighing from a few ounces to three and four pounds each. The small ones are of course returned to the river, but believe at least a hundred weight of saleable fish in the 24 hours is the rule and not the exception.

Argus, 16 August 1884
Picturesque Victoria. Myrtleford to Wandiligong. / the clearest river this Buffalo which I have seen in Australia, and as my courteous cicerone, the oldest inhabitant, tells me, it looks made for trout. It is a question, however, if the voracious Murray cod and perch which are in these waters would allow the speckled intruders to live.

Barham Bridge, 14 January 1913
Wangaratta is situated at the confluence of the King and Ovens rivers, and each of these streams was noted for its large fish. About forty five years ago a Chinese, on a day when the thermometer stood stationary 133 degrees in the shade, made a round of the Wangaratta hotels and other places likely to retail fish. "You wanta flesh Mully cod" was his invariable enquiry, and on such a day hotelkeepers and others did want "Mully Cod", provided it was "flesh". The Chinese assured them that the fish was still alive. He booked orders for 10lb here, 8lb there, and so on, until the total was certainly verging on to a hundred weight. Doubts began to assail some of the purchasers, and they demanded that the Chinese should show them his fish. He did so without hesitation. He conducted them to a spot on the bank of one of the rivers, where his cousin was calmly smoking and watching a Murray cod, which had been tethered by a rope passed through a gill and made fast to a sapling on the bank. That fish weighed 120lb when it had been cleaned, and the Chinese triumphantly fulfilled all his orders for "flesh Mully cod".

Argus, 2 February 1914
Charcoal Kills Fish. Bright, Saturday. – An extraordinary experience attended a party of Bright fishermen, who left here on Monday last for a week's fishing on the Buffalo River. After arriving at their destination, a severe thunderstorm occurred, and by Tuesday morning more than 2in. of rain had fallen. The bush fires, which had been burning fiercely around the river hills, were quenched, but the force of the heavy rain drove the charcoal from the burnt trees into the river, and shortly afterwards the charcoal ash began to play havoc with the fish in the river, poisoning them in hundreds, and their dead carcases, large and small, could be seen floating down the river. The party found it impossible to estimate the number of dead fish seen.

Argus, 5 February 1915
King River Fishing. Sport on the King River, about which "Couta" inquired, appears to be satisfactory. A friend at Lorne, who knows the district thoroughly, told me that cod, bream, and English trout are fairly plentiful from beyond Whitfield up to the Stony Creek. He has taken some nice cod with the spoon. Mr. G. E. Moore, of Wangaratta, says that there is good fishing (cod, bream, and perch) in the King and in the Ovens quite close to Wangaratta.

Argus, 14 December 1917
Catfish Spikes. "T.B." (Elwood) says that recently a fisherman who had just caught a catfish in a branch of the King River, near Oxley, told him that they should be handled with care, as a prick from their spikes was exceedingly painful and irritating.

Argus, 26 December 1917.
Movements On Land. "T.D." says that Mr. Jarman's note on the catfish coming out of the water to feed, encourages him to repeat a story told to him by an Oxley resident. One summer he saw about a dozen fine catfish in a pool which was rapidly drying up, near the King River. Next morning he went down with a bag to secure the catfish, but they were not there, and a careful search showed no trace of them. His theory was that they had "walked" over the bank into the next hole, which was still connected with the river, but that at the time he felt too dubious about the story to mention it."

Argus, 13 March 1925
Wangaratta. / Mr. A. H. Smith caught a golden perch in the King River, weighing 7¾lb. The weight is a record for a fish of this species.

Argus, 17 March 1926
Bright. / T. Forrestor, of Bright, landed a cod 18lb. in weight from Morse's Creek, at the rear of the Alpine Park, Bright. From the Ovens River many fish, ranging from 6lb. to 15lb., have been taken.

Argus, 22 August 1936
How to Preserve Murray Cod. / The chief inspector of the Fisheries and Game Department (Mr. Lewis) says that trout have not been introduced into any waters that are suitable for Murray cod. I think he is mistaken. The Waranga Basin is cod water, and trout were put in there more than 30 years ago. It boasted the best fresh-water fishing for cod, bream, and golden perch, but now you can fish there with rod and line and you will be lucky if you get a cod in a week. Redfins are there in thousands, also a lot of trout. Mr. Lewis says that trout have been introduced into the mountainous North-East streams. I know to my sorrow that Whitfield used to be good fishing for cod, bream, and golden perch, anywhere from the junction of the Murray and Ovens rivers, also from the junction of the Ovens and King rivers, but now it is the dry old redfins and trout. The only way to keep our cod is to destroy the redfins and trout. I heard of a trout being caught with nine small cod, about 1in. in length, in it. It is only in the last few years that trout have been caught in Wangaratta. Redfins are caught in thousands here in the lagoons and in the King River, the Ovens River, and Yellow Creek. I have caught more than 30 redfins a day. Destroy the trout and redfins and we will have cod, bream, and golden perch.

Argus, 14 January 1939
Angling Notes. / About 30 members of the Essendon Club visited Ramond, at the Junction of the Ovens and Murray rivers, and had fair sport despite the low water. The heaviest cod, 21lb., was caught by J. Smith, and the heaviest grunter, 7lb., by T. Barrell. Macquarie perch were scarce.

12.6 Ovens River Catchment Oral Histories

The following oral histories (OH 96-109) mostly discuss the Ovens River Catchment.

OH 96
The Late Bert McKenzie of Ruffy was interviewed in July 1982 at an age of 82 years.
(From Trueman & Luker, 1992)
I fished the Buffalo River at Myrtleford. Like a lot of other streams it was all silted with shallow pools and you could wade through them. You would wade up and you wouldn't see a fish in the day time. We had our tent right on the edge of the water. We heard fish playing around in the shade of the trees. We set a line there and got Macquaries and a couple of cod. I would say they were Trout cod but it's a long time ago[1]. That would have been 1932 actually. I only had two lines set there and there was sometimes two fish on the lines but always one. They were beautiful eating. I had the trout rod with me but you could not get anything in the daytime or see anything. But they were there.

Footnote: In the first meeting with the author the previous week Bert indicated that he fished the Buffalo River at Nug Nug and further upstream. In the Nug Nug area he reported catching both types of cod whereas further upstream he stated that the majority of the cod taken were Trout cod.

OH 97
Walter Grattidge of Myrtleford was interviewed in January 2007 at an age of 95 years.
I arrived in Myrtleford in 1928; we come as a family from Bacchus Marsh. We used to fish the Goulburn, camp up the river from Tallarook. In the river there we used to get both the Murray cod and the other type which we called a 'Pike cod'. The Pike cod had a different head, it looked savage, it had a long sharp head, big eyes. The colour was sort of grey and it had a pattern, lines and spots on it. They were in the Goulburn, my dad would camp at McCormick's out towards Tallarook, and we caught plenty of them there. There was a cod caught where we camped, on the Goulburn, by Mick Davey a pro, there on one of the nightlines. And it had a greyhound pup in it.

The people here told me in the Valley Creek, they said there was a lot of cod there in the real old days, but I caught a few. In the Barwidgee Creek, it was full of cod and bream in the early days. In Myrtleford, there was plenty of cod here, early on there was a lot of them, and not real big, from about 1930-40, they were common about 14-15 pound, with an odd one bigger. And the Pike cod were here too, my word they were, plenty, the most common, but both types. The depression buggered them, they all started fishing and catching rabbits to eat. Later on, after the war, they were fewer and bigger. I more or less fished mainly around Ovens, though I know the cod, odd ones, were being caught up around Eurobin in a big hole. I got bream, the Macquarie perch, and I got them a couple of times in the Valley Creek, as well as a 13 pound and a 17 pound cod. I caught bream in the Buckland near Walsh's, below the big cliffs, that's up past Porepunkah, about 4 mile up. We went up one Sunday; we caught half a dozen of them. A bloke told us he could get a dozen of them up there anytime. That was just after I was married, about 1934. The ones we got, they'd be a pound and a half.

The Catfish is one of the best eating freshwater fish, a 2 pound Catfish would give you more eating than any other fish at that size. I caught them in the lagoons at the Rose White, that's the Valley Creek. I never saw yellowbelly around here, only after they put them in the dam here. I've caught plenty out of the Yanco, they're good eating. I never saw grunter here, no. Dad used to go somewhere down in a big lagoon near Whorouly, there he caught grunter. Down there, there was a lot of Catfish in the lagoons down there. The redfin there, they buggered them up at Doug's place, Doug Hamilton. There was good water down there; yes there was a lot

of Catfish down there, and some grunter. And some tiger snakes! The redfin, they just landed, well one came in and one went out, prior to that there was lots of Catfish.

In the Buffalo River the cod were very dark. At Dandongadale, at the SEC line, that's where I caught cod in the Buffalo. We once took a boat up there and rode it down. We got 3 one night, not one over 3 pound, you would catch a trout up there too. Way up the river, near the scout camp, you could see the cod lying in there, 5 to 6 miles up past Dandongadale. Although I never caught them, there were bream all the way up the Buffalo. Wally Mitchell told me how he used to be able to catch a bream any time, after the cows crossed the river, that stirred them up! When he told me that, it would have been 50 years ago, and he was fishing for them 30 years before that. I saw him pull a drum net out, full of them, up near Abbeyards.

The Cudgewa Creek, I had a friend that had a farm up there, we quite often got a cod 14 to 15 pound. They were definitely the Pike cod, that's all we caught out of the Cudgewa at the time, that would be well over 30 years ago, more like 50 years ago, at least. The Kiewa, there was a power of fish in it; I used to fish it near Dederang. The cod out there before the fires, they had no green in them, they were more the colour of the greasies, silvery, had blue in them, Pike cod they were. They were lovely eating cod out of the Kiewa. This old chap, Kurt Case was out there when it happened, he told me there was a big bushfire and a storm, it washed all the ash in, that was in 39. Well it killed everything; the fish were far too gone to eat. The next year we caught little cod, Murray cod, all less than 3 pound, that was just below Dederang. After the fires well years later there were some big ones caught, up to 90 pound, and a lot of trout.

We used to use the old carp for bait. If we couldn't get a carp we would use yabbies, but carp were the best bait. And small redfin about 6 inches long, they're good bait, but don't last on the hook long. The cod bit best after the first flush of water in autumn, but you could catch them all year round, though they don't bite as much in winter. Back then I could get a cod pretty well when I wanted one, about 7-8 pound. I did a lot of cross lining in New South Wales and we would never get the cod out in the middle. The blokes that knew set them along the banks. Some blokes did a lot of spinning, they would stir them up, then I would catch them.

In the Rose White there were a lot of trout, I got one 7 pound, gave him to the bank manager. Stewart Cambell got one 8½ pound. I saw one 13¼ pound trout out of the creek; he was shot by the brother in law, Mick Broadbent. He borrowed my 303. He rang me up, told me to come along to see a decent fish. It was 32 inches long, 9 inches deep. The top of the Buffalo River never changes, it all rock. I remember old Eddie Walker, from the Ovens River Trust; they pulled all the old logs out. Well the holes filled up. That buggered some good cod holes in the Ovens.

OH 98

Bert Carmody of Wangaratta was interviewed in December 2007 at an age of 90 years.

I was born in 1917, at Whorouly. My father didn't fish much himself, he spent a lot of his time breaking horses, so did I, so I got to see a bit of the district, Bright, Everton, Moyhu, Whitfield. He wasn't a fisherman really, but he would take us fishing, I was keen on the fishing. I was fishing continuously through the 30s to the 50s, did some a bit before, been a fisherman all my life. Around Everton in the Ovens we used to catch the two types of cod, the Murray cod and a second type. He's got a different head, there was quite a different look about them, they didn't look as thick as the old cod. They had a pointier nose, a sharper build altogether. More spotted too, and generally grey or dull green. They were more in the faster water. When I was young I caught quite a lot of them, they're protected now.

Redge Tanner in Myrtleford had a wireless shop, he used to fish with me, at Everton, and Gapsted. At Everton you'd catch as many of the other type of cod as the normal Murray cod, perhaps more, and at Gapsted in the

faster water there was even more of them. That was in the early to mid-30s. I caught the different headed cod up to 30 pound, but mostly a lot smaller. I caught them at the time in the King as well, in Billy Sam's near Moyhu, near Whitfield too, and a lot in the Ovens at Everton. When I was young I thought they were the female cod, I thought it was strange that there were so many females in the King! But they were called by people a rock cod, they knew the difference. What they now call a Trout cod was back then the rock cod, I've seen them caught in recent years, it's the same fish, there's no mistaking them.

At Everton we used to catch a lot of bream, and you'd catch the redfin. The last of the bream I seen was up in the Buffalo River, they were a very sweet fish to eat. They were quite common back then, if you caught one you caught quite a few, they seemed to go round in shoals. We lived on the Buffalo River for 10 years, at Nug Nug, around the 1940s, then we shifted to Gapsted in 51. I knew the Mitchells, further up the river. We caught cod in the Buffalo, not real big ones, a big one was 14 to 20 pounds, both types of cod, 'bout the same number of each, at Nug Nug, they were fairly common. At the time there was an odd cod in the Dandongadale and a few bream about the Rose junction, but mainly trout.

We drove cattle up there for 6 years, up to Abbeyards and the Catherine Station. Up there at Abbeyards you would catch scores of trout, a bagful before dusk any night, and an odd cod, and the bream and a very odd redfin. There was less cod there than at Nug Nug. What type of cod? Very few Murray cod, mostly the other type, the rock cod. I am absolutely sure of that, an odd Murray cod and fairly regularly the other type, but I wouldn't say that the cod were thick on up there, though I was told at the time that they had been common in the past, that cod and bream had been caught in the bottom of the Catherine River, on the station. That was back during the Great War that the cod were common up there. When I was up there we didn't catch a lot of cod, you'd catch them in with the trout. The old trout up there kept most of the other fish away they are a cannibal and not fussy about what they ate. We'd catch most of the big trout up there by setting a greasy on a line.

The old trout took over the top end of the Ovens too. When I was young I heard of them catching cod right in Bright, the last of them, and past there. There was a cod hole up near Germantown, they were gone when I was about, but they were still getting a few a bit before. And in the Buckland. I never fished the Buckland, but the older blokes were talking about it in the past years, the early 1900s, up around the old diggings, they caught quite a few, and they still caught a few in the bottom end, it was a good clear stream. That was in the 20s when they were still catching cod there, when I was a boy and they were talking about it, I'm certain of that. The highest up I saw cod caught myself was at Porepunkah, in the 30s, by then they were getting scarce up there. I saw a couple caught there, and they were rock cod, I wasn't fishing up there much, more further down the river, but I saw the fish, I know what they were.

The bream, pound and half to two pound was the average, you'd catch them on worms, 3 to 4 pound was a big one, they weren't a very big fish. We'd catch the bream in the King, around Docker and Moyhu, and in the Ovens, in the early days they were caught right along the Ovens, anywhere, up past Bright, as a boy I heard of them being nearly up to Harrietville, and in the Buckland up to the diggings. The bream were getting scarce by 1945 to 50. There was still a few round in the little shoals, but they had disappeared too. The greasies were everywhere, bloody greasies, they were very sweet to eat, they'd get a foot long, in the Ovens, the King, in a lot of the backwaters, if you caught one greasy you caught ten. We'd catch them later on for bait out of the Hurdle Creek; you'd catch them as fast as you could throw a line in.

The yellowbelly, well I never, ever saw a yellowbelly, at Everton, Gapsted, the King, never saw one. And the grunter, I never caught one myself but I did hear from time to time of blokes catching a few around Everton, but I never saw one. That was in the 30s that they caught them, never heard of them after that. I remember the

Catfish well; if you got a 4 to 5 pound Catfish you'd think you had a 20 pound cod on, Christ they could fight! You'd catch them anywhere round the lagoons, there were a lot in the big lagoons around Whorouly, and I know they got them at Everton, Moyhu, Myrtleford, as far up as Porepunkah in the lagoons. That was back in the 30s. They were good eating. My mother was a good fisherman, she would get them out of Whorouly Creek when we were small, she would always be cooking Catfish. Yes, they were in both the King and the Ovens, in the backwaters in those rivers. The Catfish disappeared, a fair bit of my married life, after I married Alice, I never caught one, they went quick, never caught one after about 1932, before that you could always catch them in the Whorouly Creek, it was a reedy creek, ideal for them.

When we moved to Gapsted in 51 the fishing had changed. It was still good for cod, less of them but big ones. The rock cod were still around, though not as common, and the bream were by then a bit unusual. But it was still good fishing. I caught a 112 pound cod at the Pioneer Bridge at Everton back in the early fifties and plenty of 60 to 70 pounders. The big cod we'd get on the silver carp, and the red carp, we'd drag them out of the lagoons, not the mongrel carp you'd get now.

OH 99

Gary Daws of Rocky Point was interviewed in January 2007 at an age of 56 years.

I was born in Echuca, grew up at Gunbower, mum's family grew up around Gunbower. My old man was a fanatical fisherman and so was my mother. I came here in 1969, the first fish I ever caught here, on a celta spinner, was a 9 pound Murray cod. It was my revelation; I thought it was trout water! I got to know a lot of the old blokes that fished this stretch, heard their stories. There was very few fishing for cod in the 70s, we more or less had a hole each, there was three of us from here to Rocky Point. The river has changed that much, its static level has dropped maybe 4 feet. It's silted a bit, but the summer levels are lower. Back then, when I first came here, there were less cod but they were bigger. About 1983 there was 43 cod taken out of one hole in one season, the Rocky Point hole, that's when they started to get more common. The 74 flood did a lot of damage to that hole; it widened it, the gravel washed out of the banks. The 93 flood exacerbated that, it removed a lot of structure out of the main part of the hole and it silted up further down.

Below Rocky point my father-in-law, Pam's father, Abe Phillips; he always had a drum net in near a big log. He said at times he would curse this drum net because he was trying to get cod and it would be full of small grunter. That would happen only at certain times of the year. That would be back in the late 20s and early 30s. They weren't Macquarie perch, he knew the difference, he caught them as well. I caught one down here at Rocky Point 2 years ago, a grunter; he was as black as ink. As late as the early 1950s there were Catfish here in the lagoons at Rocky Point, old Abe told me. There was a lagoon that ran through an old fella's property here in the paddock near the road; they were common in that lagoon, that was the last place. He said as the redfin became more prolific the Catfish just disappeared. I never remember about anybody telling me about yellowbelly here, Macquaries and grunter yes, as well as the cod. The population of Blackfish here was phenomenal.

My mother in law was born and bred at Dandongadale. She told me that the most prolific fish in the Buffalo were the Macquarie perch, but there were cod up there too. That was pre-World War 2, in the 30s. There are some now up the river, well above the scout camp. I camped up there 2 years ago and in the decent holes there were decent maccas in them. They would follow the lures, but wouldn't take it, the best one would have been 3 pound. I walked up to Camp creek and they were right up there. Just before the dam was built, there were maccas still in good numbers in the upper Buffalo. Old Sam Lewis talked about all the cod that were in the Buffalo before the dam.

The biggest Silver perch I've seen, my old man got one that was 9 pound, out of the Murray, below Torrumbarry, for my sister's wedding in 1959. I'll never forget it, I had all my worms taken by the little ones, and he got this huge thing! It was good eating, how you handled them was important for the eating. When we were kids we would fish on the sandbanks there, we would mainly get Silver perch, they would knock off the worms, but we also got yellowbelly and small cod. The Silver perch, the little ones were shocking, there was so many of them!

My old man caught a lot of cod below Torrumbarry, but 3 or 4 times he caught a bluenose. I can remember him saying it to me, he was pretty much matter of fact about it, that was in the late 50s. They were there, but not in numbers, they knew what they were, but they were not commonly caught. I remember the first one I saw him catch, he couldn't get this bloody thing up, it was close to 30 pounds. He would get it up near the boat, it would go back straight to the bottom, it just wouldn't give up. The bluenose, they wouldn't capitulate at all, he was sometimes disappointed because they weren't as big as he thought they would be. That was a phenomenal fish, the others he caught there would have been under 10 pound. They put them here in the Buffalo Creek and at the time there was a lot of poaching and spotlighting that went on, they got them.

The old man, he would drag chains over the logs to wake up the cod, and then drag the area with an aeroplane spinner. He caught one yellowbelly, trolling for cod on an aeroplane spinner, about 1958, it was like a giant football, it weighed 34 pound. That was around Katy Malone's Bend, about 5-6 kilometres below Torrumbarry, he liked that bend a lot. I don't remember catching Catfish then in the river itself, but near Master's Bend there was a creek or a channel that always had Catfish in it. It ran into Pig swamp. And the Gunbower Creek always had Catfish in it; they were easy to catch with a beer bottle, a bit of string, a worm dropped off along the edge of the cumbungi. They were generally about 1 – 2 pound, got an odd one up to 4 pound. They are just the best eating!

OH 100

Wally Mitchell of Mongans Bridge, formerly of Dandongadale was interviewed in July 2007 at an age of 74 years.

I'm 74 years old, bred on the Buffalo, about 5 miles up from where the dam wall is now. The fish well in the past I knew from my parents they used to catch plenty. The cod they used to go right to the top of Abbeyard. My father was with the CRB when they pushed the first road up into Abbeyards, there was a hundred and thirty men, he told me that they caught enough cod there to feed all the men, in one night. It really is a small river, so it tells you how common they were. That was about 1920 odd. The 39 fires killed a lot of cod, nearly killed all of them. I can remember the cod floating down the river, big white bellies. The largest cod that I caught was 30 pounds; nearly all the fish caught was with a single propeller spinner with white feathers over triple hooks.

The bream were common, we used to stand on the rocks, would drop our lines down, nothing fancy like the nylon lines these days, just a hook and green line and a worm. There was a crack in one rock, where it went straight down, you could see the bream hiding in there. The bream, we used to get three to four pounders, they were beautiful, very deep fish, and pretty good to eat. The average size of the bream I would put down to ½ to ¾ pounds. The bream were up at Abbeyard and I think they went up a lot further. The slimies, oh yeah, there was a lot of them. I caught one 18 inches long; I thought it looked like an eel. They were sweet, heaps of them, most weren't that big, about 6 to 10 inches long. You don't scale them, just straight in the pan. I cannot recall any Catfish in the Buffalo and never heard anyone mention them. We caught bream and cod in the summer and early autumn, the bream during the day and evening and cod in the evening. The best time was when there was a storm brewing with lightning and thunder

There was heaps of trout, we used to go down and get a feed anytime. I remember we went down to the Nug Nug picnic about eight miles away, everyone did. While we were away some people came to our big rocky hole and blew it up. When we came home and milked the cows we were having tea and we heard a truck pull up at the bridge. We did not know what had happened until the next day as that is when we found all the dead fish in the hole and they kept rising to the surface for a week. They blew the whole lot up, well the trout the next week there were 3 to 4 pounders floating up. We never found any bream which was very strange as there were a lot of them in there but we never caught any more in that hole again.

The Rose River was never a brilliant river to fish in, in summer it turns into holes, full of leaves and stops running. The Dandongadale was a better river used to get trout in both, it kept running, also the Buffalo River. My cousin Lawrence and I were fishing in the Buffalo one day. We chucked our lines out and was having lunch when we both got a bite. We both had a fish on. The trouble was we both had the same trout on! He got the big cod in the newspaper where the Rose ran into the Buffalo. By the time we got flooded out by the dam, the cod they were really coming back. I got a 25 pounder and a 15 pounder on a cod spinner one night. We got flooded out by the Buffalo Dam and had to leave, otherwise we would never have left.

OH 101

Bing Kneebone of Whorouly was interviewed in December 2006 at an age of 76 years.

I can remember old Dave Brown, an ex-butcher, used to bring the cod home on a pushbike, used sparrows for bait. He would get them with a shanghai, then pluck them. That was out on the river here, at Whorouly. In the Whorouly Creek, it used to be full of Catfish, in the 40s; we used to catch them, used to get them up to 5-6 pounds. They were plentiful, common around 3 pound, that would be a good average size. And the bream, in the creek too, the Macquaries, before the redfin got in. We used to catch the bream, catchem around 2 pound, under the Willow trees with a floater and a Stringybark sapling. Got odd ones up around 3-4 pound, they were bloody good eating! After the bushfires, well it wiped both of them out, and the redfin. The big rains after the fires washed in the ash, the fish were swimming on top of the water gulping for air. Once the reddies got in they seemed to wipe everything out.

We used to catch the little greasies, stacks of them, up to a foot long. That's in the creek, and I caught a few cod out of it too, you only got them out of there up to 8-9 pound, though old Sherridan got a big one in Basil's hole. Jack Dick from Wangaratta got a Murray cod that was caught up in the mesh of his gate, during a flood. That was a good story! I've never ever caught yellowbelly here in the past, I fished the Ovens a lot, it was only 4 to 5 years ago I caught my first one here. In the old days you never saw them up here, further down yes, a few, but not up here. We caught an odd yellowbelly around Wangaratta. They used to go behind the showgrounds in the old days on the sandbars and caught good yellowbelly.

I once got a 76 pound Trout cod, years ago, below Yarrawonga; I wasn't too sure what it was. I showed the photo to Pat Sheridan, the inspector, and he identified it. He told me "You should know what they are, they're in the Ovens!" Before they put the Buffalo Dam in, they used to get a lot of cod up past Dandongadale. Years ago they pulled the big old snags out. The old holes, below the bridge here, they filled up with gravel, now you can walk around it.

OH 102

Geoff Holt of Beechworth was interviewed in October 2006

My father (Roy Holt) *knew that there were two types of cod, but believed that only the one type, the Trout cod, was present in Lake Sambell. His biggest was a 50 pounder, caught around 1952. In the morning he caught one that was 21 pound and went back that night and caught the big one. He caught good ones every year, always caught some from 20 to 30 pound each year. He fished for the big ones, and always caught them on bait such*

as yabbies or worms. The smaller ones were good to eat, but that big one he sold as he thought it would be too fatty. There are still cod in the lake, in the last few years I know of someone that bumped into a big one when they went diving in there.

Back in Lake Sambell in the forties and into the fifties there were mainly the Trout cod and the greasies. We would occasionally catch small cod that we threw back. They did put trout in but they never did any good, there would only be a few caught. When we were kids fishing in the lake there were no redfin, they would have arrived sometime in the fifties. He used to get the Trout cod in other places, he did catch a lot at Docker out near Moyhu, that would have been in the mid to late forties, he caught a couple of nice ones there that would have been in the twenties (pounds)*. Back then he had an old Dodge car; we had to push it all the time to get it started. He used to catch Trout cod down between Everton and Tarrawingee on a property that would let him in, they were anything from 8 pound on. There was a few Golden perch caught there, up to about 3 pound. The Macquarie perch by then were scarce; I don't recall catching a lot of them there. The redfin were explosive in the late forties and early fifties, at Brimin, in the Ovens. We got sick of catching them, even though they were good eating, you would have two hooks and you would get two of them. Now you hardly ever see them.*

OH 103

Allan Holt of Beechworth was interviewed in October 2006.

The biggest Trout cod my father got out of the lake went just over 50 pound. He had got one 21 pound that morning and got the big one that night. He said the cod in Lake Sambell were Trout cod, he knew about them because he used to go to other spots to catch them. We used to go camping with our father on the Buffalo, camp at Abbeyard, and further down. He used to catch both trout and the Trout cod together up there in the Buffalo, that would have been in the late forties. He also mentioned I think catching Trout cod up at Cheshunt, but that would have been a long time ago, and that he used to get a few Trout cod at Peechelba, but mainly Murray cod there. That would have been the early forties when he talked about catching them there. In the sixties he fished the Kiewa, that was the Murray cod he got there. And Brimin on the Murray, he said he caught a few Trout cod there, but mainly Murray cod. He always said that in most places you got mainly one sort of cod or the other, that one would dominate. The only place he ever talked about catching good numbers of both Murray cod and Trout cod was at Cobram, you got the two types of cod together there.

OH 104

Lance Jervis of Beechworth was interviewed in October 2006.

As a teenager I fished in Lake Sambell. We caught numerous small cod in the lake fishing with worms and wood grubs. They were around half a pound or so. That was in the early fifties. We just called them Murray cod. I remember Jeff and Allan Holt's father, Roy Holt, catching big ones out of the lake, certainly up to 50 pound and other big fish. The lake used to supply water to the tannery on the other side of town. There was a tunnel under the town that drew down the water. About 1960 the creek was diverted into the lake, to keep it full. It was about then that the small cod disappeared.

OH 105

Joe Krauss of Beechworth and was interviewed in October 2006 at 52 years of age.

I saw a cod caught in the lake about 36 years ago, it was weighed and was 68 pound. There were odd ones caught from time to time. About 1969 they were floating in the lake dying and blown up, but not dead. That was about the first time I ever saw them, floating to the top upside down. The theory was that the Trout cod hadn't been able to spawn for a few years and it killed them. They were still alive when we dragged them out, many of them 25-30 pounders at least. We must have dragged about 40 out of the water and hung them up in the trees. There were dozens and dozens of them.

Prior to that I hadn't caught a cod, though I had been broken off a few times, got towed around. There have been a few photos of them in the local newspaper, the Ovens and Murray Advertiser. The last one was at least 15 years ago. It was caught by John Rutten and was 16 pound. There was a report of two small ones caught recently, in the last few weeks.

OH 106

Tom Knox of Wangaratta was interviewed in October 2006 at 93 years of age.

I was born in Wangaratta, on the river, in town. The bream were in plague proportions. Back then they weren't known as Macquarie perch. In the early morning you could see them swimming around. You could catch them on worms, any amount off the sandbanks. There wasn't a lot of interest in them. That's 70, maybe closer to 80 years ago. They were up to a couple of pound. And they used to go right up to at least Whitfield in the King. I caught them up there. We were coming back from trout fishing and we pulled in at Fletchers Bridge on the Buffalo. You could see the bream swimming around in the rock holes above the bridge, near where the Buffalo dam now is. The water was that clear, you know it was the mountain water. They wouldn't come near a line with a sinker. We threw in lines with worms and they would suck on it and you wouldn't see the line move. We caught three or four up to about 2 pounds. Went back a few times, but they were hard to catch.

The Catfish were here, in the big lagoons. There is none left of those big lagoons due to all the levy banks. There was plenty of them, up to 2 ½pounds, but none since I was young. I used to fish the Horseshoe lagoon in the police paddock here. We had beer bottles with a cork in them with a line, baited up with worms. That's how we caught the Catfish. The grunters were in the Ovens. They were around, but not very common. If you got one you got a few. They were up to about 2 pound. They just disappeared. I used to catch them at the lock at Torrumbarry, you could fill an icebox with them, but they weren't much good to eat. The yellowbellies, well we never caught many in the river. There were more yellowbellies in the lagoons. There's more now in the river from the stocking than back then when I was young.

The cod in the Ovens they went up to at least Myrtleford. There was plenty of them up that far. And they went right up the King to Cheshunt, though not as common as further down. My best cod out of the Ovens was 90 pound; it was taken by angling on a bardy grub. That was back about 1980. When I was young there was plenty of them, plenty of big ones. We used to set lots of night lines back then, that's how we got them. We'd go down the river with 30 set lines. Back then you hardly saw anyone on the river. Not like today, there are boats everywhere! Got a few 40 and 50 pounders. I had the first motorboat, had it out at Bundalong. When Mulwala first filled, for the first 5, 6, 7 years, I used to go out with the old propeller spinner. That's the aeroplane spinner. You had no trouble catching 14 – 20 cod a day. They were all the normal Murray cod. We got the Trout cod in the river here, though we didn't call them that back then. We just thought they were some funny looking cod, a strange cod. I might of heard of them being called a bluenose. They certainly had a blue colour about them. They were not as common as the Murray cod. The biggest ones were about 9 or 10 pound.

When I was young there were no redfin back then. The first redfin I saw was taken from the 3-mile creek. It was on display in Lindner's Jewellery store when I was a kid. It was in a jar in a window with a label, "English perch". It was a novelty. Then they exploded, they took over everywhere.

OH 107

Don Burrowes of Claremont was interviewed in August 2007 at an age of 81 years.

I'm 81, been on the King River all my life. I grew up on the last place on the eastern side way up the King, about 4 miles before where the dam is. It was the late 1800s when my grandfather Ted Burrowes settled up there, then my father Frank Burrowes took the place on. The cod they were up there before my time. My grandfather told me he used to go up there above where William Hovell is and catch cod. About half way between the dam

wall and Evan's Creek, it was called the 'Gun Hole'. Apparently somebody dropped a gun in it and they couldn't find it, it was a deep rocky hole, and very dark. He told me they were common there, cod and bream, and good cod up to twenty pound, but not big. The cod, there was plenty of them; there was no need to travel they could catch them there and right down the river to our home, any amount of them. From what I remember they caught them up to 40 pound at home, they didn't have to go any further to get them. When they introduced the trout in 1903 he said it pushed them out, he had absolutely no doubt about it, it was pretty quick. He said they released the trout in the early 1900s and they took over. And took over they did well, it was suggested that the King River was one of the best trout streams in Victoria. I've always been a trout fisherman but it's just a plain fact, the trout pushed the cod, and the bream, out of the top of the King.

I started fishing when I was 6 on our property, I can remember it. All I had was a bamboo pole and a piece of string and a hook. It was baited up with a wood grub and I caught a trout of 2 pound. We only lived a 100 meters from the river. By my time it was nearly all trout. When I was a boy we did catch an odd cod after the trout were put in, every 4 or 5 years. Never saw a bream there, by then they weren't much up past Whitfield. There was a lot of slimies around. For night fishing we used to use the slimies for bait. They are still here but not so thick as back then. My mother talked about catching the Blackfish in all the creeks on a bent pin. The frogs used to be around then, we used to light a big fire, put a frog out, and all of a sudden there would be a tug, tug with a trout on the line. It took us a while to work out that the trout used to take the frog down the hole before he'd swallow it. Now you don't see the frogs at all.

There was a lot of bream caught from Whitfield north and a lot of crays. When I was fishing up until the 1940s there was a lot of crays in the river, they were right up to the 'Top Crossing', and above. I used to go up there and catch beautiful trout, early on there was a lot of rainbows, used to catch them on the fly. In the grasshopper season they'd go on them, but they were fussy, if they were feeding on the brown grasshopper that's all they would take. You could put a green grasshopper on your hook and they wouldn't look at it. You could see big browns, up to five pound, lying in the pools. The Dandongadale was another good stream, but the Rose it used to stop running, fill up with leaves.

Later on I moved down the river to here. The Catfish were here in Moyhu, they used to catch them in this lagoon here (Claremont)*, the Gibb family my parents in law talked about them, way back in the 1880s then there was a flood and the river changed course. I didn't catch them but others did. About 1948-50 I was driving a school bus and we used to catch beautiful redfin about 2 ½ pound round Targoora, in behind Webb's place. You don't hear of them now. But the cod are here they're catching them and the Trout cod.*

The river well in the 1950s they put a bulldozer in the river here from the top end all the way through, pulled the snags out. The next flood filled the holes in. It used to take a flood 4 days to get to Wangaratta, now it takes half a day. The tobacco growers used to wash the bag that had the DDT in the river. And there was the other chemicals. Years ago I used to go fishing up at the 'Top Crossing', up around Pineapple Flat and you would see all the grasshoppers, now you hardly see them. The access has allowed a lot of people to get up to the breeding streams for the trout and there is no stocking.

As far as the fishing goes if they're going to bring the natives back then they should do it properly. Stock the King properly with the Trout cod and the bream, put the snags in and fix the river. I've always loved my trout fishing but I'm for them bringing the cod and bream back to the King as long as they create good fishing for them. The way it is at the moment we don't have good fishing for the trout, and the native fish, the Trout cod and the bream they're protected.

OH 108

Max Suffield of Moyhu was interviewed in December 2007 at an age of 78 years.

I was born, sired there in Tarrawingee, I'm 78. My father, in the Ovens, my father caught both the Murray cod and the Trout cod. The Trout cod he called a 'King cod'; because he said there was a lot of them in the King, more than the Murray cod, that was in the 1930s. I caught them myself, oh hell yes, back in the 30s from when I was 5 or 6 years old, at Tarrawingee, and Yellow Creek, they were in there, and at Targoora. We'd go out on pushbikes, there was a lot there. We didn't weigh them, and we never caught little ones, they were up to about 13 pound. They got scarce but never died out of the King, there was odd ones around till they started stocking them. We come here, in Moyhu, in 1969 and there were very odd ones being caught.

The bream, we caught in the Ovens at Tarrawingee and at 'the Walnuts' in Wang, they'd be most about a pound, we never caught big fellas, if you caught one you caught a dozen. The yellowbelly, there was only the odd one where we fished; there was a few more down the river below where we used to go. The grunter, never saw one out of any of the rivers when I fished. The Catfish we caught a few, not many, in the Ovens, mainly around Wang, we used to catch a few in behind the Sydney Hotel. The redfin were common when I was a boy, you could catch them anywhere, rivers, creeks, private dams. When it flooded they'd be in the holes in the paddocks. The best bait for them was a bit of redfin.

Dad caught a big Murray cod in there, at the Sydney Hotel; he was as poor as a crow. He opened his mouth, and he had a turkey bone stuck in his throat. He'd been feeding on all the scraps from the hotel. Dad tethered him up there for three months; he kept feeding on the scraps, and fattened him up. We used to always tether our cod, the Murray cod they were up to 30 to 35 pounds. Dad once got bit by a tiger snake and he set it up on a line for a cod. He spent the night in hospital. When we checked the line it had been bitten in half! There used to be a lot of snakes around then. Then they started getting ticks, that seemed to have killed them off. A neighbour got one the other day with a tick on it.

We moved up to Cheshunt when I was 16, so I can't tell you about the Ovens after that. In the King I was told that in the early days there were cod right up the river, they were in the 'Bog hole', about 4 miles down from the 'Top Crossing', that was in the gold rush times, that was about 12 miles above William Hovell. It's up further than the 'Gun hole'. It got its name from the carts getting bogged near there; on the bridle track. They never quite finished the track because the railway opened. When we came to Cheshunt there was only trout. Dad and I were always putting lines in, at night, with bardy grubs on them and we never caught a cod, only trout. If they were there we would have caught them, we were always fishing. Other people did catch cod, just below the bridge, but they were few and far between. And the bream, some people were catching a few at that time at Whitfield, only a handful, but we never caught one at Cheshunt.

OH 109

Len Maples of Cheshunt was interviewed in July 2007 at an age of 65 years.

I'm 65; I grew up in Griffith, moved to this part of the woods in 1960. I fish the King; I know every hole from Lake William Hovell to Moyhu. I've caught cod in between the Gentle Annie Bridge and the Cheshunt Bridge in recent times. They've been 50/50 Murray cod and Trout cod. We used to fish the 'bidgee, back in the 50s; the majority of the catch back in those days was Silver perch and redfin. I remember my dad caught a 4 pound cod and he thought it was a red letter day! We used to get the odd yellowbelly too. I was friends with a local bloke, Jim Skins, who just passed away recently. Jim was in his 80s, he grew up in Whitfield. He said as a kid he would sometimes catch the Silver perch in the King at Whitfield. That was the grunter he was talking about, not the Macquarie perch. The trout fishing used to be good; there was monstrous trout in the King 40 years ago. My father in law lived on the Kiewa River; he talked about the 39 fires. They had a monstrous storm up there, the river turned black, it killed everything.

In the King now the majority of the Trout cod are small; I have caught one that would have been legal size for cod. Last year I caught 32 cod here, I use lures, rarely use bait these days. The majority of the Trout cod were twelve inches long. The biggest Murray cod was 14 pound, another four were legal and around 8 pound. Of the 32 cod I caught last year 10 were Trout cod. On the opening day, the first of December I caught 5 cod in 7 casts from my favourite hole, one was a Trout cod. I was fishing just downstream from Gentle Annie. The Trout cod are so aggressive. A couple of years ago I was fishing in this hole, there was a log in front of me, I flogged this hole with a lure. I threw this lure out about a foot inside the log, and this Trout cod came out and followed it to the bank. I stopped it, it was 2 or 3 inches from it, one turn of the reel and it had it. It was sheer aggression.

13 Broken River Catchment

NORTHERN BLACKFISH.

Noting J. T. Anderson's remarks on the subject, "R.G.K." (Richmond) says that he has just had a fortnight's fishing in the Broken River and various creeks around Lima (via Benalla). Although he had good sport with Murray cod, bream (Macquarie perch), and catfish, which he remarks is a far finer table fish than is generally realised, he noticed, too, how numerous were the blackfish. He must have hooked over a hundred, but returned them all to the river, as according to the Game Laws, they may not be kept under 8½ inches, and very few of these were eight inches, many as small as four inches.

Had "R.G.K." known, he might have kept these fish, because an exception is made about them. The regulation reads:—"Blackfish, except those in streams flowing north from the Great Dividing Range, 8½ inches." These blackfish are a smaller species or variety, and the Fisheries department imposes no conditions in regard to them.

Argus, 15 January 1924

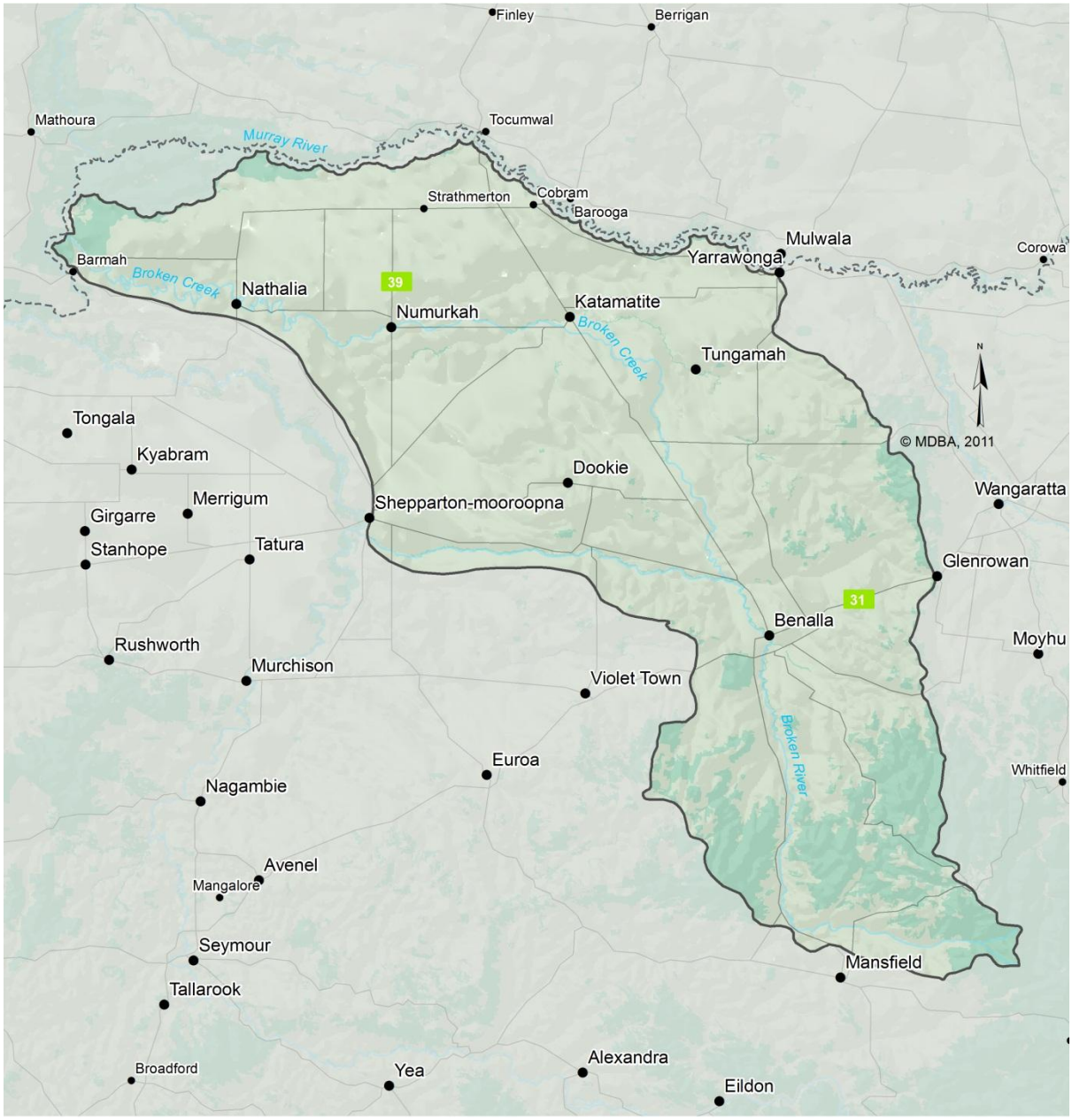
NORTHERN BLACKFISH

Noting J. T. Anderson's remarks on the subject, "R.G.K." (Richmond) says that he has just had a "fortnight's fishing in the Broken River and various creeks around Lima (via Benalla) Although he had good sport with Murray cod, bream (Macquarie perch), and catfish, which he remarks is a far finer table fish than is generally realised, he noticed, too, how numerous were the blackfish. He must have hooked over a hundred, but returned them all to the river, as according to the Game Laws, they may not be kept under 8 inches, and very few of these were eight inches, many as small as four inches.

Had "R.G.K." known, he might have kept these fish, because an exception is made about them. The regulation reads:- "Blackfish, except those in streams flowing north from the Great Dividing Range, 8 1/2 inches." These blackfish are a smaller species or variety, and the Fisheries department imposes no conditions in regard to them.

Argus, 15 January 1924

Figure 13.1 The Broken River Catchment showing major waterways and key localities.



13.1 Early European Accounts

The Broken River rises at the foot of Mt Buller north of Mansfield and, travelling west, collects water from tributaries originating in the Strathbogie and Wombat Ranges. After passing through Benalla the Broken flows northwest, splitting into two primary watercourses, the Broken River which discharges into the Goulburn River at Shepparton and the Broken Creek which enters the Murray River near Barmah.

On November 29, 1824 Hume and Hovell camped at the Broken River near Samaria. They apparently did not consider the waterway to be of sufficient significance to give it a name. It also appears that they did not fish the stream, or if they did they made no record if they encountered fish in it (Bland, 1831). On October 13, 1836 Major Thomas Mitchell camped on the Broken River near the present site of Benalla, simply recording the waterway as the 'Swampy' (Mitchell, 1838). In 1838 Grantville Stapylton, who was second in command of Mitchell's expedition, named it the Broken River, probably because the course of the river was broken up into ponds (Neil McQualter, pers. com.). The Broken catchment developed with time into a premier grazing region, the gold rush largely bypassing the area save for relatively minor workings such as those on the Ryans Creek (Flett, 1979).

Few historical accounts have been previously reported of native fish in the Broken catchment. John Langtry, in his post-World War Two survey of the inland fishery, mentioned the reputed abundance of Macquarie perch in the Broken River (Cadwallader, 1977). Many thousands of juvenile Macquarie perch were sourced from the Broken River for translocation elsewhere between 1935 and 1962 and, in 1962, about 100 small Macquarie perch were relocated from the Broken River to Boosey Creek (Cadwallader, 1981).

13.2 The Past Distribution of Fishes in the Broken River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the Broken catchment into a lowland zone (downstream of Swanpool), a slopes zone (upstream to Barwite) and an upland zone beyond the latter location. Only a few headwater creeks exist in the montane zone. Slopes type habitat, identified by the presence of confined valleys with streams containing extensive coarse gravel and sand substrates, extends further downstream to the Yin Barun/Mollyullah area. The slopes zone is therefore treated as existing down to these locations in this discussion. Apart from the slopes/lowland zone boundary, the habitat zones discussed below match those in the *Sustainable Rivers Audit.* The native fish rarity scores developed by the expert scientific panel that were used in the audit defined two types of habitat namely a lowland zone and a second merged habitat consisting of the slopes and upland zones.

Most of the information presented below is sourced from oral history (mainly OH 63, 110-113, and 115) and a few newspaper accounts. In addition, local historian Redge O'Connor sourced information from 97 year old Frank Cook during the last weeks of Cook's life, in reference to the Benalla area fishery in the 1920s. Also included are anecdotes provided by the late Laddie Clifford, a professional fisherman from Barmah, to the author in the 1980s about the lower Broken Creek. Very few old photographs of catches of native fish in this catchment have been located though one is of significance. It is recommended that further historical research be undertaken in this catchment, particularly along the lower reaches of the Broken Creek.

13.2.1 The Montane Zone

Only a few small streams penetrate into the montane zone of this catchment and there are no records of larger native fish being present.

13.2.2 The Upland Zone

Oral accounts indicate that cod and Macquarie perch had been present in the upland zone of the Broken River at least as far upstream as the Stockyard Creek area. A first-hand account from Frank Moore, originating from the 1940s, recalled that small numbers of fish were being taken on each outing. Frank, while familiar with the two cod species, could not recall with certainty what type of cod was taken (Moore, OH 115; Frank Moore, pers. com.). By that time major declines in native fish populations had been reported further downstream and a similar situation probably applied to the upland zone. Old stories indicate that cod and perch had been common in the upper Broken River (O'Connor, OH 111; Redge O'Connor & Ambrose Doxey, pers. com.). The limited evidence suggests that cod and Macquarie perch had been at least fairly common in the upland Broken River. There is no clear evidence indicating what species of cod were present in this zone but as both Murray cod and Trout cod were reported further downstream it is likely that both species were present. Blackfish were also common in the upper Broken River (Frank Moore, pers. com.).

13.2.3 The Slopes Zone

Cod were common in the upper reaches of the slopes zone above Barjarg where some fairly large fish were taken (Doxey, OH 110; Ambrose Doxey, pers. com.), were very common in the Broken River in the Nillahcootie area, near Lima (*Argus,* 15 January 1924) and common in some of the larger creeks, including the Hollands and Ryans Creeks (O'Connor, OH 111). Stories from a number of residents, including Frank Cook, recalled that cod were present in the lower reaches of both the 'Back' and 'Little Back' (Wild Dog) Creeks at Nillahcootie (O'Connor, OH 111; Redge O'Connor, pers. com.). Upstream of Benalla both cod species were taken and old anglers told Ambrose Doxy that 'bluenose' (Trout cod) had been common in the early years of the twentieth century (Ambrose Doxey, pers. com.). The available evidence suggests that both species of cod had been common in the Broken River and larger creeks of the slopes zone and were present in some small creeks.

Macquarie perch were abundant in the Broken River in the Williams Bridge and Barjarg areas (Doxey, OH 110; *Argus,* 15 January 1924) and in the Hollands Creek near Tatong, the Ryans Creek near Mollyullah, the Back Creek (O'Connor, OH 111; Redge O'Connor, pers. com.) and were taken from the Broken River near the Mansfield-Whitfield Road Bridge during the early 1980s (Author's pers. obs.). Blackfish were also very common to abundant in those streams (Doxey, OH 110; O'Connor, OH 111) and at times were considered a nuisance when fishing for perch (Redge O'Connor, pers. com.). They were abundant in the Lima area where, on one occasion, an angler reported taking in the vicinity of a hundred fish from the river (*Argus,* 15 January 1924). The oldest resident to provide information, Frank Cook, indicated that up to the 1920s Catfish had a presence at the bottom of the slopes zone in the Hollands Creek, upstream to Tatong, and further upstream in the lower reaches of Back Creek (O'Connor, OH 111; Redge O'Connor, pers. com.). A newspaper story supports Cook's account recording 'good sport' being had with several fish species in the Broken River and creeks near Lima. This sport included Catfish, and noted their superiority as a table fish, suggesting that they were regularly captured (*Argus,* 15 January 1924). There are no historical records of Golden perch or Silver perch in the slopes zone though captures of Golden perch have occurred in recent years. These captures are likely to have come from hatchery released fish. Based on evidence of their presence in similar habitat in the adjacent Ovens

catchment it is suspected that these two species had a minor presence in the lower reaches of the slopes zone of the Broken River.

13.2.4 The Lowland Zone

Redge O'Connor's recount of the memories of Frank Cook, as well as the stories from other anglers, indicates that that cod were common in some lowland creeks near Benalla including the Baddaginnie and lower Ryan Creeks (O'Connor, OH 111). In the early years cod were very common to abundant in the Broken River with fish up to 75 lb. (34.0 kg) being taken (Doxey, OH 110; O'Connor, OH 111). Further downstream at Nalinga, cod had been abundant (Jones, OH 112). An early newspaper account described very small cod as being 'plentiful' along the length of the Broken River (*Argus*, 3 July 1917). Large cod were common near Nathalia in the Broken Creek in the 1920s (*Argus,* 21 April 1925) and on one occasion three anglers captured 'fish weighing 35lb., 13lb., 9lb., and half a dozen between 3 and 4lb. in weight' (*Argus,* 1 February 1923). Cod were abundant in the Boosey Creek near Naring (Wallden, OH 113) and during a drought large numbers of cod were taken from the Boosey Creek in Tungamah, with fish up to 30 lb. (13.6 kg) being captured (*Argus,* 23 April 1902). Murray cod were also common in the Winton Swamp (Norris, OH 71) and in lagoons along the lower Broken Creek (Laddie Clifford, pers. com.)

Two records exist at the *Australian Museum* of specimens of *Maccullochella macquariensis* being captured from the Benalla area in 1890, but neither survives. It is unknown whether they were Trout cod or Murray cod (*Australian Museum* database). Ambrose Doxey regularly captured small numbers of Trout cod near Benalla prior to the Second World War, though considered Murray cod to be prevalent (Doxey, OH 110). George Jones, while never personally seeing the species when young, indicated that his father had talked about odd captures of 'rock cod', which he was certain were Trout cod, taking place in the past at Nalinga, and he caught specimens near Benalla after they were stocked in the 1990s (Jones, OH 112; George Jones, pers. com.). Bert Roberts was familiar with the species in the Murray River, and recalled only catching Murray cod in the Broken Creek near Devenish, in the 1930s (Roberts, OH 63). In the lower Broken Creek near Barmah, Trout cod were regularly taken in the 1930s but were not considered to be particularly common (Laddie Clifford, pers. com.). Confirmation of their original presence in the Broken River comes in the form of a photograph of a specimen caught by Keith Henderson of Harcourt during the mid-1970s, known with certainty to have been taken from the Broken River. The exact location of its capture is unclear but thought to be near Benalla (Photo BR1, Lyn Allan, pers. com.). Collectively the evidence suggests that Murray cod had originally been abundant in the rivers and larger creeks of the lowland zone while Trout cod were definitely present but, on the few available records, had been less common.

Macquarie perch were abundant in the Broken River at Benalla and the lower Ryans and Hollands Creeks, and were common in smaller creeks such as Baddaginnie Creek (O'Connor, OH 111). In the Broken River at Nalinga the species was also abundant with a typical catch consisting of five to six fish in an afternoon (Jones, OH 112). Lake (1959) mentioned that Macquarie perch were present in the Broken Creek, and a newspaper account specifically records Macquarie perch as having been present in that stream (*Argus,* 21 April 1925). In the 1940s they were regularly taken from the lower reaches of the Broken Creek near Nathalia (Laddie Clifford, pers. com.). Large numbers of 'perch' were reported in the Boosey Creek (*Argus,* 23 April 1902) but their actual identity is unclear. The Broken River was the source of many thousands of Macquarie perch that were translocated to other waters. In 1936 about 800 fish were reportedly taken from the Broken River near 'Violet Town' (*Argus,* 1 April 1936) and a Violet Town resident described small Macquarie perch as being 'plentiful' in the nearby Broken River (*Argus,* 8 January 1938). The closest point of the Broken River to Violet Town is at

Nalinga. In 1962 400 Macquarie perch were netted for translocation from the Broken River at Nalinga (Cadwallader, 1981).

Golden perch were regularly taken in small numbers at Nalinga (Jones, OH 112) while at Benalla they were caught, particularly after floods, but not considered to be common (Doxey, OH 110; Ambrose Doxey, pers. com.). Further downstream Golden perch were present in the Broken Creek (*Argus,* 21 April 1925) and were very common near Nathalia with fish being taken up to 13 lb. (5.9 kg) (Trefall, OH 132). They were abundant in the lower reaches of the Broken Creek near Barmah (Laddie Clifford, pers. com.). Golden perch were regularly captured but not common in the Boosey Creek near Naring in the 1930s (Wallden, OH 113).

George Jones recalled Silver perch as far more common than Golden perch in the Broken River at Nalinga when he was young, rivalling Macquarie perch in abundance (Jones, OH 112). They were regularly taken in small numbers in the Broken Creek near Devenish (Roberts, OH 63). One newspaper account indicates that Silver perch were originally common in an unidentified tributary of the Broken River (*Argus,* 15 May 1908) and large schools were present in the lower Broken Creek (Laddie Clifford, pers. com.). Ambrose Doxey could not recall capturing Silver perch in Benalla (Doxey, OH 110) and suggested that the absence of Silver perch and the relatively low abundance of Golden perch in the twentieth century at Benalla may have been the result of the Caseys and Benalla Weirs impeding their upstream migrations (Ambrose Doxey, pers. com.). The weight of the limited available evidence points to Macquarie perch having been the most abundant and prevalent perch species in the top half of the lowland zone, followed by Silver perch, with Golden perch being comparatively scarce. Golden perch steadily increased in numbers downstream, to become abundant in the lower half of the lowland zone where it appears that all three perch species were regularly taken.

Catfish appear to have been widespread and common, particularly in the billabongs and creeks. They were regularly captured in the Baddaginnie Creek, the lower Ryans Creek and Broken River near Benalla (Doxey, OH 110; O'Connor, OH 111). They were common in lagoons and Galls Creek near Nalinga (Jones, OH 112), and were abundant in the Boosey Creek near Naring (Wallden, OH 113). They were very common in the Broken Creek near Devenish in the 1930s, being taken up to a weight of three lb. (1.4 kg) (Roberts, OH 63) and were also originally abundant in the Winton Swamp (*Argus,* 6 December 1921). Blackfish were very common in the Baddaginnie and other small creeks near Benalla, and were taken from the Broken River itself (O'Connor, OH 111). At Nalinga they had been very common, with typical catches being three to six fish in certain locations (Jones, OH 112). Blackfish were abundant in the Boosey Creek at St. James, in the 1930s (Neil McQualter, pers. com.), the Broken Creek near Devenish (Roberts, OH 63) and in the lower reaches of the Broken Creek and adjacent lagoons near Barmah (Laddie Clifford, pers. com.). Overall Blackfish appear to have been very common to abundant in most habitats in the lowland zone.

13.2.5 Estimates of Native Fish Abundance in the Broken River Catchment at European Settlement

Presented are the rarity scores used in the *Sustainable Rivers Audit* (Davies *et al.,* 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 13.1 Broken River Catchment Rarity Scores (Main River Channels)

	Lowland* (Murray & Goulburn Rivers to Yin Barun & Mollyullah)		**Slopes*†** (Yin Barun & Mollyullah to Barwite)		**Upland†** (Upstream of Barwite)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod	5	3	3	3?	3	L3?
Murray cod	5	**5**	3	3?	3	L3?
Golden perch	5	3	1	L1?	1	0
Silver perch	5	L5	0	L1?	0	0
Macquarie perch	3	**5**	3	**L5**	3	3
Catfish	3	3	0	1	0	0
'Blackfish'	5	**5**	3	**5**	3	3

Key
0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

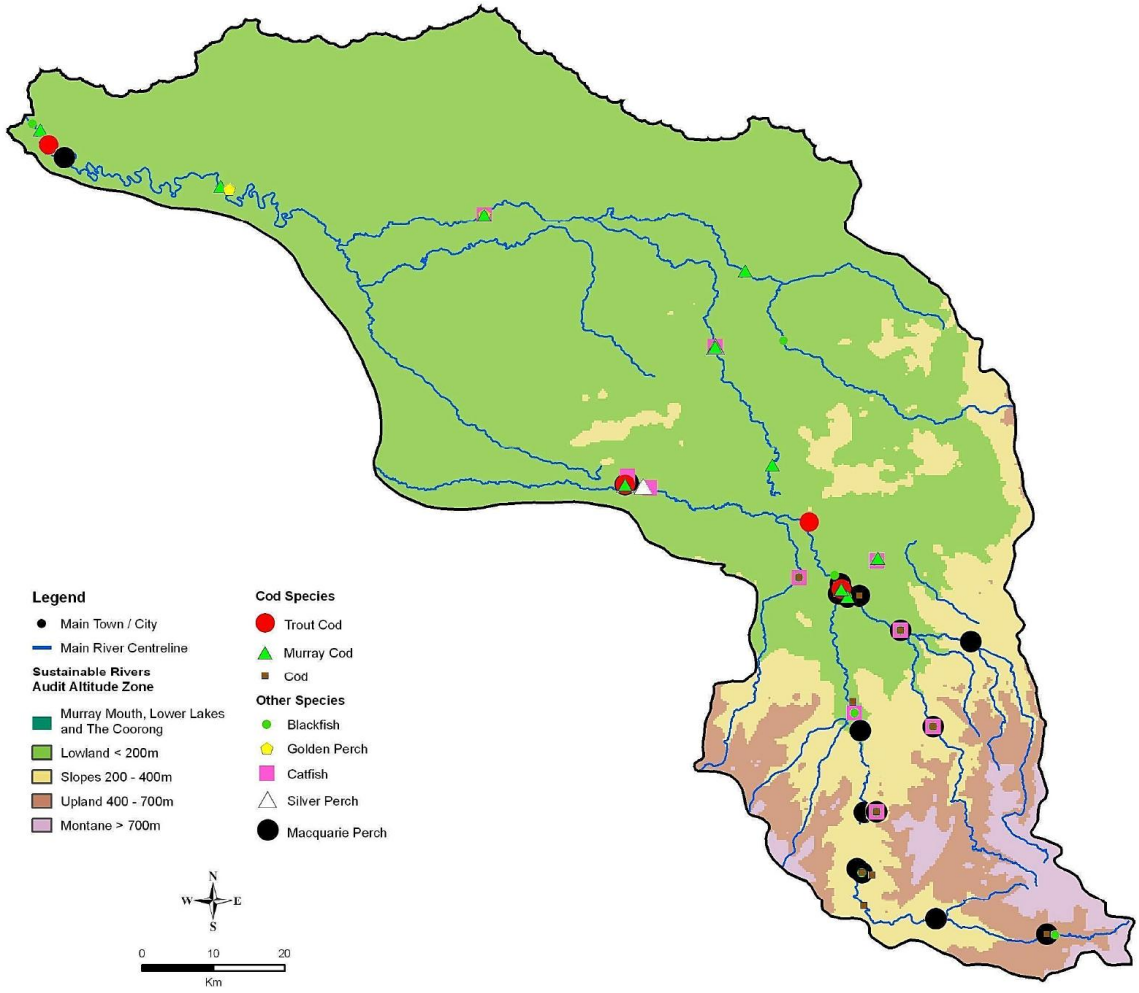
L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type supported by multiple accounts or lines of evidence e.g. Oral history, newspaper accounts, photographs.

* Note: Some of the boundaries used for this zone are at a lower altitude than those used in the *Sustainable Rivers Audit*

† Note: The *Sustainable Rivers Audit* utilised rarity scores for a combined slopes and upland zone whereas in this project these two habitat zones have been scored separately

Figure 13.2 Historical Records for all Native Fish Species in the Broken River Catchment.



Photograph 13.1 Broken River Trout Cod

Photo BR1: This Trout cod was caught by Keith Henderson of Harcourt from the Broken River near Benalla c1975 while attempting to catch Macquarie perch for his native fish breeding program. It was brought back alive and kept in an aquarium but died in a few days. The photo is significant for two reasons. Firstly, it is conclusive proof the species past presence in the Broken catchment. Secondly, it also demonstrates Keith's familiarity with the species and thus makes his accounts of the presence of Trout cod in the Campaspe catchment in the past reliable. Photo courtesy of Mrs Lyn Allan.

Photograph 13.2 A Huge Macquarie Perch

Photo BR2: This image probably contains the largest Macquarie perch ever recorded photographically. Tipping the scales at six lb. (2.7 kg) this fish was captured by Paul Berner from Lake Nillahcootie c1974. Specimens captured from Lakes Dartmouth and Eildon by scientists have exceeded three kg in weight whilst professional fisherman 'Laddie' Clifford of Barmah once informed the author that a number of eight pound specimens had been taken by professional fishermen in that area in past years. Macquarie perch once dominated the Broken catchment which was used as a source for translocations elsewhere. A relic population existed in the lake and the Broken River upstream to near Mansfield until the mid-1980s. Recent reports suggest it may still persist. Photo courtesy of Paul Berner.

13.3 The Changes

13.3.1 Changes to Native Fish Distribution and Abundance

In the upland zone significant numbers of Macquarie perch and cod were taken in the early twentieth century, but by the 1940s only a few individual fish were taken (O'Connor, OH 111; Moore, OH 115). Today the only large native fish that are present are Blackfish (Author's pers. obs.).

Cod were very common in the slopes zone in the 1930s but had become scarce by the 1950s, after which they were rarely captured (Doxey, OH 110; O'Connor, OH 111; Ambrose Doxey, pers. com.). It appears that during the 1930s cod populations started retreating downstream from the upland/slopes habitats. Trout cod were scarce in the area by that time and have not been subsequently reported (Ambrose Doxey, pers. com.). Macquarie perch remained abundant in the slopes zone in the Broken River until the early 1950s (Doxey, OH 110) and were common in the lower reaches of the Ryans and Hollands Creeks until the 1960s (O'Connor, OH 111), by which time a serious decline was evident. After the construction of Lake Nillahcootie in 1967, occasional captures occurred in the lake (Paul Berner, pers. com.; Photo BR2), and in small numbers each spring further upstream in the Spring Creek area, near Mansfield, during the early 1980s (Author's pers. obs.). Catfish have not been reported from the slopes zone since the 1920s (O'Connor, OH 111).

In the lowland zone some reduction in cod catches was evident by the 1940s and they had become scarce in smaller creeks near Benalla including Baddaginnie Creek by that time (Ambrose Doxey & Redge O'Connor, pers. com.). Cod remained common in the Broken River, though small fish were less prevalent, and a further decline was evident during the 1960s (Jones, OH 112). In the Boosey Creek cod disappeared after a large fish kill in the late 1920s (Wallden, OH 113). Trout cod, which had regularly been taken from the Broken River near Nalinga and Benalla in the early twentieth century, had virtually disappeared by the 1940s, with rare captures occurring up to the 1970s (Ambrose Doxey, pers. com.; Photo BR1). In the lower Broken Creek the species had disappeared by the 1960s (Laddie Clifford, pers. com.).

In the Broken River at Benalla and Nalinga, Macquarie perch, while still common, showed evidence of some decline in the 1940s. By the 1960s a serious reduction in abundance had transpired, with their virtual disappearance by the 1970s (Doxey, OH 110; Jones, OH 112; Ambrose Doxey, pers. com.). The oral history is supported by translocation records which suggest declining catches in the Broken River from the 1930s to the 1960s (Cadwallader, 1981). Similarly Silver perch became scarce at Nalinga by the 1960s (Jones, OH 112) and Golden perch had disappeared near Benalla (Ambrose Doxey, pers. com.). During the 1920s local anglers observed a decline in catches of Macquarie perch and Golden perch in the Broken Creek, this being associated with the arrival of Redfin perch in large numbers (*Argus,* 21 April 1925).

Catfish appear to have undergone a decline during the 1930s in the lowland zone, having been common up to the 1920s. Ambrose Doxey had not seen a Catfish at Benalla for over fifty years suggesting their scarcity since at least the 1940s (Doxey, OH 110). George Jones recalled his father's stories of Catfish at Nalinga but at 72 years of age had never himself seen one. George pinpointed a drought which he suggested as taking place towards the end of the 1920s as exterminating Catfish populations near Nalinga (Jones, OH 112; George Jones, pers. com.). Their disappearance from the Boosey Creek was also linked to a drought in the late 1920s (Wallden, OH 113). Neil McQualter of the Benalla Historical Society recalled that 'greasies' (Blackfish), which were common in the Boosey Creek, near St. James, when he was a boy in the 1930s, disappeared during the 1940s (Neil McQualter, pers. com.).

13.3.2 Changes to Habitat

Early photographs reveal that much of the habitat immediately upstream of Barjarg had been cleared of virtually all tree cover by the 1890s (eg, State Library of Victoria, H85.162/26; H85.162/86). Land clearing resulted in the mobilisation of large volumes of sediment which was transported down the Broken River (De Rose *et al*., 2003). Weirs were constructed on the Broken River along its course as early as 1890s, with Caseys Weir downstream of Benalla being constructed to divert water from the Broken River into the Broken Creek. A number were subsequently constructed along the creek to provide suitable holes for pumping and storing water for farming (*Argus,* 30 April 1895; Bassett & Latch, 1984; Wallden, OH 113). Caseys and Benalla Weirs have been implicated in reducing the abundance of Golden and Silver perch near Benalla by acting as instream barriers to fish movement (Ambrose Doxey, pers. com.). During the 1960s sections of the Broken Creek near Nathalia were dredged to improve drainage of nearby farmland (SKM, 1996). Tenders were called for the removal of snags from the Broken River in 1935 (*Argus,* 3 July 1935). Further 'river improvement' works involving removal of snags occurred downstream of Benalla in the 1960s, after which many of the deep holes filled with sand (Jones, OH 112).

While touted as early as 1909, it wasn't until 1967 that a sizeable water storage on the Broken River was constructed with the commissioning of Nillahcootie Dam. Further storage of water in the catchment was realised in 1971, with the completion of a wall at the Winton and Green Swamps to form Lake Mokoan, storing water diverted from the Broken River and Hollands Creek by channels. It has been suggested a diversion weir for Lake Mokoan on the Hollands Creek created an instream barrier, which inhibited migrations of Macquarie perch (O'Connor, OH 111). Downstream of Nillahcootie Dam there is evidence that irrigation releases may depress temperatures by up to 5 °C (Ryan *et al.,* 2001).

Brown trout were introduced to streams in the Tatong area in 1873, being amongst the earliest releases into the Murray-Darling Basin in Victoria (Ritchie, 1988). Trout flourished in a number of streams in the upland and slopes zone of the Broken, being regularly captured near Benalla in the 1950s (Doxey, OH 110) and occasionally at Nalinga (Jones, OH 112) in the lowland zone. Redfin perch were introduced to a dam in Tungamah in 1904 and at about the same time near Numurkah (*Argus,* 14 May 1907). They became abundant in the Broken Creek by the 1920s, and local anglers observed a decline in catches of Macquarie perch and Golden perch after their arrival (*Argus,* 21 April 1925). Redfin perch were also associated with the disappearance of Blackfish in the Boosey Creek during the 1930s (Neil McQualter, pers. com.). They arrived at Benalla and Nalinga in the 1930s, becoming abundant (Doxey, OH 110; Jones, OH 112). Redfin perch were present in the Nillahcootie area in the 1950s (Ambrose Doxey, pers. com.) and, after Lake Nillahcootie filled, were abundant in the lake (Ambrose Doxey & Paul Berner, pers. com.). Acclimatisation activities continued until as recently as 1941 when Tench were liberated into some waters in the catchment including Ryans Creek (Ritchie, 1988). European carp reached Benalla in the 1970s (Doxey, OH 110).

Large kills of cod due to drought were reported in the Boosey Creek in 1902 (*Argus,* 23 April 1902) and again in the 1920s (Wallden, OH 113). Large kills in both the Broken and Boosey Creeks in January 1931 were associated with floods and decaying vegetation (*Camperdown Chronicle,* 31 January 1931). Catfish died in lagoons and creeks near Nalinga and the Boosey Creek during a drought in the 1920s (Jones, OH 112; Wallden, OH 113). Lake Nillahcootie was one of the earliest waters identified as harbouring EHN virus which caused the mass mortality of Redfin perch in 1985 (Langdon & Humphrey, 1986). The virus has been reported as being particularly lethal to Macquarie perch and has therefore been implicated in the decline of the species in some areas (Langdon, 1989). It is plausible that the virus may have been present and active in the Broken catchment prior to 1985 but evidence for its presence in the region before the 1980s is lacking. If the EHN virus began to exert its influence in the Broken during the 1980s then it played no more than a minor role in the demise of

Macquarie perch populations which had almost disappeared by that time. Major kills of Murray cod occurred in the Broken Creek in the early 1990s and November 2002. The causes of these kills is uncertain but is thought to be related to water quality issues including low dissolved oxygen (McKinnon & Shepheard, 1995; Rees, 2006).

13.4 The Current Situation

The *Sustainable Rivers Audit* concluded that:

> The Broken Valley fish community was in Very Poor Condition, with the Lowland Zone community in Very Poor Condition and the Slopes Zone in Moderate Condition. Fewer than half of the predicted native species were found. Although native fish were numerically dominant, these were small species and only one-third of the total biomass. Substantial species richness had been lost, and the biomass was dominated by alien species (Davies *et al.,* 2008).

The moderate rating for the slopes zone was largely derived from the large numbers of Blackfish and smaller native fish species collected from a number of waters during surveys. The slopes zone assessment also included Macquarie perch populations in the Hollands and Moonee Creeks and the Broken River between Nillahcootie and Benalla which had recently been re-established through stockings of juvenile fish, though serious decline has subsequently occurred in these populations during the recent drought. A short section of the Hollands Creek (approximately 25 km) has been designated a 'Demonstration Reach' where a coordinated effort is being made to repair the aquatic habitat to restore native fish populations (Raymond *et al.,* 2007).

In the top half of the slopes zone above Lake Nillahcootie cod are now absent, and Macquarie perch uncommon. Murray cod and Golden perch have been stocked into Lake Nillahcootie which, in the case of the latter, is well upstream of where the species has been historically recorded. Considering the fact that in the lower slopes zone Macquarie perch had been prolific, that it once contained Catfish and that cod are now uncommon, the rating for this type of habitat in the *Sustainable Rivers Audit* appears to be inaccurate, overestimating its true health. Redfin perch dominate some areas of the slopes zone and Brown trout are also present in numbers.

In the lowland zone stocking of Murray cod assisted in recovery of the population. There is evidence of cod spawning in the Broken River regularly, and they exist as a self-supporting population. The Golden perch fishery is probably maintained through ongoing liberations of fingerlings (Humphries & King, 2004). In recent years a series of fishways have been installed at weirs to facilitate upstream fish passage (O'Connor, 2006). In the lowlands Macquarie Perch are absent, while Silver perch and Catfish are uncommon captures, the latter existing as a relic population in the Broken Creek near Numurkah. The overall picture appears to be that downstream of Nillahcootie reasonable stocks of native fish now exist, though some key species are now rare, while upstream Macquarie perch exist as a small relic population. In recent years the upper Broken River has had little flow, sections of it being dry, as a consequence of the recent severe drought.

13.5 Newspaper Highlights

Argus, 23 April 1902
Tungamah. / Large numbers of fish, cod and perch, are being landed from the mud in the town tank, codfish weighing up to 25lb. and 30lb. having been caught.

Argus, 15 May 1908
Murray Silver Perch. "J.M." (Horton) says:- "whilst fishing lately in a tributary of the Broken River I caught several fish resembling in shape the Buffalo fish, as given in "Webster's Dictionary." They weighed about 1½lb., had a "pig" nose (white ring), and gave forth short grunts when drawn from the water. They frequent shallow water, and on a sunny day may be clearly seen basking in the sunshine. They are very shy, the least movement sending them into hiding. When the water is disturbed (as by dropping in of a pebble) they rapidly swim to the spot. They will not touch an ordinary bait at first, and not until they have been fed by worms are they tempted to bite. The flesh is very sweet."

Argus, 3 July 1917
Growth of Murray Cod. Some fisherman or angler familiar with the Murray and its tributaries may be able to give "M.C.D." (Violet Town) some particulars as to the growth of Murray cod. Last December, he says, they caught several Murray cod about three or four inches in length, which were of course returned to the water. / "Anywhere in the Broken River these little Murray cod are extremely plentiful, and the question is, when is there likely to be a prospect of good fishing in this river by reason of the great numbers of small cod which were there twelve months ago?"

Argus, 6 December 1921
Catfish. "Marlin" (Caulfield) says that catfish are plentiful in Winton Lake, and asks what bait is used for them.

Argus, 15 January 1924
/ "R.G.K." (Richmond) says that he has just had a fortnight's fishing in the Broken River and various creeks around Lima (via Benalla). Although he had good sport with Murray cod, bream (Macquarie perch), and catfish, which he remarks is a far finer table fish than is generally realised, he noticed, too, how numerous were the blackfish. He must have hooked over a hundred, but returned them all to the river

Argus, 21 April 1925
Cod and Redfin. Talking to a Nathalia boy during the week, he told me that the "Redfin" or English perch, once pretty numerous in the Broken Creek, had in his locality almost disappeared. The impression is that they are being eaten out by the large cod, of which there are many in the stream. There should be no regret about it, for the native perch of all these waters are far better fish than anything that might displace them. Along the Broken Creek there was a belief that the Macquarie perch (Murray bream) and golden perch decreased in number as the Redfins increased.

13.6 Broken River Catchment Oral Histories

The following oral histories (OH 110-113) mostly discuss the Broken River Catchment.

OH 110
Ambrose Doxey of Benalla was interviewed in October 2006 at an age of 86 years.
In the river upstream from Benalla years ago the three most commonly caught fish were the bream, the cod and the Blackfish. All three went up past Nillahcootie. The bream were very common. Mostly the Macquaries were up to about 2 pound. Two of the biggest I caught were over 3, nearly 4 pound. They were caught out in front in the old weir. You would get them in the spring and again in the autumn. In the summer the water was too low. Up past Nillahcootie, that was THE home of the Macquaries. Big, long, sandy stretches. Just after the war, about 1946, we fished up above William's Bridge. That was a long trip up there. Back then it was a dirt road! It was a Friday, about 4 o'clock and there was a big storm. We got 23 fish, mostly Macquaries up to about 4lb, fishing off a bank about 4 feet high. One would be on top of the bank fishing, the other at the bottom to land them.

Good cod were caught up past Mansfield. Up past Barjarg there were some good cod spots, really good holes. There were two types of cod, though we didn't take much notice back then. I think the second type were called bluenose, in amongst the normal cod. Around Benalla very few really, at least in my time. You saw them but you didn't take much notice. In my younger days Alf Smith the railway ganger, well he was a beauty on the cod. He caught one near the railway bridge in town with a rabbit down it's throat. I saw one caught that was 75 pound caught out of the lake outside the angling club rooms.

Other fish at Benalla, well there were yellowbelly. I can't remember any grunter being caught. The Catfish were caught in the river, but I haven't seen one now for over 50 years. The redfin turned up between the wars, at the time the lakes got built. The native fishermen thought the redfin were rubbish, though some blokes got good money for them. The carp turned up in the seventies. The trout arrived here in between. Well after the war the Macquaries got scarcer, more so after the dam got built.

OH 111
Redge O'Connor was interviewed in March 2007 at an age of 85 years.
I grew up at Nyah West and I can remember at Nyah and at Vinifer the paddleboats. Dad would say "let's go get a cod" and we would go fishing and get cod all the time. Out there in the Vinifer swamp there were lots of clay banks, bridges and holes in which the fish lived under. We'd go to different places to catch the different fish, callop in one place; cod in another, the grunter were in other spots. You never really caught them all together, they were in different places. We never caught a Catfish at Nyah; I've caught them at other places but not there. My grandfather Vernon at Nyah got a cod that went 122 pound; he got it on a centipede. We used to go out where the sleeper cutters were cutting the sleepers for the railway. There would be big rolls of bark and you would get the centipedes in them. My grandfather would cut the head and tail off them so they couldn't bite you and stick them on a real hook, a big one.

The callop and the grunter were plentiful, we weren't so keen on them to eat, the callop. And the grunter were very ranky, they had a strong fishy taste. You got the callop, got them both up to 3 pound, the callop 3, 4, 5 pound. The grunter were up to about 3 ½ pound, it got me with a spike, I got a poisoned thumb from one, had a day off school. The cod we used to catch anything 6, 7, 8 pound, 22 pound, used to throw a lot of small stuff back. I remember once I fished at Patcha, well I swam across the river; I had a handline tied to my belt with a yabby on it. I set it up on a springer, went to the toilet and when I got back I had a 6 pound cod on it. Back then there were no spinners, as I got older the aeroplane spinner came in, and then the floppies, I have still got some

floppies. At Nyah we used to get a rock cod, they were very scarce, hardly ever saw them. I thought they were a deformed cod. Later on when I moved over here from Bendigo, about 1950, they were in the Polly McQuinns Weir near Strathbogie. At Nyah and Polly McQuinns they weren't very big; a couple of pound was what you saw. At Polly McQuinns the rock cod were in the weir as well as down below, there was plenty of them in the weir when I fished it and a lot of the bream. The redfin they were in the Murray as far back as I can remember, when I was a boy. They were only small, there'd be shoals of them, tap, tap, tap, they'd go; they'd get the bait before the bream could. They were more or less a cannibal fish, they ate everything.

When I came over to Benalla the Broken here was full of the bream, the Macquarie perch, and cod. I remember there was lots of them in the Hollands branch and Ryans Creek as well as the river. They were pretty well originally everywhere in the river and the creeks right up into the hills, the bream and the cod. The cod were caught right up to the top of the Broken, that's from the blokes that lived here that have now passed on. There was a little creek just out of town over Sherwell's Bridge; years ago it had the bream in it, and the cod, and beautiful Blackfish. I remember my son once said he was going to catch a bream; he only grabbed a landing net. The bream were going up the Hollands branch to spawn and they were that thick he brought home a couple he caught in the landing net. They were about 2½ to 3 pound. But when they put the channel from Nillahcootie to Mokoan, they broke into the Hollands branch with a pipe, used it as channel. When the bream tried to go up they couldn't get past there, well that stopped them breeding. They are coming back we are getting them now at the junction of the Hollands and Ryans and up at Williams Bridge.

There was one old timer here Frank Cook, he just passed away recently, I used to visit him, he was 97. He told me that when he was a boy back then. All the creeks around here were full of cod, slimies and the Catfish. He said the Ryans Creek, the Hollands Branch and the Back Creek had those fish in them and lots of bream. He said the Baddaginnie Creek was the same back in the 20s, he got Catfish and cod there too as well as slimies. And Myrtleford, he mentioned catching Catfish in the Ovens River in Myrtleford. And Little Back Creek, one lady told me that her grandfather used to catch cod there many years ago.

OH 112

George Jones of Nalinga was interviewed in January 2008 at an age of 72 years.

I'm nearly 72 now, born in Violet Town hospital. Dad was a farmer, and a fisherman, he'd go out with a horse and jig or a bicycle to go fishing. My grandfather, he used to catch the bream and greasies here, and catch a few cod on homemade spinners. The black bream was in Dartmouth, that's the only other place I know of them other than the Broken. Goggle eyes they used to call them over here. In the Broken there was also the silver bream, or grunter. The black bream, years ago you could go down and catch 5 or 6 in an afternoon. Years ago they got 70 out of a drum net, and a trout. Three pound was a good bream, a lot of them a pound and a half, two pound. Used to catch them on a little cross line, out on a log. Silver bream, the grunter they were about the same, just as common. The first redfin at Redge Bensell's pump hole, I caught the first two redfin, then there was a lot of them in the river in a fortnight, come in like the carp. I suppose I was 14, 15, something like that. Years ago there was Catfish here till a drought killed them out. Dad told me he used to get them on the other side of Nalinga, Collin Gall's Creek near the college turn off, and in the lagoons on the Broken. The creek used to be deeper, now it's all muddied up. The yellowbelly you could catch them below the weir, an odd one. Dave Martin caught one nine pound in Woodcock's.

The cod, when I was young the average be 4 pound. Dad had a spinner, took it up the river, ordinary reel, pull a bit of line out, haul it in by hand, that's how he caught the cod. I had the spinner out of the water and a cod it jumped out of the river and grabbed it! I've got three 60s, a 53, a 42, a 36, caught a lot of bloody fish, some illegal, some legal. We used to get a lot on the carp, illegal. I got a water rat in one out of the river, and a black shag out of the 60 pounder. He spewed it out in the back of the ute, god it stunk! It was rotten. There was the

rock cod, dad used to call them that, that's the Trout cod, he mentioned them being around, never heard him say they'd been common here. I never saw one out of the Broken.

The greasies, some used to call them the Blackfish, but they're on the other side of the divide. You'd get them down with the bream, where there was the water lice running around on the water, in the roots of trees. You might get three in an afternoon, half a dozen. They disappeared when they pulled the snags out. We used to get the old tench. I set one, it had died in a bucket, got a 34 pounder, a cod, on a dead bloody tench. The bream, the Macquaries were the best eating fish, some liked the redfin. The grunter, one would be alright, others would be tough. The bream, they disappeared, they went before the carp were in. After the redfin come in. Then they snagged the river, the holes sanded up. Now when they want sand in Shepparton they could get it here, but they won't take it away from here. All the holes now are full of sand. We went fishing just this side of Benalla, there was a nice stream of water there, it was coming from the sewerage farm. I reckon that's one reason why the fish died out.

OH 113

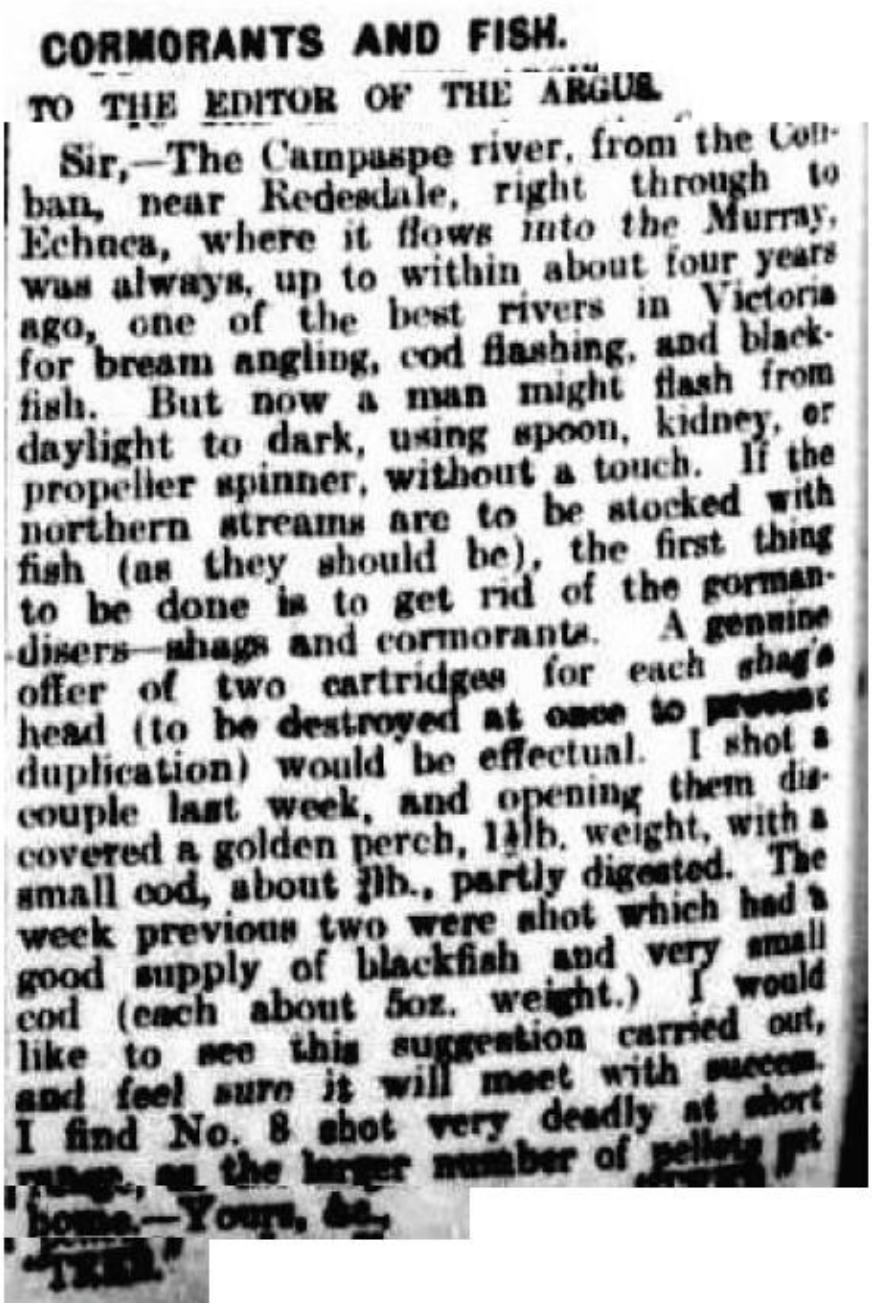
Cyril Wallden of Yarrawonga was interviewed in August 2007 at an age of 92 years.

I'm 92 years old, grew up at Naring between Yarrawonga and Shepparton. I used to fish the Boosey Creek; we lived two mile from it. There was a power of cod in there then, they were caught up to 50 pound. That would have been in the 1920s to the early 30s. There used to be Catfish and redfin and Blackfish. And a few yellowbellies. We used to get a lot of Catfish out of it. The Catfish they'd be about 3 or 4 pound, my father always used to get them, he liked them.

The creek used to go dry in summer but in the big holes was where the cod used to live. Every 2 to 3 mile along the creek there was shire dams, that's where the cod were. My father once put a nightline in and he got a cod about 8 to 9 pound and we brought him back and tethered him in the dam for the weekend on a long string. In the late 20s the cod all died. I was going into school and I went in there one day and there were two blokes from the shire fishing them out and burning them. No one knew what killed them. There's never been no cod in the creek since.

My father used to do a lot of fishing in the Murray, he was a great old fishermen. My father he lived on fishing, he spent a lot of time fishing. There's the photo of what we caught one trip taken about 80 years ago. We used to catch mainly cod and redfin, and the yellowbellies. And there was the grunter fish; they'd be 3-4, 5 pounds. Some liked them all right, but I didn't like them at all, they had a reedy taste about them. The redfin were good eating, but I prefer the cod. We sometimes used spinners but had handlines. My father would put a nightline in occasionally. I used to use mussels or yabbies, or little carp. Mostly yabbies and mussels. At one time we were cutting wood for a charcoal burner and this old bloke had sausages left over. So he put them in and he got two big cod on the sausages. One of the cod, my brother cleaned it and it had a 2 pound cod in it just dissolving off the bone.

14 Campaspe River Catchment



CORMORANTS AND FISH.

TO THE EDITOR OF THE ARGUS.

Sir,—The Campaspe river, from the Corban, near Redesdale, right through to Echuca, where it flows into the Murray, was always, up to within about four years ago, one of the best rivers in Victoria for bream angling, cod flashing, and blackfish. But now a man might flash from daylight to dark, using spoon, kidney, or propeller spinner, without a touch. If the northern streams are to be stocked with fish (as they should be), the first thing to be done is to get rid of the gormandisers—shags and cormorants. A genuine offer of two cartridges for each shag's head (to be destroyed at once to prevent duplication) would be effectual. I shot a couple last week, and opening them discovered a golden perch, 1½lb. weight, with a small cod, about ¾lb., partly digested. The week previous two were shot which had a good supply of blackfish and very small cod (each about 5oz. weight.) I would like to see this suggestion carried out, and feel sure it will meet with success. I find No. 8 shot very deadly at short range, as the larger number of pellets get home.—Yours, &c.,

"TEAL."

Argus, 3 February 1920

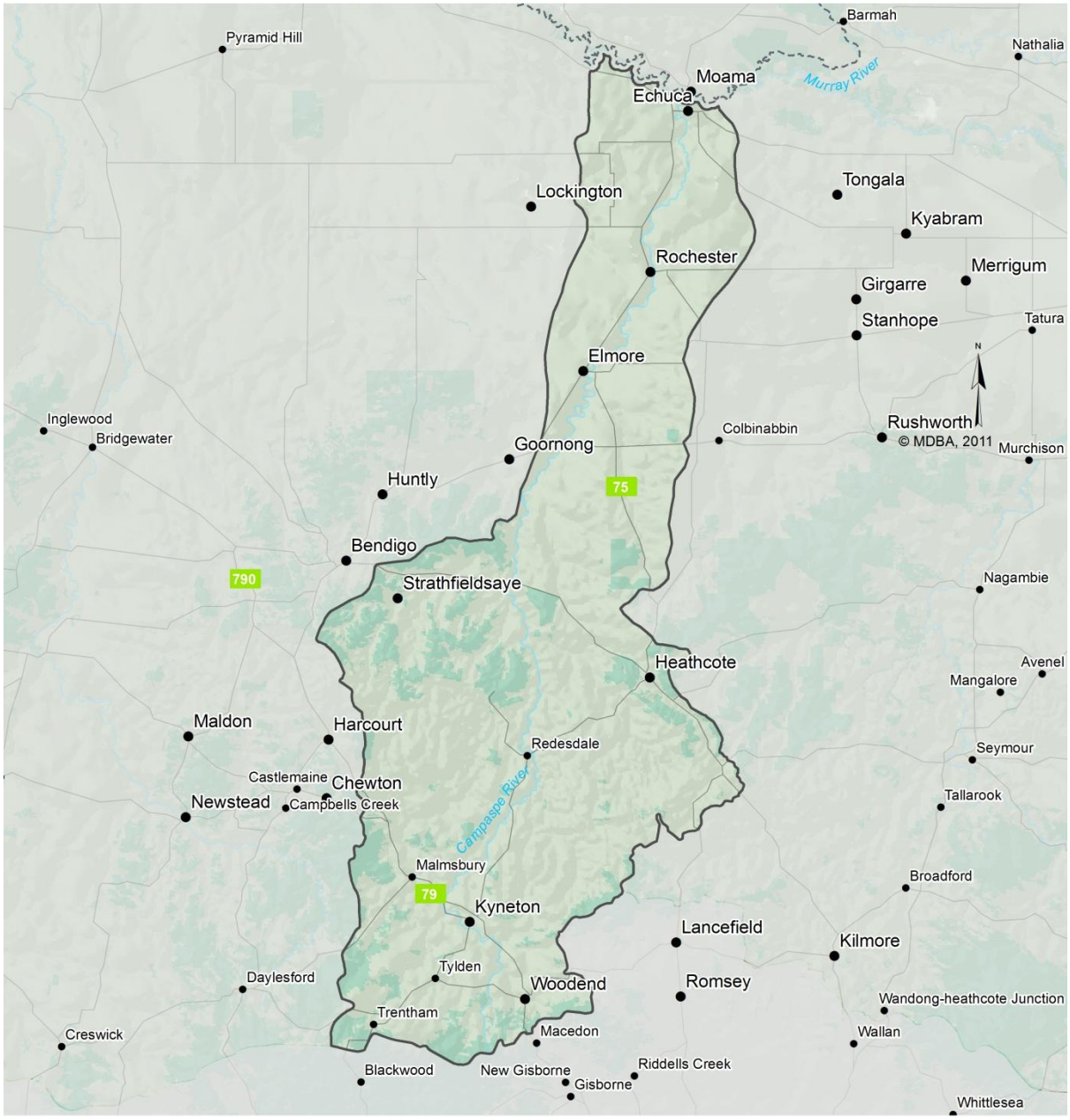
CORMORANTS AND FISH.

TO THE EDITOR OF THE ARGUS.

Sir, - The Campaspe river, from the Coliban, near Redesdale, right through to Echuca, where it flows into the Murray, was always, up to within about four years ago, one of the best rivers in Victoria for bream angling, cod flashing, and blackfish. But now a man might flash from daylight to dark, using spoon, kidney, or propeller spinner, without a touch. If the northern streams are to be stocked with fish (as they should be), the first thing to be done is to get rid of the gormandisers – shags and cormorants. A genuine offer of two cartridges for each shag's head (to be destroyed at once to prevent duplication) would be effectual. I shot a couple last week, and opening them discovered a golden perch, 1½ lb. weight, with a small cod, about ¾ lb., partly digested. The week previous two were shot which had a good supply of blackfish and very small cod (each about 5 oz. weight.) I would like to see this suggestion carried out, and feel sure it will meet with success. I find No. 8 shot very deadly at short range, as the larger number of pellets get home. – Yours, &c.

Argus, 3 February 1920

Figure 14.1 The Campaspe River Catchment showing major waterways and key localities.



14.1 Early European Accounts

The Campaspe River originates on an elevated plateau north west of Melbourne, carves its way through volcanic flows, cascading over falls to descend to the plains of northern Victoria, entering the Murray River at Echuca. The first European to enter the Campaspe catchment was Major Thomas Mitchell. On September 30 1836 Mitchell wrote in his journal 'arrived on the banks of a small and deep river with reeds on its borders, and containing many broad and deep reaches' which he named the 'Barnard'. Mitchell discovered a waterfall on the river Barnard which impressed him greatly by its immense beauty, recording it as the 'Waterfall of Cobaw', without explanation for the origin of either the name of the river or waterfall (Mitchell, 1838). Shortly afterwards Mitchell encountered another stream which he named the 'Campaspe' after Alexander the Great's legendary mistress depicted by the ancient artist Apelles (Mitchell, 1838). Mitchell's party eventually followed the Campaspe downstream passing through the future Heathcote area before taking a more eastward path to reach the Goulburn River.

The early settlers of the district applied the name of the Cobaw waterfall to the river itself. Alexander Mollison, who settled on the 'Cobaw' River in 1838, claimed responsibility for changing its name to 'Coliban'. He based it on the aboriginal corruption of the word (Bride & Sayers, 1969). The solitude of the early pastoralists was broken by the gold rush initiated by William Bulling whose discovery of gold, in December 1852, in the McIvor Creek near Heathcote, led to the establishment of a major goldfield (Randall, 1985). Subsequent discoveries took place near Malmsbury and Tylden in the top of the catchment but were comparatively minor workings. While significant, the gold fields of the Campaspe were relatively small by comparison to that discovered at Bendigo in 1851, where extensive deep mining of quartz reefs developed (Flett, 1979).

Few historical accounts have been previously reported of native fish in the Campaspe catchment. The earliest was written by an unidentified naturalist who described in detail the environment of the upper Campaspe and how his aboriginal assistant caught a 'fine codfish' (*Argus,* 14 March 1850). William Howitt, travelling from the McIvor diggings in 1854, recorded that on the Campaspe 'There were a number of natives fishing here, who had caught a good quantity of the river cod, and had learned to ask a good price for it' (Howitt, 1855). One early newspaper account described how:

> A party of young men went out on Good Friday, from Heathcote, to the Wild Duck Creek, on a shooting and fishing excursion, and at a spot in the creek just below Mr. Itzerott's farm they found a number of Murray cod swimming about with their noses just awash at the surface of the water: they shot six of the fish, and recovered the whole of them by one of the party going in for them when shot. The total weight of the six fish was 76 lb., the largest weighed 17 lb. Besides this fine take of cod, the party secured some other fish, such as grunters or catfish and blackfish, which like the cod were swimming about on the surface of the water in great numbers. We are informed by Mr. Itzerott that on the morning of Saturday he went down to the creek and saw fourteen or fifteen cod, weighing from 10 lb. to 15 lb. each, in shallow water, among some rocks (*Sydney Morning Herald*, 29 April 1870).

In 1973 the Victorian Fisheries and Wildlife Division's publication *Freshwater Fisheries Newsletter* contained an article on the history of native fish in the Coliban and upper Campaspe Rivers. The author was anonymous, but sourced the information from Keith Henderson a long-time resident of Harcourt. Henderson was well known for his philanthropy, was closely involved in the operation of trout hatcheries in the region, and actively pursuing the acclimatisation and hatchery production of native fish, particularly Macquarie perch (Clements, 1988). The article outlined how in the two rivers c1920:

> the angler would have caught Macquarie perch, Murray cod, trout cod and blackfish. Only the blackfish have survived the impact of man. Before 1950 these rivers were known as two of the best Macquarie perch streams in the State. Regular fishing trips between 1925 and 1935 by the Kyneton and Malmsbury Angling Clubs resulted in excellent bags of Macquarie perch; fish weighing up to 1.8 kg were common, with the average weight being 1.3 kg (Anon, 1973).

It then went on to describe the changes to fish populations in the area that transpired over the years, and speculated on the possible causes for the loss of native fish populations (Anon, 1973). John Clements, in his book on the history of fish introduction to Australia, recorded one of Keith's anecdotes on the fish in the Campaspe system. Around 1910 Keith and his school mates went fishing in the Axe Creek just east of Bendigo and were confronted with a scene of Macquarie perch schooling in their thousands in the flooded creek. The fish could not be angled but such was their numbers that some were easily taken by being hit with sticks (Clements, 1988). The story has been repeated to the author by a number of people that knew Keith Henderson, including his daughter Lyn Allan. These two accounts originating from Keith Henderson provided valuable insights into the fish of the upper Campaspe early in the twentieth century.

Photograph 14.1 Upper Campaspe River

Photo: *State Library of Victoria* nc000451, H1658. Native fish were once abundant in the Campaspe River upstream to Mitchells Falls in the Barfold Gorge. This image, dating from c1890, shows the river at that location at a time when native fish populations still flourished. Photo reproduced with the permission of the *State Library of Victoria*.

14.2 The Past Distribution of Fishes in the Campaspe River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the Campaspe catchment into a lowland zone (downstream of Redesdale), a slopes zone (upstream to Barfold and Metcalf) and an upland zone beyond the latter location. Only a few headwater creeks exist in the montane zone. Slopes type habitat, identified by the presence of confined valleys with streams containing extensive coarse gravel and sand substrates, extends downstream to the Axedale area. The slopes zone is treated as existing down to that location in this discussion. Apart from the slopes/lowland zone boundary, the habitat zones discussed below match those in the *Sustainable Rivers Audit.*

Most of the information presented below is sourced from quite a number of newspaper accounts and limited oral history (mainly OH 132-138). Very few old photographs of catches of native fish in this catchment have been located. It is recommended that further historical research be undertaken in this catchment particularly to locate early photographs of catches of fish and collect information on fish populations in the lower reaches.

14.2.1 The Montane Zone

Only a few very small streams penetrate into the montane zone of this catchment and there are no confirmed records of larger native fish being present, though one account suggests Blackfish may have been present (*Argus,* 3 February 1905).

14.2.2 The Upland Zone

A number of newspaper accounts record large catches of Blackfish in the upland zone, indicating that they were abundant. They were caught in the Campaspe River and local streams, such as the Post Office Creek near Kyneton, in 'thousands' and on one occasion large numbers were stranded by a flood in that town (*Argus,* 12 September 1870, 3 February 1905*,* 24 February 1905; 22 November 1921; 3 June 1927; Wilson, OH 133). Mitchells Falls in the Campaspe River near Barfold, and the Coliban Falls in the Coliban River upstream of Metcalf, provided significant instream barriers to fish passage. As a consequence, apart from Blackfish, none of the larger species of native fish were originally present in the upland zone (Wilson, OH 133; East, OH 134).

14.2.3 The Slopes Zone

Early newspaper accounts indicate that cod had been very common to abundant in the rivers and larger creeks of the slopes zone. One early account indicated a typical size of 4-5 lb. (1.8 to 2.3 kg) with fish up to 15 lb. (6.8 kg) being taken near Redesdale (*Argus*, 24 November 1856). In later years cod as large as 60 lb. (27.2 kg) were taken (*Mount Alexander Mail*, 2 February 1915). At the bottom of the slopes zone, Murray cod up to 100 lb. (45.4 kg) were captured, near Axedale (*Argus,* 14 October 1891). In 1911 it was suggested that 'the total weight of the fish taken from the Coliban and Campaspe since the season opened' had been 'tons' (Mount Alexander Mail, 5 January 1911). Cod were also common in the larger creeks such as the Wild Duck near Heathcote, where, in 1870, a party 'shot six of the fish, and recovered the whole of them by one of the party going in for them when shot. The total weight of the six fish was 76 lb., the largest weighed 17 lb.' and another resident 'went down to the creek and saw fourteen or fifteen cod, weighing from 10 lb. to 15 lb. each' (*Sydney Morning Herald*, 29 April 1870; *Argus,* 8 January 1909).

Keith Henderson reported the presence of Trout cod in the Campaspe and Coliban Rivers near Redesdale. His familiarity with the species is demonstrated by the surviving photographs of a specimen he captured from the Broken River during the 1970s (Photo BR1). Jock Nicholson's father, who was born at Heathcote, recalled that Trout cod had been common in creeks near Derrinal, including the Wild Duck Creek, and both were familiar with the Trout cod, catching them in the Murray River near Tocumwal (Nicholson, OH 67; Jock Nicholson, pers. com.). The oral history is corroborated by a news item in the *Argus* in which there was extensive discussion on the Trout cod or 'Murray trout' between correspondents which included good physical descriptions. In that article Mr. W. Wilson of Castlemaine reported 'I have caught dozens of Murray trout in the Coliban and cod at the same time. The difference was easily seen. The head of the trout is a different shape, and the mouth is smaller. I know of no better eating fish than trout' (*Argus,* 17 March 1911). Only two photographs of catches of cod from the slopes zone have been located. Both originate in the 1940s, by which time cod had become very scarce (Photos CR2-3; Anon., 1973). These photos record a single Murray cod. Collectively the oral history and newspaper account indicate that Trout cod had been very common in the slopes zone along with Murray cod.

Macquarie perch were abundant in the rivers and larger creeks of the slopes zone. Large catches were taken from the Campaspe River near Redesdale (*Western Mail,* 10 August, 1917; Anon., 1973) and in the Coliban River. Newspaper accounts regularly recorded good catches of 'bream' (*Mount Alexander Mail*, 12 January 1911, 7 February 1911, 14 December 1911). Keith Henderson described the Coliban and Campaspe Rivers 'as two of the best Macquarie perch streams in the State' (Anon, 1973). In the Axe Creek, Macquarie perch at times had been prolific (Clements, 1988) and a newspaper account also records 'bream' as being once present in the Wild Duck Creek, near Heathcote (*Argus,* 8 January 1909). Overall, Macquarie perch were abundant in the rivers and larger creeks of the slopes zone.

Silver perch were taken at times in both the Coliban and Campaspe Rivers. Donald MacDonald of the *Argus* examined a specimen sent to him by a Castlemaine angler taken in the Coliban River which was identified as *Terapon ellipticus*, a synonym for Silver perch. The article indicated that the fish was familiar to local anglers who debated how it should be classified (*Argus*, 20 November 1908). Una Taig indicated that she thought some 'grunter' had been taken near Axedale (Taig, OH 135) while the reported capture of 'grunter' in the Wild Duck Creek (*Sydney Morning Herald,* 29 April 1870) could have been Silver perch but is inconclusive. Una Taig recalled small numbers of Golden perch being taken near Axedale at the bottom of the slopes zone (Taig, OH 135) suggesting that they may have had a minor presence upstream though they were not recorded in oral history near Redesdale (East, OH 134). A regular newspaper correspondent with the nom de plume of 'Piscator' who resided at Castlemaine recalled catching a 2 lb. 'Murray perch' in the Campaspe River near Redesdale in the late nineteenth century. He provided several other accounts recalling captures of bream or more specifically Macquarie perch. His differentiation of this capture from the usual 'bream' suggests that it may have been a Golden perch (*Western Mail,* 25 September 1914). The available evidence indicates that small numbers of Silver perch were regularly taken in the slopes zone and Golden perch, while regularly taken near Axedale, were rare upstream.

Two second-hand oral accounts recall Catfish having been formerly present in the Campaspe River in the Redesdale/Barfold area in the early years of the twentieth century (Wait, OH 132; East, OH 134) and another first-hand account recalled Catfish being taken in the Axedale area near the bottom of the slopes zone (Colvin, OH 136). A newspaper article reported Catfish being taken from the Wild Duck Creek (*Sydney Morning Herald*, 29 April 1870) while a second recorded an incident of a Heathcote resident being stung by the spine of a Catfish, suggesting their local presence (*Argus,* 2 March 1868). Catfish were present upstream to the top of the slopes zone of the Goulburn catchment near Eildon (McKenzie, OH 116) and in the Loddon catchment near Clunes (*Clunes Guardian*, 31 August 1920). Given their presence in similar habitat in these two adjacent catchments it has to be concluded that these oral and written accounts indicate that Catfish were once

present, and not uncommon in slopes habitat in the Campaspe catchment, including in the rivers and larger creeks.

Blackfish were abundant in all habitats in the slopes zone including the Coliban and Campaspe Rivers near Redesdale (*Argus,* 24 February 1905; Anon., 1973; Wilson, OH 133), the Campaspe River near Axedale (*Argus,* 24 February 1905), the Wild Duck Creek near Heathcote (*Sydney Morning Herald*, 29 April 1870; *Argus,* 1 February 1924) and the Quinns and Mosquito Creeks near Axedale (Taig, OH 135; Colvin, OH 136). Blackfish were translocated from the Wild Duck Creek to the Wattle Flat Dredge Reservoir in the Loddon catchment upstream of Creswick and into the Hanging Rock Reservoir in the coastal Maribyrnong catchment (*Argus,* 1 February 1924). A newspaper account recorded that minnows or 'Mountain trout" had been common in Heathcote Creek (*Argus,* 13 May 1930).

14.2.4 The Lowland Zone

In the lowland zone most of the larger native fish were very common to abundant. At Strathallen it was reported that an angling party took a 'large haul of cod, perch, bream, and blackfish' (*West Australian,* 7 March 1914) and that it once contained 'golden perch which used to be plentiful in the Campaspe, the black perch and the silver perch or "grunter" ' (*Argus*, 5 February 1932). Murray cod were originally abundant near Rochester (Ken Major, pers. com.) and cod up to 40 lb. (18.14 kg) in weight were taken near Elmore (*Argus,* 19 March 1935). Cod up to 20 lb. (19.1) were common in lagoons near Goornong (*Argus,* 22 September 1906) and large numbers of cod were stranded at that location after a flood in 1939 (Read, OH 137). A letter to the *Argus* by 'S.M.' of Koyuga discussed the existence of a second, spotted type of cod in the Campaspe which he called the 'Murray trout' which was the common term for Trout cod (*Argus*, 5 February 1932). Although a specific location for the captures was not provided the author indicated that Golden perch were also common suggesting that it probably originated in the lowland zone adjacent to Koyuga (between Echuca and Strathallan). This one account suggests that Trout cod were present in the lowland Campaspe River and that they were relatively common.

Oral history recalls Macquarie perch to have been very common in the Avonmore area near Elmore at the end of the 1930s (Mudford, OH 139) but they were not recalled in later oral history at Rochester (Major, OH 138). The *Argus* reported that the Campaspe had once supported very good 'bream' fishing all the way down to the Murray (*Argus,* 3 February 1920) and that three perch species including 'black perch' were present (*Argus*, 5 February 1932). Silver perch had been very common at Rochester along with some Golden perch (Major, OH 138) which were described as once having been 'plentiful' in the Campaspe (*Argus*, 5 February 1932). A newspaper report in 1917 recorded three anglers fishing the Campaspe River five miles above Echuca and catching 'cod, perch and butterfish' (*Western Mail*, 13 April 1917). 'Butterfish' was a common early name for Macquarie perch, particularly amongst commercial fishermen (Laddie Clifford & Henry Davies, pers. com.), so the account probably records the capture of both Golden perch and Macquarie perch. The limited information available suggests that in the lowland zone Macquarie perch were abundant in the upper reaches, but declined in prevalence downstream, though were caught in numbers all the way to the Murray River, while Golden perch and Silver perch progressively increased in numbers downstream, being abundant in the lower half of the lowland zone.

Only a single account recalls the presence of Catfish in the lowland zone above the Elmore Weir (Major, OH 138) though, given their reported presence upstream at Axedale (Colvin, OH 136), and the presence of significant numbers in similar habitat in the adjacent Goulburn Catchment, they were probably originally common. Blackfish were reported as being caught all the way down to the Murray River and considered to be

a pest (*Argus,* 24 February 1905; *Western Mail,* 13 April 1917). They were common near Strathallan (*West Australian*, 7 March 1914), present at Rochester (*Argus,* 12 November 1910) and at Goornong, where large numbers of Blackfish were reported being stranded after a flood (*Argus,* 21 August 1923). They were also common in the lower reaches of the Forrest Creek (Read, OH 137). Overall, Blackfish were widespread and very common to abundant in the lowland zone.

14.2.5 Estimates of Native Fish Abundance in the Campaspe River Catchment at European Settlement.

Presented below are the rarity scores used in the *Sustainable Rivers Audit* (Davies *et al.,* 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 14.1 Campaspe River Catchment Rarity Scores (Main River Channels)

	Lowland* (Murray River to Axedale)		**Slopes*** (Axedale to Mitchells & Coliban Falls)		**Upland** (Upstream of Mitchells & Coliban Falls)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod	3	L3?	3	U3	3	0
Murray cod	5	**5**	3	U3	1	0
Golden perch	5	5	1	L1	0	0
Silver perch	3	**U3**	0	U1	0	0
Macquarie perch	3	U3	5	**5**	3	0
Catfish	0	U1?	0	1	0	0
'Blackfish'	3	**U3**	5	**5**	3	**5**

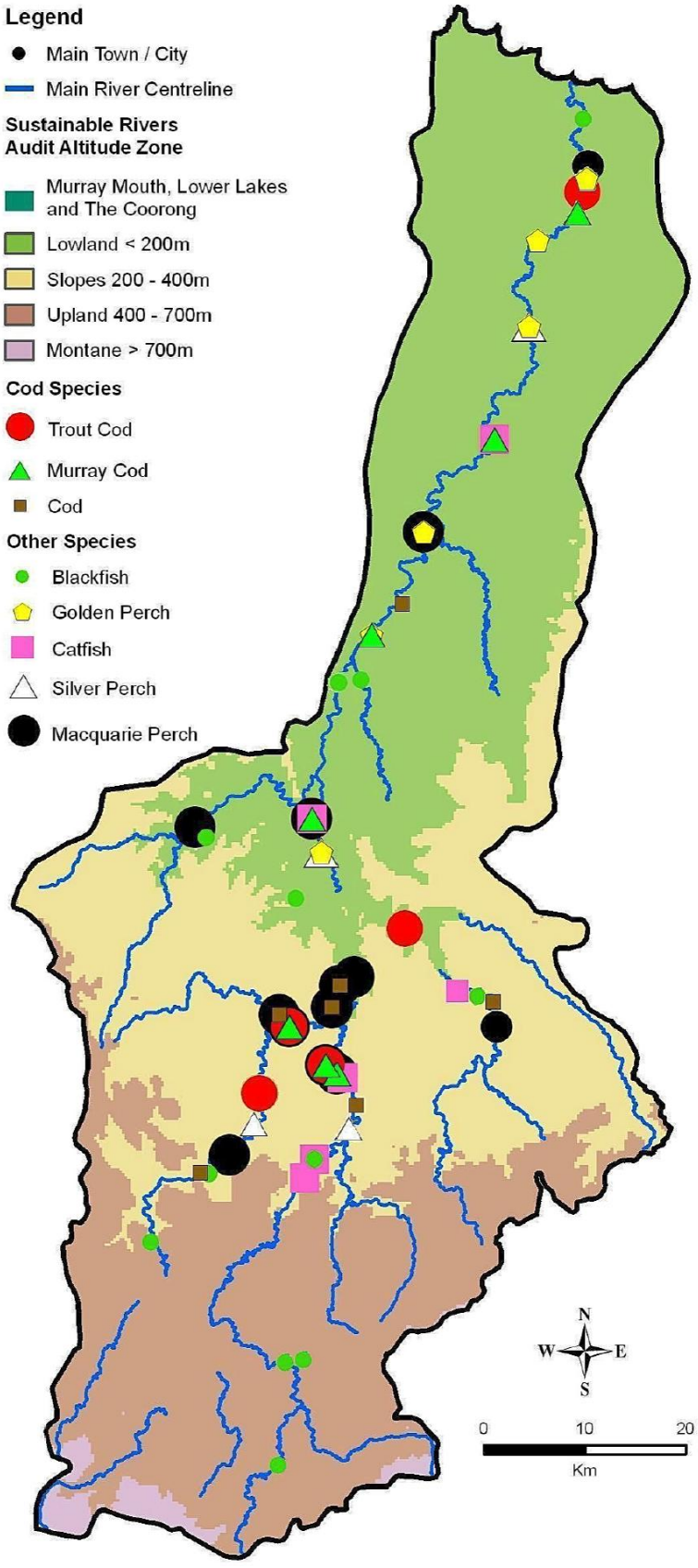
Key
0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type supported by multiple accounts or lines of evidence e.g. Oral history, newspaper accounts, photographs.

* Note: Some of the boundaries used for this zone are at a lower altitude than those used in the *Sustainable Rivers Audit*

Figure 14.2 **Historical Records for Native Fish in the Campaspe River Catchment**



Photograph 14.2 Macquarie Perch at Redesdale

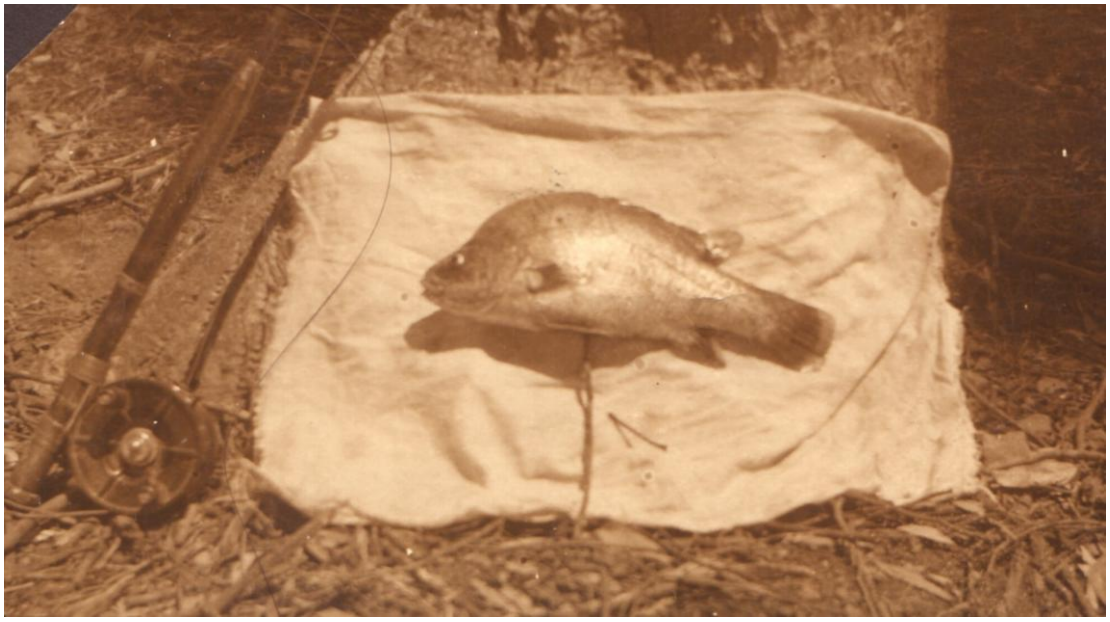


Photo CR1: A Macquarie perch caught by Keith Henderson from the Campaspe River at Redesdale in 1921. Up to the 1930s Keith considered the Coliban and Campaspe to have been two of the best rivers in Victoria for Macquarie perch. Around 1910 when he was a boy the species was so prolific in the Axe Creek that they could when schooling be killed with sticks. By the 1960s Macquarie perch were extinct in the Campaspe catchment. Photo courtesy of Mrs Lyn Allan.

Photograph 14.3 Murray Cod at Redesdale

A Murray cod caught by Keith Henderson from the Campaspe River at Redesdale, 1947. Cod were once very common in the rivers and larger creeks in the slopes zone of the Campaspe catchment. Both Keith Henderson and Jock Nicholson also recalled the past presence of Trout cod. By the time this photo was taken Murray cod were rare at Redesdale and Trout cod extinct. Photo courtesy of Mrs Lyn Allan.

14.3 The Changes

14.3.1 Changes to Native Fish Distribution and Abundance

In the slopes zone an early decline was reported in the fish populations of the creeks near Heathcote such as the Wild Duck. Previously reported to have contained 'cod', 'grunter', Catfish and Blackfish, by 1909 a local resident reported that they now contained 'useless blackfish, and a few bream and cod, which are rarely caught' (*Argus,* 8 January 1909). A newspaper account recorded occasional catches of cod taking place near Redesdale in 1933 (*Argus,* 21 December 1933), a clear reduction in abundance compared to earlier accounts. The decline in the Macquarie perch population was such that in 1936 fish were translocated from the Broken River to the Coliban River to bolster the population and another attempt was made in 1962 (Cadwallader, 1981). Keith Henderson indicated that by 1950:

> Murray cod were becoming scarce, and trout cod had not been heard of for many years. The last Murray cod known to be caught came from the Redesdale area of the Campaspe River in 1957 and weighed 7.7 kg. Macquarie perch were scarce after 1945, but were occasionally taken until 1962 (Anon., 1973).

By the 1970s the only native fish present were Blackfish (Anon., 1973).

In the lowland zone a notable decline in the fishery was reported at the end of World War One. A correspondent to the *Argus* wrote:

> The Campaspe river, from the Coliban, near Redesdale, right through to Echuca, where it flows into the Murray, was always, up to within about four years ago, one of the best rivers in Victoria for bream angling, cod flashing, and blackfish. But now a man might flash from daylight to dark, using spoon, kidney, or propeller spinner, without a touch (*Argus,* 3 February 1920).

Golden perch and Murray cod remained reasonably common at Goornong into the 1930s but, after a flood in 1939 which stranded large numbers of fish, they became scarce (Read, OH 137; Ken Read, pers. com.). By the end 1930s the larger native fish were scarce near Axedale (Taig, OH 135); by the 1940s Golden perch and Catfish were scarce near Elmore; and Macquarie perch and Blackfish were rare (Major, OH 138). Trout cod were last reported in the Campaspe River in 1932 (*Argus*, 5 February 1932).

14.3.2 Changes to Habitat

Changes to the ecology of the Campaspe catchment transpired shortly after the arrival of Europeans. Some tree clearing occurred as soon as the pastoralists commenced grazing, which accelerated with the subdivision of selections, which then drove the need for more intensive stocking of the land. Alluvial mining on the McIvor Creek in the Heathcote area had a drastic effect on the aquatic and terrestrial environments through the direct destruction of the stream beds and clearing of vegetation (Flett, 1979). An early introduction to the catchment was the rabbit which escaped from an enclosure at Castlemaine in 1863 and by 1881 had over-run the Heathcote area (*The McIvor Times and Rodney Advertiser*, 31 August 1881). Around the time of the First World War further land clearing occurred and this, along with the activity of rabbits and overgrazing, resulted in extensive erosion being noted in government reports by 1949 (Russell & Long, 2007). In 1939 a major flood deposited large volumes of silt in the Campaspe River near Axedale and Goornong, as well as stranding large numbers of fish (Colvin, OH 136; Read, OH 137). Silting of the holes near Redesdale was linked to a decline in native fish populations (Anon., 1973). Clearing of the vegetation also resulted in the saline water table rising, initiating dryland salinity and vegetation dieback, notably in the Axe Creek area (Lorimer & Schoknecht, 1987).

The upper Campaspe was amongst the first areas in Victoria into which alien fish species were introduced. This was driven by the lack of large native fish created by the waterfall barriers near Metcalf and Barfold. In December 1872, 430 Brown trout from the Ballarat Acclimatisation Society were released into the upper Coliban River, with further releases taking place in 1875 and 1881. By 1895 the trout had become established in local streams and were eventually caught in numbers as far downstream as Redesdale (Kyneton Historical Society records; *Mount Alexander Mail*, 12 January 1911; *Argus,* 21 December 1933). A volunteer hatchery was established by the Kyneton Anglers Club in 1924 which, along with government releases, maintained the trout population (Ritchie, 1988; Clements, 1988).

Redfin perch were liberated in the Campaspe River in 1875 (Kyneton Historical Society records) and the state Water Supply Department introduced them into Malmsbury Reservoir to control crayfish (*Argus,* 22 February 1893). They became abundant in the reservoirs in the upland zone, and were very common in the Malmsbury area by 1911 (*Mount Alexander Mail*, 14 December 1911). A newspaper account suggests that 'perch' were present in the slopes zone at the Campaspe/Coliban junction in 1911, but were not as common as the native fish, indicating that the 'perch' were Redfin perch (*Mount Alexander Mail*, 5 January 1911). By the 1930s Redfin perch formed the bulk of the catch near Axedale and at Elmore (Taig, OH 135; Major, OH 138; *Argus,* 29 December 1945). Tench were also introduced into the Campaspe River Catchment being first reported near in the Coliban River in 1917 (*Mount Alexander Mail*, 20 November 1917). By the 1940s they were abundant at Rochester (Major, OH 138). 'Carp' which were probably Goldfish, were released into the Coliban River in 1873 (*Argus,* 21 August 1873) and the description of the capture of a carp-like fish at Strathallan in 1914 suggests that Goldfish were present in the lower Campaspe by that time (*West Australian,* 7 March 1914). In the 1970s European carp arrived in the lowland zone and eventually gained access to the slopes zone in Lake Eppalock, probably through their use as bait by anglers.

In 1865 construction commenced on the Malmsbury Reservoir on the Coliban River to supply the burgeoning population of Bendigo with water. After its completion in 1877, water was diverted to the Malmsbury Reservoir from the Coliban River to Bendigo. This deprived the Campaspe River of some of its flow, from what was its most reliable source, given that the upper Campaspe River itself was highly variable. Further water storages were constructed at Upper Coliban, in 1903, and at Lauriston, in 1941, resulting in the flow in the Campaspe River below Redesdale becoming increasingly regulated and the total flow reduced (Russell & Long, 2007). In 1961 work commenced on the Eppalock Reservoir just upstream of Axedale on the Campaspe River with the intention of providing additional water to Bendigo as well as irrigation releases down the river itself. It was completed in 1963. This has been suggested to have been the final blow to the relic Macquarie perch population, flooding out the best remaining habitat (Anon., 1973). It also dramatically increased the regulation of flows in the river as well as thermally polluting the river for some distance downstream (Ryan *et al.,* 2001).

The rivers feeding Lake Eppalock now only contribute about 10% of the flows they did a few decades ago. This is due to decreases in rainfall, water diversions and retention of runoff in numerous farm dams. In addition past degradation of the landscape resulted in the loss of considerable subsoil water. Recent actions to improve vegetation cover, while being undertaken for the long term benefit of the catchment, have been suggested as reducing runoff. It is estimated that it could take up to 60 years of subsoil recharge before runoff returns to something resembling natural conditions (Russell & Long, 2007). Below Lake Eppalock excessively high, cool flows for irrigation during summer and low flows held back for storage during winter have dramatically altered invertebrate populations, a source of food for fish, as well as increasing sedimentation (Humphries & Cook, 2004).

14.4 The Current Situation

The *Sustainable Rivers Audit* concluded that 'the Campaspe Valley fish community was in Extremely Poor Condition. The community had lost most of its native species richness, and alien species contributed most of the biomass and abundance' (Davies *et al.,* 2008).

In terms of native fish populations it scored equal lowest in the entire Murray-Darling Basin, along with the Goulburn catchment, with the fish fauna being dominated by introduced species. Substantial stockings of Murray cod and Golden perch have occurred, particularly at Elmore and downstream, and while populations of both are present, there is no evidence of natural reproduction occurring. This seems to be due to the regulated flow conditions, so their populations are maintained by ongoing hatchery releases (Humphries & King, 2004).

During the early 1990s releases of hatchery produced Trout cod and Macquarie perch occurred in the Coliban River downstream of Malmsbury Reservoir. In subsequent years anglers reported the capture of a few individuals. The overall poor survival may have been the product of a severe drought at the time. Greater success was achieved in Upper Coliban Reservoir where hatchery produced Macquarie perch were released and survived well. Reports from anglers suggested that some reproduction may have occurred in the inflowing Coliban River, with a number of very small perch being reported captured some years after the initial liberation. During the recent drought Upper Coliban Reservoir went dry in early 2007 and a small number of adult Macquarie perch were rescued and placed in Lake Eppalock. As a consequence the Macquarie perch population in the Upper Coliban Reservoir was lost.

14.5 Newspaper Highlights

Argus, 24 November 1856
Fish. – The Loddon and Campaspe abound with excellent fish, and we are pleased to see that an effort is being made to supply our market with this most healthy and desirable article of food. A few days since cod fish from the Campaspe were sold in the township at 1s. 6d. per lb. The fishing season is now commencing, and in about a month cod fish will be plentiful in the Campaspe. They have been caught, we are told, in the river weighing fifteen pounds each, but the usual weight is from four to five pounds – Miners Right.

Argus, 16 February 1869
With reference to the late cases of supposed fish-poisoning by the pollution of the Yarra, a correspondent writes to us from Malmsbury to say, that a day or two ago after the late severe thunderstorm, numbers of dead fish, chiefly cod, were found floating in the various waterholes of the Campaspe, in the neighborhood of Redesdale.

Sydney Morning Herald, 29 April 1870
The following somewhat remarkable story is told by the Rodney Advertiser: – " A party of young men went out on Good Friday, from Heathcote, to the Wild Duck Creek, on a shooting and fishing excursion, and at a spot in the creek just below Mr. Itzerott's farm they found a number of Murray cod swimming about with their noses just awash at the surface of the water: they shot six of the fish, and recovered the whole of them by one of the party going in for them when shot. The total weight of the six fish was 76 lb., the largest weighed 17 lb. Besides this fine take of cod, the party secured some other fish, such as grunters or catfish and blackfish, which like the cod were swimming about on the surface of the water in great numbers. We are informed by Mr. Itzerott that on the morning of Saturday he went down to the creek and saw fourteen or fifteen cod, weighing from 10 lb. to 15 lb. each, in shallow water, among some rocks; he took hold of them, one at a time, but they slipped out of his hands with a violent jerk, and after several in-effectual attempts to land one of them he went up to his house and procured a knife, he then went down again, the fish were there still, and he managed to secure two about 14 lb. each, by sticking his knife under their gills, and then pulling them out. During the week the creek has been well watched by sportsmen, some armed with guns and some with spears. Several parties have thus secured a fish or two, but it would appear that this novel kind of sport is all over for the present, as the fish have returned to their old levels, or gone down the creek for the benefit of their health. It is generally supposed that during the late heavy rains, while the creek was up, the fish came up from the Campaspe, and the water in the creek being rather turbid from the washings from the ploughed land and farms, had sickened the fish, and caused them to swim as described."

Argus, 12 September 1870
"Fishing," says the Kyneton Guardian, "was made easy to such as cared to be at the trouble of taking a bucket to the racecourse on Friday and pick up the numerous blackfish stranded by the flood, and left high and dry among the grass, oven at some distance from the banks of the Campaspe."

Kyneton Guardian, 15 February 1900
Angling: - Messrs. Clark and Metcalf, senrs., spent a night fishing in the Redesdale district last week, and were very successful. Mr. Metcalf securing several nice cod and bream, and Mr. Clark landed a cod of eighteen pounds.

Argus, 20 November 1908
The Silver Perch. Messrs. Marshall and Sarman (Castlemaine) send a fish which is caught both in the Coliban and Campaspe streams. Some local anglers say that it is a bream, others that it belongs to the perch family. The latter theory is correct. It is the silver perch (Terapon ellipticus), caught up to 5lb. in weight in western rivers of New South Wales, but seldom found so far south in Victoria. In the Murray it is generally called the silver bream.

Mount Alexander Mail, 5 January 1911
Messrs. Timmins and Party went out to the junction of the Coliban and Campaspe for two days' fishing last week. They got about 50 lbs of nice bream and cod, and one perch 3 lb. It would be interesting to get the total weight of the fish taken from the Coliban and Campaspe since the season opened. Probably there have been tons taken out, as the streams have been visited by scores of anglers day and night during the holidays, as well as before, some getting very good hauls.

Mount Alexander Mail, 12 January 1911
Mr. R. T. Oliver hooked five nice trout in the Coliban last week, the weights being: - 2 lb 7 ozs; 1 ½ lb; 1 lb 6 ozs; 1 ¾ lb; and 2 lb 6 ozs, making 9 lb 7 ozs in all, which is a very satisfactory haul for one week. Messrs. Malone and Ealey had a few days' fishing last week at Horseshoe Bend, and besides getting some good bream, they got three nice cod, one 13 ½ lb, one 5 lb, and one 2 ½ lb. A fisherman from Bendigo got a cod in the same hole weighing 41 lb, which he weighed at Mrs. Wilson's Hotel at Lyal. Fish like these are worth going a journey for.

Mount Alexander Mail, 7 February 1911
A novel fishing match took place on Saturday on the Coliban River below Lyal. Mr. M. Cluning, of Castlemaine, challenged Mr. H. Roberts, of this district, to fish him for the championship of the district [but it is not known how either man aspires to the honor of being champion]. The Castlemaineite was armed with every description of bait and tackle, while our local man had spent from Wednesday night till Saturday night, hunting up every conceivable bait from rabbit's liver to the common earthworm and was san of pulling off the belt. They started after the rain ceased, about 3.30 p.m., and came home on Sunday, when they sent the writer to weigh their respective catches. Mr. Roberts' catch turned the scale at 9 ½ lbs, and Mr. Cluning's at 12 ½ lbs., so that Castlemaine won by 3 lbs. The fish were a splendid sample of bream, from ½ lb. to a little over 1 lb., and one cod under 2 lbs., and the quality can be vouched for, as both gentlemen gave the writer about 6 lbs. between them [so he is anxious to hear of another challenge match taking place]. The challenge brings up memories of a picture to be seen in the bar of an hotel in New South Wales, where about 20 men are shown with their glasses charged in the bar, and their mouths open, and bent down with laughter, and the writing below says, "Of course the joker is paying for the drinks." Of course our local champion found the turn out, but he is pleased that he gave his opponent a close go, but luck was against him.

Argus, 17 March 1911
Murray Trout. / Another Note. Mr. W. Wilson (Castlemaine) sends the following note: "I have caught dozens of Murray trout in the Coliban and cod at the same time. The difference was easily seen. The head of the trout is a different shape, and the mouth is smaller. I know of no better eating fish than trout. I have never heard of one being killed that weighed more than 10lb."

Mount Alexander Mail, 5 December 1911
Mr. J. Oliver hooked a 3 lb. cod on Friday below the falls, and Mr. R. Oliver one 2 lb. A large body of anglers were out on Friday and Saturday nights, but no hauls of any consequence were made, only a few cod and bream. Rumor hath it that the season opened two months ago along the Coliban and Campaspe, but the writer considers it as a joke, as knights of the rod are too true sports to fish out of season.

West Australian, 7 March 1914
While fishing in the Campaspe (Vic.) above the Strathallen bridge, Mr. P. Gorsian landed a fish which for beauty points eclipsed the party's large haul of cod, perch, bream, and blackfish. The fish was of a brilliant golden colour, with unusually large scales, the size of a sixpenny piece. Its mouth was small and peculiarly pursed. It was caught with a worm bait, and was undoubtedly a beautiful fish.

Mount Alexander Mail, 2 February 1915
Sensational hauls of fish have been conspicuous by their absence this year, although a considerable quantity of worms have been drowned. Yet that ardent angler still lives on hopes of getting a "whopper," and the streams are lined morning and night. A few nice trout and perch have been caught. A local angler got a 3 lb. trout in the Billy Goat hole, and a 32 lb. cod. I am informed on very good authority, was murdered out at the Dead Pig on the Campaspe. The bait used was box sapling. From the same source it is learned that a 62 pounder was massacred in the Cat and Kittens, near Lyal.

Western Mail, 13 April 1917.
/ A party of three anglers paid a visit to the Campaspe, about five miles above Echuca, with gratifying results, the total catch being 45 fish for three hours fishing weighing 92lb. They included cod, perch and butterfish. One of the party, Mr. W. T. Tonks, accounted for 16 fish, averaging 2½lb.

Argus, 5 February 1932
Campaspe River Fish. S.M. of Koyuga is puzzled by the native fish of the Campaspe. "Are there two different species of Murray cod?" he asks. "Because the markings of the large Murray cod and the spotted kind called 'Murray trout' are quite different." About 50 years ago McCoy pointed out that the difference in appearance was sexual, the female fish changing much as spawning time approached. T. C. Roughley in his book respects the statement and it is worth pointing out that the first rate colour plate in the "Fishes of Australia" shows the spotted cod which fisherman of the Murrumbidgee called "Murray trout" and regard it as a different species. S.M. says that he knows the golden perch which used to be plentiful in the Campaspe, the black perch and the silver perch or "grunter," but not Macquarie perch. His black perch is usually called in Victoria a "Murray bream" is the Macquarie.

14.6 Campaspe River Catchment Oral Histories

The following oral histories (OH 132-138) mostly discuss the Campaspe River Catchment.

OH 132
Graham Wait of Metcalf provided these comments in July 2007
My mum grew up at the Campaspe, she grew up near Barfold, born in 1900. She talked about catching the Catfish and the Blackfish. She used to mention these Blackfish, she said they were beautiful to eat, and that she used to get the Catfish.

OH 133
Kevin Wilson of Chewton provided these comments in July 2007.
The cod and the bream, up as far as the Coliban as far as I know they wouldn't have got up past the Coliban Falls, down in Barber's. I know the Blackfish were in there, my father did catch them around Metcalf and Malmsbury, never grew to be a big fish. I know in the Loddon up above Guildford there was a hole known as the 'cod hole'. The Dalmenicos had photos of the cod caught out of the cod hole at Guildford. They were caught a long time ago.

OH 134
George East of Emberton was interviewed in July 2007 at an age of 76 years.
My ancestors settled here in 1860, right where I'm living now in Emberton. They originally worked for Mitchell. My father and uncle, George and Alex East they used to catch plenty of cod and bream, no problem feeding the family. They said the Catfish were caught in the Campaspe, from Redesdale up to the falls at Barfold. They never spoke of yellowbelly in the area. That was when the river used to run. When they built Eppalock that stopped all the fish from coming up the river.

Where I am I've seen the Campaspe come out a hundred meters out over the banks, but it's been a while since I've seen that. There was a property down in Emberton where there was a long hole, its still there. My dad and uncle once stunned some trout by firing a rifle near them. The best cod I've heard of was by a bloke by the name of Jim McNaught up at Patho. He knocked one on the head in a channel with a shovel, in the late 1940s. It weighed 127 pound.

OH 135
Una Taig of Bendigo was interviewed in December 2007 at an age of 78 years.
I'm 78, grew up in Axedale. In the river there were cod, redfin and a lot of tench. From memory there were a few Golden perch, yellowbelly is what we knew them as. I'm not absolutely sure if there were any grunter, I think there was a few. That would be going back 70 years, a fish was so common in out household, my father was a keen fisherman. Sometimes they would go out to Quinn's Creek, dad used to bring the Blackfish home from there, they were beautiful to eat, he got plenty out there. But in the river, in my day we got redfin more than anything.

OH 136
John Colvin of Axedale was interviewed in December 2007 at an age of 77 years.
My father used to get the codfish here in the Campaspe, that was in the late 1930s, and the bream, they were pretty common. I've heard of the Catfish here too. There were Blackfish in the Mosquito Creek, up to the falls, it's a creek on the western side of Eppalock, it goes into the river a mile up from here, pretty brackish. 1939 was known for an extraordinary flood event, that was Easter 1939. There was major floods in the Axe Creek, Mosquito Creek and Sweenys Creek, that's when there were changes in the river. But before that my brother

told me about a small flood that washed all the sheep manure into the river and it was killing the fish. He said he could go down and just put his hands on them, he told me that.

OH 137
Ken Read of Goornong was interviewed in December 2007 at an age of 80 years.
I was born in 1928, grew up here around Gornong. The old people told me that they used to get the Blackfish in the Forrest Creek, it joins the Campaspe at Jurrandown, now it's all silted up. There were some blokes that used to put some wire netting traps in the Campaspe here on my property, I occasionally helped myself to some of the fish they'd catch, they were yellowbelly.

There was a flood in 1939, it started in one of the smaller catchments. Well it smothered the river, there was dead cod washed up all over the paddocks here. It was a sudden flood and when the river went down people were picking them up with pitchforks, some were still flapping, they were trapped in all the depressions. They were stranded and they picked up some big cod, they were trying to get out of the muddy water. The particular stream that formed the flood, out towards the 'wild duck', it was a localized flood, it wiped them out, that's when the Campaspe silted up. The Axe Creek, well it would have to be a saltwater fish to live in it now, it's a major contributor of salt to the Campaspe.

OH 138
Ken Major of Rochester was interviewed in December 2007 at an age of 73 years.
The Campaspe, I've lived on it for 73 years. Me grandfather arrived here in 1903, me father was born in 1905, I was born here in 1934. Dad was a very keen fisherman, but didn't talk about the river much. Halfway between Elmore and Rochester is the Campaspe Weir. In 1940 Rochester ran short of water, it was a big drought. In the drought they had the blokes, and even the scouts digging in between the holes to get the water down to the town. It drained all the holes, you could walk across it. My grandfather and father talked about going up the Murray with a horse and gig. They used the knob of a german sausage and the spine out of a bullock's back, up towards Stewarts Bridge. They were cod mainly, quite a lot of cod. They also used to go out and catch cod in the Kanielle Creek, but it's all silted up now, there's only a bit of a depression in it.

Dad used to take me down fishing when I was a kid, before the big drought started. They used to go fishing for cod and that in the Campaspe Weir, and they got a lot of redfin and tench. I can remember we did get a cod of about twenty pound when I was about 5. There were people there called Scanlen, they'd use their boat, dad and old uncle Bert. After the drought the cod didn't recover much, they had got hammered. When I was a kid they used to take me fishing down near the water tower here. They used to get a few yellowbelly, they mentioned them but I hadn't caught one. We did get the perch, the Silver perch, they were most common at probably half a pound.

Down towards Strathallen my dad did catch a few yellowbelly there which I saw, not many, and a lot of redfin. I did hear of Catfish above the weir, but never saw them. I've never heard of the Macquarie perch here, or the Blackfish. About the only Blackfish I've seen is up Castlemaine way, me grandfather took me out there, only in the small creeks, and we'd get them at night, only about six inches long. We caught one at Picnic Point once. I can remember this young bloke, in the early 1950s caught this trout 4 to 5 pound just below the weir.

15 Central Murray River Catchment

It was on my great day that I paddled, or rather drifted, down the Murray one mild, cool January morning. Above me an opal sky, below the rushing stream, there brawling over a shoal, here crisping to a vagrant breeze, there running smooth as glass over a deep pool, never still, never silent, always sucking and gurgling, bubbling and sighing, whispering its messages to the vacant fancy.

It was a voyage of discovery. Never before had I wetted line in the reaches I was about to fish. I was breaking ground for a friend who was to join me a few days later on. The river, low and clear, served my purpose well. For most of its width and much of its length, hard clay shelves spread out an inch or two below the surface. Here the current ran like a mill-race, spots to avoid on the return up stream. Every quarter-mile or so was a long hole, 50 yards by 10. Here the full measure of my longest paddle, plus the arm plunged shoulder deep, would sometimes fail to get a sounding. I mark these spots down and take their bearings, for in the main river, traversed here by steamers, snags are few and far between; the big fish, in search of shade and coolness, must lurk under the shelving edges of these channels. I anchor, and from one of these holes I take a couple of clean-run Murray trout, averaging about 5lb., good fellows to fight, and the very best size for the table.

Argus, 18 January 1913

It was on my great day that I paddled, or rather drifted, down the Murray one mild, cool January morning. Above me an opal sky, below the rushing stream, there brawling over a shoal, here crisping to a vagrant breeze, there running smooth as glass over a deep pool, never still, never silent, always sucking and gurgling, bubbling and sighing, whispering its messages to the vacant fancy.

It was a voyage of discovery. Never before had I wetted line in the reaches I was about to fish. I was breaking ground for a friend who was to join me a few days later on. The river, low and clear, served my purpose well. For most of its width and much of its length, hard clay shelves spread out an inch or two below the surface. Here the current ran like a millrace, spots to avoid on the return upstream. Every quarter-mile or so was a long hole, 50 yards by 10. Here the full measure of my longest paddle, plus the arm plunged shoulder deep, would sometimes fail to get a sounding. I mark these spots down and take their bearings, for in the main river, traversed here by steamers, snags are few and far between; the tug fish, in search of shade and coolness, must lurk under the shelving edges of these channels. I anchor, and from one of these holes I take a couple of clean run Murray trout, averaging about 5lb, good fellows to fight, and the very best size for the table.

Argus, 18 January 1913

Figure 15.1 The Central Murray River Catchment showing major waterways and key localities

15.1 Early European Accounts

The Central Murray River catchment comprises the Murray River and a number of anabranch systems including the Edward, Wakool and Little Murray Rivers, as well as the Yulupna and Gunbower Creeks. It roughly encompasses the stretch of the Murray River where it leaves the foothills of the Great Dividing Range near Albury, to where it encounters its last major tributary, the Darling River, near Wentworth. Dotted along the course of these streams are wetlands. These include Lakes Moira, Barmah, Kow Swamp, the Kerang and Hattah Lakes, as well as innumerable small lakes and billabongs. Near Echuca, the Murray River originally flowed a little to the north of its current course, with the Goulburn River following the present course of the Broken Creek. Uplifting at the Cadell Fault about 15,000 years ago resulted in various changes to the nearby rivers, including the formation of a very large lake near Barmah which became the confluence of the Murray and Goulburn Rivers. At this time the Murray River was diverted further north, roughly following the path of the Edward and Wakool Rivers, re-joining its present course downstream of Swan Hill. Eventually, the Goulburn River was diverted west and flowed through Echuca to join the original Campaspe River. About 8,000 years ago the Murray River broke through the lake near Barmah, at a site now known as the 'choke' or 'narrows', to follow the path of the Goulburn and assume its present location. The 'choke', along with the silts deposited in the lake, has effectively made the Murray River upstream higher than the surrounding plain. For some distance it is perched in a natural levee bank. It also means that considerable water is diverted out of the Murray River into the Edward-Wakool anabranch system (Gippel & Lucas, 2002).

By the late 1820s the question of the ultimate destination of the inland rivers remained unresolved. Did they nurture an inland sea or terminate on the coastline? In 1829 Captain Charles Sturt led an expedition down the Murrumbidgee River by boat in order to determine its fate. On the 14th of January 1830, Sturt's party reached 'a broad and noble river' which Sturt named in honour of Governor Sir George Murray (Sturt, 1833). Continuing downstream, on the 9th of February 1830 the expedition reached Lake Alexandrina and finally solved the riddle of the destination of the inland rivers. In perhaps the greatest feat of exploration of the inland, the members of expedition rowed their boat from the Murray mouth back upstream along the Murray and Murrumbidgee Rivers to near Narrandera. They replenished their supplies and returned to Sydney (Sturt, 1833).

Sturt made a few references to the fish he encountered during the expedition such as 'The only fish we could take was the common cod or perch; and without sauce or butter, it is insipid enough. We occasionally exchanged pieces of iron hoop for two other kinds of fish, the one a bream, the other a barbel' (Sturt, 1833). The two latter species named by Sturt were probably Silver perch and Catfish. Six years later, Major Thomas Mitchell on his third expedition traced the Murray River upstream from the Darling River and somewhere between that point and Robinvale recorded (on the 28th of May 1836) catching 'some good cod-perch (Gristes Peelii), one weighing seventeen pounds' (Mitchell, 1838). Mitchell also recorded there were large plains of reeds that existed near Swan Hill, named as a consequence of the calls at night of large numbers of birds nesting on the reeds and preventing his sleep. It was in stark contrast to the timbered country he traversed elsewhere on the Murray (Mitchell, 1838). During 1838 Sturt, overlanding stock to Adelaide, followed the Murray River from Albury downstream, and as a consequence demonstrated that it was the same river as that which the Murrumbidgee flowed into. Along the way he passed through the two largest stands of red gum forest in the Murray-Darling Basin, namely the Barmah and Gunbower Forests. His journal records considerable detail about the environment and the indigenous people who were suffering from the ravages of small pox at that time (Sturt, 1990).

From the 1840s squatters took up land along the Central Murray, one of the earliest being Edward Curr near Barmah in 1841. Curr published a biography describing the environment, the indigenous people and their fishing practices of the Barmah region, including the construction of extensive wooden fish traps (Curr, 1883). The traps resembled the wooden pens used to contain stock and Thomas Mitchell, who first observed them near Swan Hill in 1838, called them 'boughyards'. This name was later applied not only to these structures, but to a locality near Barmah where they formerly existed (Mitchell, 1838; Briggs, OH 70; Don Briggs, pers. com.). Further downstream the scene described by Mitchell greeted Peter Beveridge when he settled at 'Tyntyndyer' near Swan Hill in 1845:

> In the Swan Hill district the Murray River runs through an immense area of reedy plains. On the immediate banks of the river, for as far as these reedy plains extend, there is an artificial looking dike, having an elevation of three or more feet above the plains which shelve away behind it, consequently when the whole of these plains are inundated (which they are five months every year, from August to January inclusive) the dykes referred to act the part of dams, and so prevent the water from receding too rapidly / Whilst the waters cover the reedy plains for miles on every side, the various kinds of fish find delectable grounds in the shallow, semi-tepid fluid wherein to pursue the prey upon which they feed / When the waters have receded from the reedy plains behind every weir, fish of all kinds are left by thousands to rot and fester in the sun / (Beveridge, 1889).

Beveridge wrote an extensive account of his experiences near Swan Hill, providing great detail on the early environment and the customs and lifestyle of the aborigines, including their fishing practices. In local lagoons he observed the indigenous people hauling nets writing 'We have on many occasions seen as much as half a ton weight of fish drawn from Murray lagoons at one haul, consisting of cod, perch (golden and silver), cat-fish, blackfish, and turtle'. From regional lakes he observed them capture perch, Catfish and 'occasionally a monster cod'. In the Murray River itself they caught either by spear or line fishing 'the voracious codfish, the brilliant golden perch and his silver-scaled congener, together with the ugly, but at the same time the lusciously oleaginous catfish' (Beveridge, 1889).

Following the squatters were naturalists such as Wilhelm Blandowski, zoologist for the Victorian Museum of Natural History, who journeyed down the Murray River from Gunbower to Wentworth, establishing a camp at Chaffee's Landing near Merbein in 1857. He lodged the specimens he collected with the museum and presented his findings to the Philosophical Society of Victoria in 1858. He published an account of the nineteen types of fish he encountered during the expedition, including some detail on their habits (Blandowski, 1858). Of the larger native species he provided good descriptions of Murray cod, Trout cod, Golden perch, Silver perch, Catfish and Blackfish. His description of the smaller native species, including rainbowfish, Galaxiids, perchlets and hardyheads remains an invaluable early record. In 1862, George Burnell and Edward Cole, two failed miners on the Bendigo goldfield, sought an alternate means of income by creating photographs of residents and scenes along the Murray River and selling them. Travelling in an open boat from Echuca to Goolwa they created 60 pairs of stereoscopic images, most of which have survived and reside in the Art Gallery of South Australia (*Stereoscopic views of the River Murray*). The photographs preserve scenes of the Central and Lower Murray River prior to significant changes by Europeans. One image is probably the oldest photo of fish from the basin and contains what is likely to be a pair of Murray cod (*Stereoscopic Views of the Murray River,* No. 60, Artist's Boat).

Initially used as a direct source of sustenance by the squatters, some people eventually adopted the career of being commercial fisherman, supplying fresh fish to people in the growing townships. The formation of the Moira Lake Fishing Company (later known as the Murray River Fishing Company) by Joseph Waldo Rice in 1855 started broad scale commercial operations to supply distant markets, initially Bendigo (Priestley, 1965). An

early newspaper article provided a snapshot on the diverse types of fish captured in the region worked by the company:

> Herring, silvery white, shape of dace; cockerling, like bream in body, with head like cod – this fish sometimes reaches eleven or twelve pounds in weight; jew-fish, catfish, or eelfish found mostly in lagoons and branches; black-fish; turtle; Murray cod, three species, different shapes; bream, two varieties, gold and silver; lampreys, scarce; lobsters; prawns (*Sydney Morning Herald*, 14 November 1868).

The Murray River Fishing Company eventually diversified its activities, including harvesting medicinal leeches and supplying juvenile native fish to acclimatisation societies for translocation elsewhere. In 1862, 200 cod were transferred from the Murray River to the Nepean River near Sydney (*Sydney Morning Herald,* 19 December 1862). Following Edward Wilson's initial translocations of cod and Macquarie perch into the Yarra Catchment, more cod were sought to help establish the population. Large numbers of 'codfish' were obtained from the Murray River and placed in the Yan Yean Reservoir on the Plenty River near Melbourne, and some were forwarded to England (Acclimatisation Society of Victoria, 1864; *Argus,* 18 February 1864, 11 March 1873). Other translocations of native fish from the area included Bony Herring and Murray crayfish to the Yarra River (*Argus,* 4 July 1861, 17 September 1920), Murray cod, 'trout' (Trout cod), 'bream' and 'perch' to the Avoca River (*Riverine Herald,* 9 March 1870; *Argus,* 16 November 1870, 14 April 1873), cod and perch to mining dams near Castlemaine (*Riverine Herald,* 23 March 1864), and native fish to Lake Wendouree near Ballarat (*Argus,* 30 May 1876) and Tasmania (*Riverine Herald,* 30 March 1864). In the twentieth century, thousands of juvenile cod, perch and 'bream' trapped in waterholes along the Spurr Creek on Gunbower Island were relocated to other unidentified waters (Marett, 1943) and in 1957 540 Golden perch were transferred from the Murray River at Euston to Chiffley Dam near Bathurst (Lake, 1959).

While the Murray River Fishing Company developed the transport of fresh fish from the Murray River to distant towns, many fishermen worked the river to meet the local populace's needs for fish. The activities of both commercial and recreational fishermen were frequently recorded in regional newspapers indicating an astonishing abundance of fish in the early years. At Wahgunyah the Murray River was described as being:

> literally alive with codfish, bream, perch, and a small fish much like a schnapper. Mr. Coombs, an enterprising man, has made a start in the matter, and as fast as he can, single-handed is supplying these diggings with fish. He brings them in every Thursday evening, and, as may be supposed, there is a rush for them, particularly the small fish, bream, perch, and schnapper, weighing from 1lb. to 41b (*Argus*, 2 November 1860).

The Central Murray was a Mecca for anglers from an early time. In 1913, a lengthy article described the joy of a day's fishing on the Murray River including the capture of Trout cod, Silver perch and Murray cod:

> I anchor, and from one of these holes I take a couple of clean run Murray trout, averaging about 5lb., good fellows to fight, and the very best for the table. / Light rod and small hooks are brought into play: the bait is shrimp and worm. Again I draw a prize; is it not my great day? I spend a rapid half hour with Murray bream up to a couple of pounds. Bit and dash and wriggle, jump and dive, and away again; then yielding up the ghost in the bottom of the boat with their peculiar grunt. / Hardly is this line rebaited than it is taken freely and well; and a hundred heartbeats later I have landed a nice cod of about 7lb. weight (*Argus*, 18 January 1913).

When the fish were biting, angling parties took catches weighing hundreds of pounds. In 1927, one group landed 200 lb. (90.7 kg) of 'Murray cod, grunter, golden perch and Macquarie perch' (*Argus,* 1 January 1927). Another party in 1954 at Barmah landed 600 lb. (272.2 kg) of fish, of which 300 lb. (136.1 kg) were cod and the balance 'perch' and 'redfin'. The largest fish was the famed 'Bow Yard Annie' a 110 lb. (49.9 kg) Murray cod

well known to Barmah residents (*Riverine Herald,* 7 December 1954). Apart from the river, prolific fish captures also occurred from the various lakes swamps, billabongs and creeks adjacent to it. At Lake Moodemere near Corowa, one person in 1895 took a 'barrow load' of fish in nets (*Argus,* 11 January 1895). In one month at Kow Swamp, commercial fisherman F. J. Marett landed over 4000 lb. (1814.4 kg) of Murray cod up to 95 lb. (43.1 kg) in weight. On another occasion, in five days, he caught twelve fish averaging 50 lb. (22.7 kg) (Marett, 1943). Kow Swamp was also notable for producing large Golden perch, including the largest ever recorded weighing 54 lb. (24.5kg) cleaned, which was taken by professional fisherman William Davies in February 1938 (Roughley, 1955).

Towards the end of the nineteenth century concern was expressed for the Murray River fishery and various investigations took place reviewing its status. In the 1890s Victoria ended the commercial fishery in rivers, though it continued in lakes until the late twentieth century. In 1900, an inquiry in South Australia and a meeting held in Melbourne between representatives from South Australia, New South Wales and Victoria collated the known information on the biology of native fish such as the size at sexual maturity and spawning seasons. As a result, regulations were introduced across the three states encompassing size limits and closed seasons to conserve native fish stocks with some variations between the states reflecting local conditions (Dannevig, 1903; *Sydney Morning Herald,* 25 April 1903). In 1901, NSW State Fisheries introduced size limits for all native and introduced freshwater fish species. Subsequently a three month closed season from September to November was introduced, when the inland native species could not be kept (NSW Fisheries Reports, 1901, 1904, 1907). Local permanent closures to commercial fishing also occurred near towns, to placate the concerns of recreational anglers; other sections of the river were later closed to provide protected breeding areas for the fish (NSW Fisheries Report, 1892; *Sydney Morning Herald,* 2 September 1904; Cadwallader, 1977). Further interstate conferences on managing the fishery were held in Melbourne in 1905 (*Argus,* 5 August 1905), Wagga Wagga in 1907 (*Argus,* 28 October 1907) and in Melbourne in 1936 (*Adelaide Advertiser,* 7 October 1936, 10 October 1936).

The Central Murray became the focus of research on the biology of native fish by Victorian investigators with the support of NSW State Fisheries. In 1937, John Tubb conducted survey work in the Barmah Lakes area, as well as attempting the artificial propagation of a number of species. He stripped and fertilised the eggs of Murray cod, Trout cod and Macquarie perch (Cadwallader, 1977). Tubb succeeded in producing a total of four juvenile Murray cod, and his success prompted proposals to utilise the Barmah Lakes as a source of broodstock for the artificial propagation of native fish (*Argus,* 4 December 1937, 14 January 1938, 4 October 1938, 6 May 1939, 19 December 1939). Apparently the commencement of the Second World War led to the abandonment of the Barmah project. After the war further efforts were made, and in 1954 Murray cod were captured near Mildura and flown to the Snobs Creek Hatchery near Eildon in an attempt to strip eggs from the fish (*Argus,* 19 October 1954).

Between 1949 and 1952 Colonel John Langtry conducted an extensive survey of the fish populations of the Central Murray (Cadwallader, 1977). He recorded the state of the fishery, relying heavily on information sourced from commercial fishermen, Inspector Arnold Arentz at Swan Hill and George Clarke at Barmah. Clarke had been a fishing inspector and commercial fishermen, with experience going back over thirty years. In addition, Langtry conducted netting surveys in the Murray River and nearby lagoons from Corowa downstream into South Australia. Langtry's work was not published until 1960, and then only as an internal manuscript which was circulated to a few government employees. In his report Langtry reached the conclusion that Trout cod was a separate species to Murray cod. John Lake received a copy of Langtry's report and relied heavily upon it in formulating his research on the biology of native fish. In 1977 an edited version of Langtry's report was published and became widely available (Cadwallader, 1977).

Photograph 15.1 Central Murray Beach

Photo UMA/I/5112. A group fishing a beach on the Murray River c1920 probably in the Yarrawonga area. Beaches of coarse sand were a prominent feature of the rivers of the eastern lowlands such as the upper Central Murray River. Reproduced with permission from the W. J. Howslip Collection, *University of Melbourne Archives*.

Photograph 15.2 Yorta Yorta Fish Traps

Photo MR106. For thousands of years the indigenous *Yorta Yorta* people lived near Barmah sustained by the rich resources of the river. They constructed elaborate structures to collect fish described as 'bough yards' when observed by Sir Thomas Mitchell near Swan Hill in 1838. This term gave rise to the name of one location on the river near Barmah where some were located. Don Briggs, a *Yorta Yorta* elder, whose father worked as a professional fisherman, created this picture from his boyhood memory of how the bough yards were constructed. Painting courtesy of Don Briggs.

15.2 The Past Distribution of Fishes in the Central Murray River Catchment

Due to the length of the Murray River, the *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the river into three separate catchments. The Central Murray Catchment was nominated as the area existing downstream of the wall of Lake Hume, encompassing the river and its anabranches to Lock 10 near Wentworth. Along its length this section of the river flows at an altitude below 200 m ASL, identifying it as lowland habitat, though some tributary streams upstream of Walbundrie exceed 200 m ASL, placing them in slopes habitat. The audit divided the Central Murray Catchment into three zones (upper, middle and lower) based on how the waterways were managed, rather than altitude or habitat differences. The map published in the audit did not clearly delineate the boundaries for these zones - they were an upper zone roughly upstream of Yarrawonga, a middle zone between Yarrawonga and the Wakool River junction, and a lower zone downstream from the Wakool River to Lock 10. From the map in the audit it was not clear whether the 'upper' zone included the Murray River, or simply the tributary streams forming the headwaters of the Billabong Creek to the north of Albury.

The Murray River upstream of West Wodonga flows through a confined valley with extensive coarse gravel substrates indicating the commencement of slopes type habitat at this point. The short section upstream of West Wodonga to Hume Dam was reviewed in the section on the Upper Murray River Catchment. The discussion that follows relates to the lowland habitat from West Wodonga to Lock 10, though some descriptions of fish populations in the Albury area have been included to help clarify species presence and abundance in the upper Central Murray. The northern anabranch system encompassing the Edward and Wakool Rivers and their tributaries the Billabong and Yanco Creeks are discussed separately in the section on the Riverina Catchment. The rarity scores used in the audit for the upper zone appear to apply to the upper Billabong Creek, and so have not been used here. Historical evidence suggests that distinctive changes occurred in the abundance of some fish species downstream of Echuca and, as a result, the central lowland zone has been divided into eastern and western sections for the purpose of allocating rarity scores. Overall, four zones have been used in the following discussion: an upper lowland zone (Wodonga to Yarrawonga), an east middle lowland zone (Yarrawonga to Echuca), a west middle lowland zone (Echuca to the Wakool River junction) and a lower lowland zone (Wakool River junction to Lock 10).

The information presented below was sourced from many detailed newspaper accounts, information recorded in the Annual Reports of NSW State Fisheries, museum records, the works of early naturalists and the observations recorded by Tubb and Langtry (Cadwallader, 1977). An extensive oral history was collected for this catchment (OH 61-77), with most of the research concentrating in the area between Yarrawonga and Swan Hill. Valuable information obtained from commercial fishermen during the early 1980s, namely Bill Ellis at Borrhaman, Wallace 'Laddie' Clifford at Barmah, and members of the Beggs family near Robinvale have also been included. A significant number of old photographs of catches of native fish in this catchment have been located. Further work collecting oral history from the lower reaches of this catchment is warranted.

15.2.1 Upper Lowland Zone

The Murray River downstream of Albury experienced an environmental catastrophe during the early 1930s when copper sulphate treatment of the newly constructed Hume Weir caused repeated massive fish kills. It was reported that after this treatment native fish populations were essentially exterminated near Albury (Rhodes, 1999). Langtry recorded that as far downstream as Brimin, native fish were affected. As late as 1950 some species had not recovered, while others remained diminished in abundance compared to their levels prior to the treatment (Cadwallader, 1977). Due to the drastic change to fish populations that took place in

this reach c1930, assessment of species abundance in this zone highlights accounts of the fish fauna originating prior to this time.

Cod were originally abundant in the upper Central Murray River and supported a significant commercial fishery. Near West Wodonga cod were the type of fish most frequently taken by anglers (McFarlane, OH 53), and at Wahgunyah the river was described as being 'literally alive' with cod (*Argus*, 2 November 1860). Large numbers of cod up to 120 lb. (54.4 kg) in weight were taken at Corowa (*Sydney Morning Herald,* 8 November 1875; NSW Fisheries Report, 1929) and at Rutherglen (*Argus,* 24 March 1896). Fish up to 82 lb. (37.2 kg) being caught near Howlong (*Argus,* 9 April 1938) and one of 105 lb. (47.7 kg) near Gooramadda (*Argus,* 18 May 1912). In lagoons in the Wodonga area Murray cod were common (McFarlane, OH 53; *Sydney Morning Herald*, 8 February 1907; *Argus*, 16 February 1912; NSW Fisheries Report, 1929), and at Hawkesview Lagoon near Albury cod as large as 40 lb. (18.14 kg) were present (NSW Fisheries Report, 1929).

During a survey in 1928 'almost every day numerous Murray cod and trout cod' were captured, and running ripe female Trout cod were stripped of their ova (NSW Fisheries Report, 1928). A good quality photograph of a catch of six cod taken just upstream of Howlong c1930 includes Trout cod which may have been half of the catch (Photo MR71). Their presence is recalled in oral history at Wodonga (McFarlane, OH 53), Howlong (Handorf, OH 61; Rutzou, OH 40) and just upstream of Yarrawonga (Aitchison, OH 62). In 1950, Langtry collected Trout cod at three locations between Corowa and Brimin. At one site, the number of Trout cod taken exceeded that of Murray cod (Cadwallader, 1977). During the early 1960s, John Lake captured a number of Trout cod from the Murray River near Brimin (Vick Pay, pers. com.) and a photo was subsequently published of one fish (Lake, 1967b, 1971). The available evidence suggests that both Murray cod and Trout cod were abundant in the upper Central Murray River from West Wodonga to Yarrawonga, though Trout cod were absent in lagoons (McFarlane, OH 53; Cadwallader, 1977).

Macquarie perch were described as 'plentiful' during the survey near Albury in 1928. Golden perch were recorded as being caught 'at intervals', and catches of up to 11 Silver perch a day taken. On one occasion, at one location, 20 adult Macquarie perch were taken (NSW Fisheries Report, 1928). In the 1890s at Wodonga West in the Murray River and lagoons, Golden perch and Silver perch were recalled to have been present in 'significant numbers' (McFarlane, OH 53), though Macquarie perch were considered to be more common (Jack Rhodes, pers. com.). A very early newspaper account described the Murray River near Wahgunyah as 'alive with codfish, bream, perch, and a small fish much like a schnapper' the latter probably referring to Macquarie perch (*Argus*, 2 November 1860). Silver perch were regularly taken near Howlong up to the early 1930s (Handorf, OH 61). Macquarie perch were specifically recorded near the Ovens River junction in a newspaper account, along with Silver perch up to 7 lb. (3.2 kg) in weight (*Argus,* 14 January 1939). A single Silver perch was taken by Langtry near Brimin in 1950 (Cadwallader, 1977). At Yarrawonga all three perch species were present (Aitchison, OH 62). Between Albury and Yarrawonga there are significant variations reported in the relative abundance of the three types of perch. Overall, the evidence suggests that Macquarie perch had been abundant, and that Golden perch and Silver perch were common in the upper reaches of the upper Central Murray River near Wodonga. In the lower reaches near Yarrawonga, all three species were very common to abundant.

A newspaper account recorded Catfish being present in lagoons near Albury (*Sydney Morning Herald*, 8 February 1907), and oral history recalls captures in the river itself at Doctors Point near the town (Grant, OH 55; Roy Grant, pers. com.). Catfish were present in lagoons near Wodonga West (McFarlane, OH 53) and were taken in the Barnawartha area (*Argus*, 7 March 1935). Catfish up to nine pounds were abundant in lagoons near Yarrawonga, where nests were observed amongst reeds, but were rare in the river itself (Aitchison, OH 62). Overall, Catfish were comparatively rare in the main channel of the upper Central Murray River, but

abundant in lagoon habitats. The only written account of Blackfish in this zone was provided by Ogilby (1913) who reported that they were common in lagoons near Albury. In the early twentieth century they were common in the river itself near Wodonga (Jack Rhodes, pers. com.), and as they were considered to be very common downstream in the Tocumwal area (Vidler, OH 66), they were probably originally common in the upper Central Murray River.

An unusual fish reported at Corowa in 1914 was probably a Spangled perch (*Argus,* 24 April 1914), while another account records the capture of a Bony Herring between Howlong and Albury which the oldest residents had not seen previously (*Argus,* 3 June 1864). A newspaper account suggested that Lampreys, probably Short-headed lampreys (Lintermans, 2007), may also have been present near the Ovens River junction, though there is no conclusive evidence (*Argus,* 12 April 1921). A colony of seals was present at Lake Moodemere near Corowa (*Argus,* 29 April 1865).

15.2.2 Middle Lowland Zone

Cod were abundant in the middle Central Murray with fish as large as 250 lb. (113.4 kg) being reported (*Argus,* 20 May 1857), and in 1868 a large cod at Tocumwal attacked a person swimming in the Murray at night, nearly drowning him (*Argus,* 7 May 1866). In the winter months the catch of fish in the Barmah area was about 'ten hundred weight a week', but in the warmer months two to three tonnes per week was the expected catch (*Argus,* 29 July 1862). In one day half a tonne of cod was delivered to the market in Melbourne (*Argus,* 14 August, 1857). Near Cobram a commercial fisherman is recorded to have taken out of the Murray River 160 Murray cod up to 125 lb. (56.7 kg) in weight in a single season (Dick, OH 68). At Beveridge Island, downstream from Swan Hill, the Davies family captured 346 Murray cod in one season (Davies, OH 75).

Cod were also abundant in the creeks adjoining the river. During a three week survey in October 1937, 152 Murray cod were captured in the Budgee Creek near Barmah (Cadwallader, 1977). Murray cod were abundant in the Gunbower Creek with fish up to 100 lb. (45.4 kg) being taken (*Argus,* 31 May 1911, 7 March 1935), cod up to 90 lb. (40.8 kg) were caught from Gap Creek near Cohuna (*Argus,* 16 February 1938), and very small cod were abundant in ephemeral creeks on the Gunbower Island such as Spurr Creek (*Argus,* 21 March 1935). In the Eagle Creek near Barham, a photograph records nine large Murray cod captured with pitchforks when a hole was pumped dry for irrigation (Barham Historical Society collection). They were common in irrigation channels near Swan Hill (*Argus,* 7 July 1922) and abundant in the Merran Creek (McDonald, OH 74; *Argus,* 12 August 1924). On one occasion, a net dragged through a small hole in a creek about two feet deep on Murray Downs station near Swan Hill captured 12 cod weighing a total of 90 lb. (40.8 kg) (*Argus,* 30 June 1922, 12 August 1924). Cod were present in lagoons near Swan Hill (Beveridge, 1889) and regional swamps and lakes such as Kow Swamp supported big populations including large fish up to 105 lb. (47.6 kg) (*Argus,* 21 August, 1937, 13 January 1938; Marett, 1943).

Aboriginal people along the Central Murray recognised that there were two types of cod and used different names for them. In the Wemba Wemba language of the Swan Hill area, the Murray cod was known as 'Pandyil' and very large specimens as 'Kurrumerruck', while the 'Murray trout' were referred to as 'Ngumel' (Hercus, 1992). Further upstream in the Barmah area the Murray cod was known as 'Burnanga', while the 'trout' (Trout cod) was known as 'Bangami' (Bowe & Morey, 1999). An extensive body of evidence from a variety of sources indicates that Trout cod were abundant upstream of Echuca. From an early date newspapers record the existence of 'Murray trout' or simply 'trout' in the Barmah fishery (*Argus,* 13 September 1859, 25 July 1888), and in 1897 'trout' were listed as one of the regular species taken in the Barmah region (NSW Fisheries Report, 1897). One good quality photo records their capture between Tocumwal and Barmah (Photo: MR27), with another poorer quality image possible recording their capture near Cobram (Photo: MR29). The oral history

recalls that Trout cod had been very common near Barmah (Clifford, OH 72; Norris, OH 71; Laddie Clifford, pers. com.) and they were captured by Tubb in the nearby Budgee Creek in 1937 (Cadwallader, 1977). Further upstream between Yarrawonga and Tocumwal, in preferred locations of faster flowing water, Trout cod matched Murray cod in abundance (Roberts, OH 63; McKenzie, OH 64; Norris, OH 71). Aboriginal people considered the species to prefer the habitat well upstream of Barmah (Briggs, OH 70). Langtry described Trout cod as being 'reasonably plentiful' near Barmah; while further upstream at Burramine, the catch rivalled that of Murray cod, with fish up to 25 lb. (11.3 kg) being taken in his survey in 1950 (Cadwallader, 1977).

Below Echuca one Trout cod museum specimen was sourced near Swan Hill in 1877 (Berra, 1975) and four others were collected in that area around 1950 (*Australian Museum* database). The latter were captured by professional fishermen William Davies and Bob Brutten at the request of NSW State Fisheries inspector Arnold Arentz who forwarded them to Theodore Roughley (Henry Davies, pers. com.; Roughley, 1955). Newspaper accounts reported 'Murray trout' being taken or present near Kerang and Swan Hill (*Argus*, 3 March 1911, 15 October 1920). Oral history recalls that Trout cod were less common below Echuca than upstream (Clifford, OH 72; Jones, OH 65; Laddie Clifford, pers. com.), though in specific reaches of river they were locally very common. Regular captures occurred near Torrumbarry (Daws, OH 99), Cohuna (Wilson, OH 73), Murrabit (McDonald, OH 74), Nyah (O'Connor, OH 111) and Wood Wood (Davies, OH 75), and they were fairly common at Pental Island upstream of Swan Hill (Davies, OH 75). While present in the nearby Murray River, Trout cod have not been reported from the Gunbower Creek (Wilson, OH 73).

In 1950, Langtry concluded that at that time 'the numbers of Trout cod taken increase from one or two fish at Swan Hill to a maximum below and above Yarrawonga weir' (Cadwallader, 1977). During the early 1980s a number of old commercial fishermen informed the author that Trout cod around the First World War had a patchy presence downstream of Echuca where they were always reported being captured in faster stretches of water running over what were described as rocky reefs. Specific locations mentioned were Murrabit, Pental Island, Vinifer and the 'Bitch and Pups' (just upstream of the junction of the Wakool River). Collectively the evidence suggests that Trout cod were abundant upstream of Echuca and less so downstream, though they were common in the lower reaches of this zone in preferred habitat.

Upstream of Echuca Macquarie perch were very common to abundant. They were regularly taken near Tocumwal (Vidler, OH 66), and were considered to be very common at Yulupna Island (Reynolds, OH 69) and at Barmah (Briggs, OH 70; Norris, OH 71; Laddie Clifford, pers. com.). Langtry reported the species to be 'reasonably plentiful' at Barmah in 1950; that large numbers were present in the Gulf Creek; and, during netting in the Murray River near Burramine, Macquarie perch were the second most commonly captured species, also being present in adjacent lagoons (Cadwallader, 1977). John Tubb stripped and artificially fertilised eggs from running ripe Macquarie perch captured near Barmah between September and November 1937 (Cadwallader, 1977), and they were observed to spawn on the coarse sands and cobbles in creeks near Barmah including the Gulf Creek (Laddie Clifford, pers. com.). The evidence of Tubb and Clifford suggests the Barmah Lakes population may have been self-supporting.

Below Echuca a newspaper account reported that a 'Macquarie perch' weighing 18 lb. (8.2 kg) was taken from the Merran Creek (*Argus,* 18 July 1924, 7 July 1925) but the correspondent may have confused the species with Silver perch so the record is uncertain. A fish taken at Koondrook in 1931 was confirmed as a Macquarie perch, with a museum identifying the specimen. The account implies that this was not an isolated capture (*Argus*, 18 December 1931). They were regularly taken at Pental Island, with occasional captures occurring at Beveridge Island, downstream of Swan Hill (Davies, OH 75). In 1950, Langtry wrote that 'Torrumbarry Weir seems to be the downstream limit of Macquarie perch' though he noted that near Barham, Cohuna and Gunbower 'it is said that Macquarie perch are returning to the area'. He concluded that from Torrumbarry

'they gradually increase in numbers upstream to just below Yarrawonga Weir' (Cadwallader, 2007). Roughley reported an increase in the number of Macquarie perch being caught between Torrumbarry and Swan Hill during the early 1950s, speculating that heavy rains had flushed them out of lagoons and into the river (Roughley, 1955). Overall, Macquarie perch appear to have been very common to abundant between Yarrawonga and Echuca, but downstream of Echuca, while regularly taken were comparatively scarce.

Golden perch were common near Yarrawonga (Aitchison, OH 62; Charlie Aitchison, pers. com.), and at Burramine they were the most abundant species taken in the river in one survey. They were also recorded in lagoons (Cadwallader, 1977) and were commonly captured near Cobram (Dick, OH 68; Vidler, OH 66). After floods they were abundant at Yulupna Island (Reynolds, OH 69). At Barmah, large catches were taken with fish up to 32 lb. (14.51 kg) being reported (Briggs, OH 70; Clifford, OH 72; Photos: MR37, 38, 45, 97, 101). Fish up to 34 lb. (15.4 kg) were captured near Torrumbarry (Daws, OH 99). Langtry considered the species to be plentiful at Barmah, though less so towards Yarrawonga (Cadwallader, 1977). Blandowski (1858) recorded that Golden perch were found both in the river and billabongs in the Gunbower area. They were abundant in the Gunbower Creek near Cohuna, with fish up to 17 lb. (7.7 kg) being taken (Wilson, OH 73). Small Golden perch were present in the nearby Spurr Creek (Marett, 1943). In Kow Swamp, fish up to 54 lb. (24.5 kg) were taken (Davies, OH 75; Roughley, 1955). Beveridge (1889) recorded the species to be abundant in the Murray River near Swan Hill, and large numbers were present in lagoons. In the Merran Creek near Swan Hill, Golden perch from eight to ten lb. (3.6 to 4.5 kg) were very common, and fish up to 16½ lb. (7.5 kg) were captured from Murray Downs Lake near Swan Hill (*Argus,* 18 July 1924). They were reliably taken in the Murray River near Nyah (O'Connor, OH 111). Overall, Golden perch were abundant in this zone of the Central Murray.

Silver perch were captured in surveys by Langtry in the Murray River near Burramine, and were common in the nearby lagoons (Cadwallader, 1977). At times, large catches were taken just downstream of Yarrawonga (Photos: MR31, 32, 73, 74), near Cobram (Dick, OH 68; Vidler, OH 66; Lever, OH 77), at Yulupna Island near Tocumwal (Reynolds, OH 69), and at Barmah (Briggs, OH 70). On one occasion a single drum net set near Stewarts Bridge upstream of Echuca captured 126 fish (Clifford, OH 72). Silver perch were present in the Spurr Creek near Gunbower (Marett, 1943) and in Kow Swamp (Photo: MR53). Large schools at times congregated at the base on Torrumbarry Weir (Cadwallader, 1977). Small Silver perch were present in such large numbers downstream of the weir that they were considered to be a pest (Daws, OH 99). Silver perch were abundant in the Murray River near Cohuna (Wilson, OH 73), at Murrabit (McDonald, OH 74) and at Nyah (O'Connor, OH 111). Beveridge (1889) recorded the species to have been abundant in the Murray River and nearby lagoons near Swan Hill. The evidence indicates that Silver perch were originally abundant along the length of the middle Central Murray River.

Catfish were recorded as being caught by aboriginal people near Barmah in 1838 (Sturt, 1990). They were very common in lagoons near Burramine and the nearby Cobrawonga Creek, a small anabranch of the Murray River (Roberts, OH 63). A very early newspaper account reported the capture of a large specimen of a Catfish from the Murray River near Echuca, noting that the species was 'very seldom found out of the backwaters and lagoons' (*Argus,* 15 January 1864). A latter account similarly reported that 'jew-fish, catfish, or eelfish' were 'found mostly in lagoons and branches' (*Sydney Morning Herald,* 14 November 1868). An early photograph records two Catfish taken from the river near Barmah (Photo: EHS3), and Langtry reported the presence of large numbers of juvenile Catfish in the Gulf Creek in the same area (Cadwallader, 1977). Oral history recalls the species to have once been abundant in the Barmah Lakes, and in the swamps near Barmah nests were regularly seen (Briggs, OH 70; Clifford, OH 72)

Catfish were regularly taken in some backwaters of the Murray River near Cohuna, and were very common in the Gunbower Creek (Wilson, OH 73; Daws, OH 99) and in creeks near Pig Swamp (Daws, OH 99). They were

also abundant in the Kow Swamp (Wilson, OH 73; *Argus,* 8 March 1927). At Murrabit, Catfish were regularly taken in the quiet backwaters of the river and were very common in the adjacent creeks (McDonald, OH 74). Near Swan Hill Beveridge recorded Catfish to have been abundant in lakes and lagoons, and witnessed captures by local aboriginal people in the Murray River (Beveridge, 1889). A newspaper account recorded captures out of the Murray River near Swan Hill of fish up to 8 lb. (3.6 kg). In the Merran Creek this size fish were common, with a 14 lb. (6.4 kg) fish being taken (*Argus,* 18 July 1924). They were also very common at Vinifer (O'Connor, OH 111). It appears that the abundance of Catfish in the middle Central Murray River varied along its length, the species being more prevalent in the slower reaches downstream of Echuca where it was most common. Upstream it was regularly taken in the river, but scarce. In lagoons and lakes Catfish were abundant throughout the middle Central Murray.

Blackfish were very common near Tocumwal (Vidler, OH 66), common in the Barmah Lakes (Laddie Clifford, pers. com.; Cadwallader, 1977; Clifford, OH 72) and were recorded near Echuca in 1868 (*Sydney Morning Herald,* 14 November 1868). Blackfish were common in creeks and were regularly taken in the Murray River at Murrabit (Ian McDonald, pers. com.). Beveridge (1889) recorded captures of Blackfish from lagoons near Swan Hill, though did not report taking them out of the river itself. A newspaper account reported that they were present in the river near Swan Hill, though were considered to be unusual (*Argus*, 30 January 1925). At times they were caught in large numbers from nearby irrigation channels (*Argus,* 7 July 1922*)*. Overall, Blackfish appear to have been historically very common in the upper reaches of the middle Central Murray, though they were less prevalent in the lower reaches of the river. Throughout the middle Central Murray, Blackfish were very common in lakes and lagoons.

Newspaper articles indicate that Lampreys, probably Short-headed lampreys (Lintermans, 2007), were found inside snags near Tocumwal and downstream near Swan Hill (*Argus,* 7 July 1905). They were present at Barmah (*Argus,* 26 May 1866) and were considered to be fairly common in the middle Central Murray, along with occasional eels (*Argus,* 12 April 1921). It is likely that they were Short-finned eels (Lintermans, 2007). An eel was angled in the Gunbower Creek (Wilson, OH 73) and eels were also reported from Murray Downs Lake near Swan Hill (*Argus,* 9 November 1920).

15.2.3 Lower Lowland Zone

Murray cod are universally reported to have been abundant in the lower Central Murray River. At Chaffeys Landing Blandowski recorded cod to have been the main fish upon which the aborigines subsisted. He described their fishing practices including how they located them at night with fire and speared them (Blandowski, 1858). Fish up to 146 lb. (66.2 kg) have been reported from near Euston (Davies, OH 75), and catches of 500 lb. (226.8 kg) a day are recorded in the fishing receipts of the Beggs family near Robinvale (Trueman, unpublished data). Twenty five miles downstream of Mildura, four anglers caught 230 lb. (104.3 kg) of cod in a day (*Argus,* 1 February, 1923). Cod were also common in Lake Mournpoul with fish up to 60 lb. (27.2 kg) being present (*Argus,* 13 January 1930).

Blandowski described the two species of cod as being 'characteristic forms of the Murray River and its tributaries', implying that the Trout cod was, like the Murray cod, widespread and common (Blandowski, 1858). The Yarree Yarree (Jari Jari) people near Merbein referred to Murray cod as 'Barnta' and Trout cod as 'Yaturr' (Blandowski, 1858) demonstrating their familiarity with the species in their lands, which encompassed the region roughly from Robinvale to the South Australian border. Stead described Trout cod as having been 'abundant' near Wentworth around 1910 (Stead, 1929b). A newspaper account records Mildura anglers stating the fish's existence in the district (*Argus,* 3 March 1911). Another newspaper account recorded the capture of a 'Murray trout' near Narrung (*Argus,* 16 May 1935). Retired commercial fisherman in the 1970s informed the

author that regular captures of 'rock cod' (Trout cod) had taken place up till the 1920s at McGraths Island near Kulkyne, and other stretches of faster water near rock bars. Langtry described the Trout cod as being 'exceedingly rare' between Euston and Mildura, and 'occasionally taken' at Boundary Bend, but did not personally capture any specimens in his survey in 1949 (Cadwallader, 1977). The evidence on the past abundance of Trout cod in the lower Central Murray is contradictory, but the early accounts suggest that the species was locally very common in areas of preferred habitat.

Newspaper articles reported the presence of Macquarie perch near Merbein, though their failure to record Silver perch suggests that it may have been a misidentification (*Argus,* 18 July 1924; 7 July 1925). Blandowski did not record their presence near Chaffeys Landing (Blandowski, 1858), and Langtry failed to catch any in the lower Central Murray River c1950 (Cadwallader, 1977). During the late 1970s, a number of retired commercial fishermen, including members of the Beggs family of Robinvale, recalled stories to the author of regularly catching small numbers of 'white eye' or 'butterfish' between Robinvale and Renmark, providing accurate descriptions of the species. Records of fish movements through the Euston Weir fish documented the passage of hundreds of Macquarie perch upstream during the period around World War Two (Cadwallader, 1977; Mallen-Cooper & Brand, 2007), and they were taken by members of the Davies family just below the weir (Davies, OH 75). Overall, on the limited evidence available, Macquarie perch appear to have had a small but significant presence in the lower Central Murray.

Golden perch and Silver perch were abundant in the river and adjacent lagoons in the lower Central Murray. Large numbers of both species used the fishway at Euston, with a total of 4,278 Golden Perch and 11,530 Silver perch being recorded between May 1938 and November 1942 (Cadwallader, 1977). At Correna Bend near Euston, a photo records a large catch of fish which includes many Silver perch (Photo: Museum Victoria, MM002624). Both species were abundant near Boundary Bend, with Golden perch comprising up to 75.6% of the catch in a survey in 1949 and Silver perch 14.3% (Cadwallader, 1977). Blandowski noted the presence of Silver perch both in the river and billabongs, and recorded three aboriginal names for the species being used for fish of different sizes (Blandowski, 1858). Both Golden perch and Silver perch were present in Lake Mournpoul (*Argus,* 13 January 1930).

Catfish were taken by Sturt's party near the Murrumbidgee River junction in 1830 (Sturt, 1833), and Blandowski captured them at Chaffeys Landing, recording fish up to 8 lb. (3.6 kg) in weight. He reported that the Catfish 'lives here in the Murray and in Billabongs' (Blandowski, 1858), indicating that the species was historically common in both types of habitat near Merbein. They were abundant in Lake Mournpoul where nests were observed (*Argus,* 13 January 1930; O'Donahue, 1915), and Langtry recorded Catfish being present in the Benanee and Dry Lakes near Robinvale, as well as in irrigation channels near Mildura (Cadwallader, 1977). One angler reported catching hundreds of Catfish from lagoons near Mildura (*Argus,* 26 February 1918). There are other accounts recording the species to have been abundant near Merbein at Cowanna Bend in both lagoons and in the river (*Argus,* 2 February 1922; 7 July 1925). Overall, Catfish were abundant in the lower Central Murray.

Blandowski recorded Blackfish being present at Chaffey's Landing and considered them to be principally found in lakes and lagoons rather than the river (Blandowski, 1858). They were recorded in newspapers as being present in lagoons at Cowana Bend near Merbein (*Argus*, 7 July 1925), with captures from the river itself near Merbein, though this was considered unusual (*Argus*, 2 February 1922). Overall, in the lower Central Murray, Blackfish were comparatively rare in the river, but very common in habitats away from the main channel such as lagoons.

15.2.4 Estimates of Native Fish Abundance in the Central Murray River Catchment at European Settlement

Presented are the rarity scores used in the *Sustainable Rivers Audit* (Davies *et al.,* 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardised survey techniques such as electrofishing. They are compared to those developed in the *True Tales of the Trout Cod* Project that uses more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 15.1 Central River Catchment Rarity Scores (Main River Channels)

	Lowland* (Wakool River junction to Lock 10)		**West Middle† Lowland** (Echuca to Wakool River junction)		**East Middle† Lowland** (Yarrawonga to Echuca)		**Upper Lowland*** (Wodonga West to Yarrawonga)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod	3	3	5	3	5	**5**		**5**
Murray cod	5	**5**	5	**5**	5	**5**		**5**
Golden perch	5	**5**	5	**5**	5	**5**		**U3**
Silver perch	5	**5**	5	**5**	5	**5**		**U3**
Macquarie perch	1	1	3	L3	3	**5**		**5**
Catfish	5	**5**	3	U3	3	**3**		L3
'Blackfish'	3	1	3	3	3	**3**		3

Key
0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type supported by multiple accounts or lines of evidence e.g. oral history, newspaper accounts, photographs

* Note: The actual boundaries of this zone as published in the *Sustainable Rivers Audit* are uncertain as it is unclear whether it includes the Murray River itself or just the headwaters of the Billabong Creek to the north. For this reason the rarity scores used in the audit have not been reproduced.

† Note: The middle lowland zone used in the *Sustainable Rivers Audit* has been divided into eastern and western halves in recognition of distinctive changes in abundances of some species.

Figure 15.2 **Historical Records for Murray cod and Trout cod in the Central Murray River Catchment**

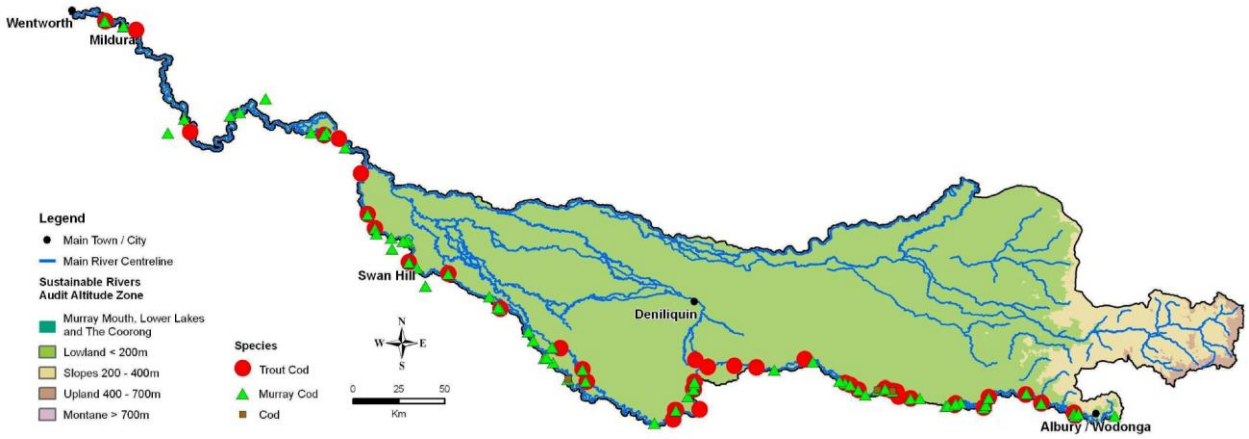
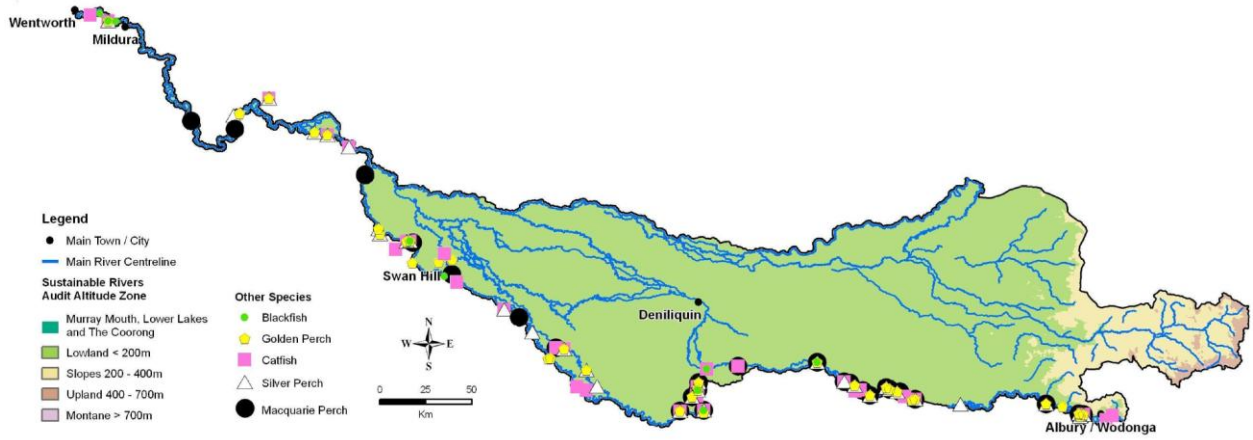


Figure 15.3 **Historical Records for Native Fish Species other than Cod in the Central Murray River**



Photograph 15.3 Howlong Cod Catch

Photo MR71: A catch of Murray cod and Trout cod taken from the Murray River upstream of Howlong c1930. Eddie Handorf is on the left with friends. The two largest fish are presented in the lower photos, the top fish being a Murray cod and the lower one a Trout cod. The fish 2nd and 6th from left are covered with spots and dashes and together with their body morphology suggests that they too are Trout cod. This photograph demonstrates that Trout cod were once at least very common in the upper Central Murray River prior to native fish populations being decimated by copper sulphate treatment of the Hume Dam. Photo courtesy of Claude Handorf.

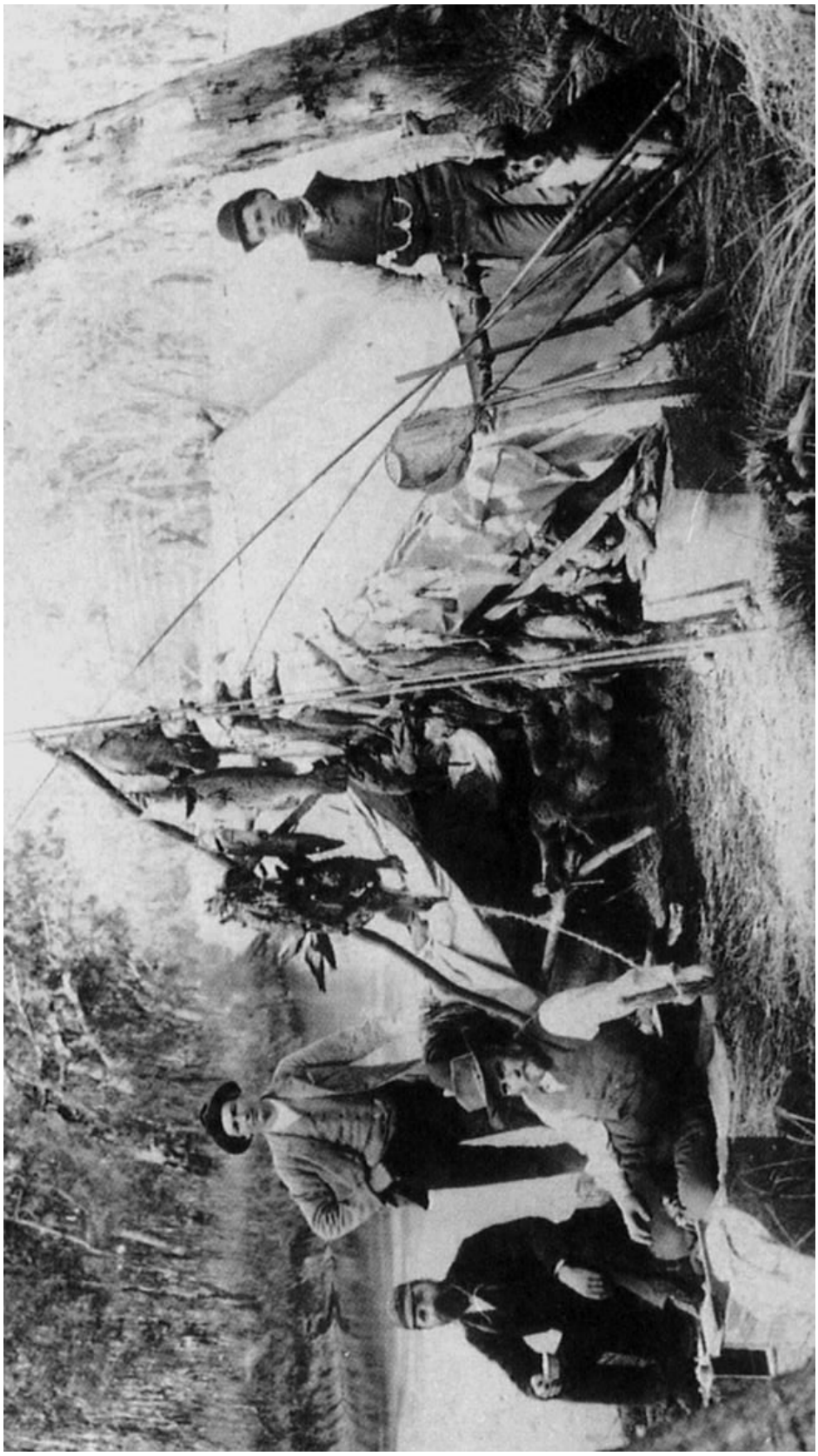
Photograph 15.4 Silver Perch at Yarrawonga

Photo MR31. Silver perch, commonly known as grunter or silver bream, were once abundant in the Central Murray. Many people did not favour them as a table fish as their edible qualities were highly variable. Commercial fisherman Wallace 'Laddie' Clifford referred to them as the 'shit of the river' because of their scavenging feeding traits and as a nuisance in netting operations. The fact that they were less sought after than Murray cod or Golden perch resulted in them being rarely photographed. This catch was taken from the Murray River at Bruce's Bend near Yarrawonga in 1951. Today Silver perch fed on high quality diets are a highly valued aquaculture fish. Photo courtesy of Jim Masters.

Photograph 15.5 Trout Cod at Tongalong

Photo MR27. Left: A catch of cod from the Murray River at Tongalong Beach, near Bearii, 1938. At right is Keith Renyolds while on the left is a member of the Ballantyne family. Below: Close up of part of the catch. Two of the fish, 1st and 3rd from the left in the right photo, display the markings of Trout cod, the former exhibiting distinctive body morphology. Photo courtesy of Tim Cole

Photograph 15.6 Early Barmah Catch



This photograph contains images of at least four native fish species. Believed to date c1870 from the Barmah area, visible is a cod, a Golden perch and several Catfish near the top of the A-frame. Silver perch lie near the top of the right flap of the tent and on the box at the lower right (forked tails). The photo also depicts the habitat and natural state of the river at an early date with perhaps the only major change being the recent removal of snags from the river. Original photograph from the Sinclair family, courtesy of Helen Coulson of the *Echuca Historical Society*.

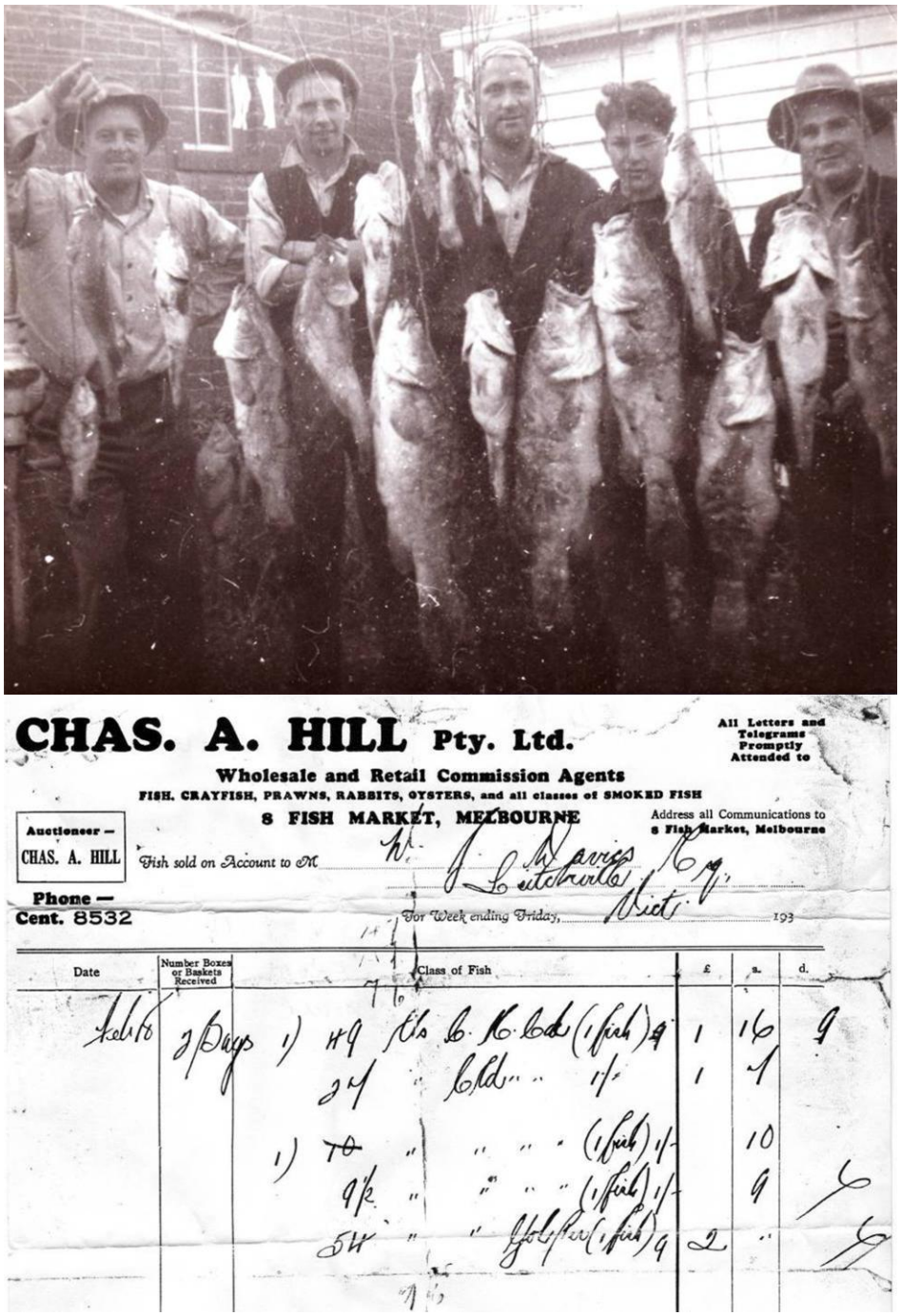
Photograph 15.7 Golden Perch at Barmah

Photo MR38. A catch of Golden perch from the Murray River just downstream from Deep Creek near Barmah c1955. Golden perch were abundant in most the Central Murray River including lakes and lagoons. They were a staple of the amateur and commercial fishery but disappeared upstream of the Yarrawonga Weir after its construction in 1939.Photo courtesy of Ramon and Max Clifford.

Photograph 15.8 Early Echuca Fishing Party

Photo EHS 1. Photo of a fishing party at Echuca c1890. Lying on the ground near the centre of the photo is Dick Greville. The catch appears to consist primarily of Murray cod though the head of one fish held by the man behind the boy at left has features suggesting that it could be a Trout cod. Image courtesy of the *Echuca Historical Society.*

Photograph 15.9 Kow Swamp Catch



CHAS. A. HILL Pty. Ltd.

All Letters and Telegrams Promptly Attended to

Wholesale and Retail Commission Agents

FISH, CRAYFISH, PRAWNS, RABBITS, OYSTERS, and all classes of SMOKED FISH

8 FISH MARKET, MELBOURNE

Address all Communications to 8 Fish Market, Melbourne

Auctioneer — CHAS. A. HILL

Phone — Cent. 8532

Fish sold on Account to Mr. J. W. Davies, Koitchuka, Vict.

For Week ending Friday, 193

Date	Number Boxes or Baskets Received	Class of Fish	£	s.	d.
Feb 16	2 Bags	1) 49 lbs Gds G. N. Cod (1 fish) 9	1	16	9
		24 " Cold " " 1/-	1	4	
		1) 10 " " " " (1 fish) 1/-		10	
		9½ " " " " (1 fish) 1/-		9	6
		54 " " Gold Perch (1 fish) 9	2	"	6

Top: Photo MR53. This catch of fish consisting of mainly Murray cod, a few Golden perch and a Silver perch was taken from Kow Swamp near Cohuna c1955. The larger lakes and swamps along the Central Murray once contained phenomenal quantities of native fish as evident from Peter Beveridge's writings for the Swan Hill area and F. J. Marett's account for Kow Swamp. Photo courtesy of Ron Mudford.

Bottom: Photo MR41. One notable fish from Kow Swamp was a Golden perch taken by professional fisherman William Davies in February 1938. It weighed 54 lb. (24.5 kg) after it was cleaned and represents the current record for the species. This receipt documents the sale of the fish at the Melbourne Fish Market. Photo courtesy of Henry Davies.

Photograph 15.10 Murray River Drought

Photo MR43. Severe drought has occurred in the Murray-Darling System regularly since European settlement. This photo is of the Murray River at Myall during the short but extreme drought of 1914. The owner of this image, Ian McDonald, was present as a two month old baby in the buggy on right. The fish were adapted to the boom bust cycle and could quickly recover when flooding occurred. Photo courtesy of Ian McDonald.

Photograph 15.11 Pental Island Cod

Photo EHS 9 of four Murray cod caught in the Little Murray River at Pental Island near Swan Hill in1926. Oliver Burton (left) and J. B. Rankin are in the photo. Of significance is the lack of trees lining the river with a similar scene recorded in 1862 in *Stereoscopic views of the River Murray* published by Edward Cole and George Burnell. The photos demonstrates that the Central Murray River was not uniformly lined with red gums and filled with snags but that parts of it, as described by Charles Sturt, Major Thomas Mitchell and Peter Beveridge, were surrounded by forests of tall reeds.

Original photograph from Joy Bickford, courtesy of the *Echuca Historical Society.*

Photograph 15.12 Trout Cod and Murray Cod near Swan Hill

Left & Centre: Photo MR46. Florence Jude and Peggy Jude with what is probably a Trout cod caught from the Murray River between Swan Hill and Nyah c1927. Enlargement of the fish (centre) reveals that it is likely that the top jaw would overhang in the closed position. The shape of the head, large eye and a hint of dashed markings suggests it is a Trout cod. Photo courtesy of Julie Whateley.

Right: Photo MR42. Henry & Joan Davies with a 98 lb. (44.6 kg) Murray cod captured near Euston in 1958. Henry was a fourth generation professional fisherman who resided at Swan Hill. His father, William Davies, caught the record Golden perch from Kow Swamp, supplied specimens of Trout cod to NSW State Fisheries and assisted John Lake. Photo courtesy of Henry Davies.

Photograph 15.13 A Big Catch Near Euston

Photo Museum Victoria mm002624.This catch, which includes Murray cod and Silver perch, was taken at Correna Bend near Euston in 1928. Photo reproduced with the permission of *Museum Victoria.*

15.3 The Changes

15.3.1 Changes to Native Fish Distribution and Abundance

15.3.2 Upper Lowland Zone

Newspaper accounts suggest that there was a reduction in fish stocks between Wodonga and Yarrawonga by the early twentieth century, with concern expressed about the effects of overfishing and pollution at Rutherglen and Corowa (*Argus,* 24 March 1896; *Sydney Morning Herald,* 18 December 1902). In 1928, a survey taken over thirty-six days near Wodonga, recorded the capture of 756 native fish including Murray cod, Trout cod, Macquarie perch, Golden perch and Silver perch (NSW Fisheries Report, 1928), indicating that substantial populations still existed at that time. Local reductions due to fishing pressure were acknowledged (NSW Fisheries Reports, 1920, 1921).

After the fish kills that occurred between 1929 and 1934 and which were caused by copper sulphate treatment of the Hume Weir, native fish were very rare near Wodonga (McFarlane, OH 53). By 1935 at Barnawartha, Golden perch and Catfish had completely disappeared, juvenile native fish were absent, and only a few cod were taken (*Argus*, 7 March 1935). In 1937, anglers between Albury and Corowa reported the catch rate of cod to have dramatically fallen to one a month (*Argus,* 3 July 1935). At Howlong there was a serious reduction in cod numbers by the mid 1930s, though small numbers of both Murray cod and Trout cod continued to be regularly captured, along with a few Silver perch. By that time Macquarie perch were rare, Golden perch very rare, and Catfish absent. All three types of perch had disappeared by the 1950s (Handorf, OH 61; Claude Handorf, pers. com.). Golden perch became extinct upstream of Yarrawonga Weir, with the last reported captures near Wodonga in 1938 and 1942 (Cadwallader, 1977; McFarlane, OH 53).

Downstream between Corowa and Yarrawonga, Macquarie perch were described as 'scarce' near the Ovens River junction in 1939 (*Argus,* 14 January 1939), though regular captures continued around that time (*Argus,* 26 February 1938). With the construction of the Yarrawonga Weir in 1939, native fish populations upstream became isolated, and by 1950 only the two cod species were found in any quantity above that point, with the river and lagoons being dominated by Redfin perch, Goldfish, trout and Tench (Cadwallader, 2007). Catfish had undergone a major decline in lagoons in the Yarrawonga area by the 1930s, with a relic population surviving in Ball's Lagoon until c1980 (Aitchison, OH 62). Fair numbers of both species of cod were present between Corowa and Brimin up till the 1950s, but the fishery declined after that time and Macquarie perch had completely disappeared by the 1970s (Cadwallader, 1977; Bill Ellis, pers. com.). Murray cod remained common near Brimin, though a decline was evident during the 1960s. Murray cod were present in very good numbers in Lake Mulwala, though smaller cod were scarce and occasional Trout cod were taken from the lake up till the early 1980s (Bill Ellis, pers. com.).

15.3.3 Middle Lowland Zone, Yarrawonga to Echuca

As early as 1892, an assessment of the fishery near Barmah concluded that it had been severely overfished resulting in a general reduction in fish populations (NSW Fisheries Report, 1892). By 1926, it was reported at Echuca that the typical angling catch rate in past decades of 40 to 50 lb. (18.1 to 22.7 kg) of fish in a few hours, had seriously declined (*Riverine Herald,* 7 January 1926). A 1937 newspaper account indicated that a decline was generally acknowledged in the cod fishery near Tocumwal, and this was associated with overfishing and introduced fish (*Sydney Morning Herald,* 24 September 1937). Returns from commercial fishermen suggest that there was increased catches of Murray cod between 1940 and 1951 in NSW (Rowland, 2005) which was also reflected in the Barmah Lakes fishery at that time (Laddie Clifford, pers. com.). Langtry concluded that by

1950 the Barmah fishery, while still productive, had severely declined compared with that in the past. Murray cod were very common between Yarrawonga and Barmah, though small cod were scarce, and Trout cod relatively common particularly towards Yarrawonga (Cadwallader, 1977). After 1950, anglers recall Trout cod to have undergone a serious decline so that by the end on the 1960s they had become generally rare. Murray cod, while still common, had undergone a further reduction in abundance. The only area that produced regular captures of Trout cod into the early 1970s was between Yarrawonga and Cobram, though by that time they were not considered to be particularly common (Claude Handorf, Bert Roberts & Bill Ellis, pers. com.). A 6kg fish was captured in a drum net in the Murray River downstream from Barmah in 1982 (Laddie Clifford, pers. com.), and was the last report from that area for nearly two decades. After floods during the mid-1970s, small Trout cod were regularly taken by anglers and became common downstream to Cobram (Author's pers. obs.).

Macquarie perch were common between Yarrawonga and Tocumwal until about 1950, then declined in abundance (Cadwallader, 1977; Handorf, OH 61; Vidler, OH 66; Nicholson, OH 67) At Barmah, a noticeable decline in catches commenced just after the Second World War (Briggs, OH 70; Laddie Clifford, pers. com.). Commercial fishermen returns recorded 1807 kg of Macquarie perch captured in NSW in 1965, the majority probably sourced from the Central Murray region, with a reduction down to 223 kg by 1973/74 (Harrison, 1977). While some of this catch may have included Silver perch, small numbers of Macquarie perch were taken near Barmah by commercial fishermen until the late 1970s, at least partially validating the commercial returns (Laddie Clifford, pers. com.). Macquarie perch were captured below Yarrawonga Weir by commercial fisherman Bill Ellis until the early 1980s (Bill Ellis, pers. com.). His catch on two occasions contained four and six Macquarie perch respectively in the length range 31 – 45 cm (Stuart Rowland, pers. com.). Occasional catches also occurred in irrigation channels near Berrigan in the late 1970s (Alf Wessel, pers. com.), but by the end of the 1980s Macquarie perch had vanished from the middle Central Murray.

As early as 1930, there was a reported reduction in the abundance of Golden perch upstream of Barmah (NSW Fisheries Report, 1930). The recollections of commercial fishermen suggest that Golden perch underwent a slow general decline between Yarrawonga and Echuca after the Second World War (Laddie Clifford & Bill Ellis, pers. com.). Very good catches were taken at times (Cadwallader, 1977; Photo MR38), but less frequently than in the past and were usually associated with flood events (Reynolds, OH 69; Lever, OH 77; Bill Lever, pers. com.). By the late 1970s they were scarce in the Cobram area (Claude Handorf & Bert Roberts, pers. com.; Author's pers. obs.). During the 1960s, near Cobram, there was a noticeable decline in Silver perch (Handorf, OH 61), though they remained common near Barmah, with large catches taken at times (Clifford, OH 72; Laddie Clifford, pers. com.). Catfish were common in the middle Central Murray River in the 1920s, but by the 1930s became rare in the river. They were still found, however, in the Barmah Lakes and lagoons (Laddie Clifford, pers. com.). They disappeared from lagoons and the Cobrawonga Creek near Cobram during the 1940s (Roberts, OH 63) and became scarce at Barmah around the same time. By 1950 the fish had virtually disappeared (Cadwallader, 1977; Briggs, OH 70; Norris, OH 71). Blackfish disappeared in this section of the Murray River by the 1940s with rare captures taking place after that time (Clifford, OH 72; Laddie Clifford, pers. com.).

15.3.4 Middle Lowland Zone, Echuca to Wakool Junction

In the Gunbower area Trout cod had disappeared by the early 1960s, though Murray cod remained common (Wilson, OH 73; Daws, OH 99; Garry Daws, pers. com.). At Murrabit, a decline in the cod fishery took place around the Second World War, and Trout cod had become rare by that time, with few subsequent captures (McDonald, OH 74). In 1950, Langtry described Murray Cod as being 'not in short supply' near Swan Hill, though did not consider them to be as abundant as further downstream (Cadwallader, 1977). Fish up to 100

lb. (45.4 kg) were regularly captured (Roughley, 1951). Trout cod were common at Pental Island during the 1950s, but by the 1960s they had virtually disappeared, with only occasional captures into the 1970s (Davies, OH 75; Henry Davies, pers. com.).

Roughley (1955) reported Macquarie perch to have become 'greatly depleted' by the 1950s, though he stated that there was a small increase in captures around that time between Torrumbarry and Swan Hill. Langtry also considered them to be rare below Echuca by 1950 (Cadwallader, 1977), and they are not recorded in the oral history. At Swan Hill Macquarie perch were scarce by the 1950s, though they were regularly captured at Pental Island and Wood Wood. They had completely disappeared by the 1970s (Davies, OH 75; Henry Davies, pers. com.). By the early 1970s a serious decline had occurred in the catches of Golden perch in the Murray River near Cohuna, and Bony Herring had disappeared from the Gunbower Creek (Wilson, OH 73). Silver perch were 'fairly abundant' in the Murray River below Torrumbarry c1950 (Roughley, 1955; Cadwallader, 1977), and large catches were taken up to the late 1970s. After that time a decline was evident (Author's, pers. obs.). Similarly, near Murrabit they were abundant in the 1950s, but during the 1960s a major decline occurred (McDonald, OH 74).

Roughley, in 1946 made a general comment that in the Murrumbidgee and Murray Rivers Catfish were 'almost extinct' (*Canberra Times,* 26 June 1946). In 1955, he stated that 'in most parts of the Murray River it is now rare where at one time it used to swarm' (Roughley, 1955). Langtry reported Catfish to be absent at Swan Hill around 1950, though he indicated captures occurred between Torrumbarry and Barham (Cadwallader, 1977). By the 1970s, Catfish had disappeared from Murray River near Cohuna and from Kow Swamp (Wilson, OH 73). Catfish and Blackfish become scarce near Murrabit by the 1930s, with these declines being linked to the proliferation of Redfin perch (McDonald, OH 74).

15.3.5 Lower Lowland Zone

While acknowledging that some reduction in the fishery had occurred, Langtry in 1950 reported that excellent fishing for Murray cod existed between Euston and Mildura, along with Golden perch and Silver perch, but that Trout cod were 'exceedingly rare' (Cadwallader, 1977). He noted the presence of large numbers of small Catfish in irrigation channels near Mildura, stating that they were 're-establishing themselves', implying that they had previously undergone a decline. Upstream of Mildura at Boundary Bend, Catfish were scarce by 1949 (Cadwallader, 1977). At Merbein in 1857, Blandowski had reported the presence of Blackfish in lagoons, and newspaper accounts record their presence during the 1920s (*Argus*, 2 February 1922, 7 July 1925). Langtry reported Blackfish to be absent in the lower Central Murray by 1949 (Cadwallader, 1977). By the 1960s at Wentworth, small Murray cod were scarce and Trout cod were completely absent and had been so for many years (Lever, OH 77).

15.3.6 Changes to Habitat

From the 1860s, there are accounts reporting the overfishing of native fish in the Central Murray River. In 1869 at Barmah, the catch of fish, principally cod, averaged 3 tonnes per week (*Illustrated Australian News*, 23 March 1869), and at times illegal nets completely blocked all fish passage upstream (*Echuca and Moama Border Post*, 4 January 1893). Commercial catches of fish of up to two tonnes per day were recorded from Echuca (*Argus,* 17 November 1868), with a total of 147 tonnes being dispatched from Moama in 1883 (Rowland, 2005). On one occasion, 18 tonnes of fish were delivered to the rail head at Swan Hill by paddle steamers (*Argus,* 17 August 1895) and as late as 1924, 6 tonnes a week was regularly dispatched from that town (*Argus,* 29 September 1924). Until the introduction of the closed season, large numbers of fish were

caught at spawning time. At Corowa in 1875, one angler expressed concern for the future of the fishery due to large numbers of fish with roe being taken (*Sydney Morning Herald,* 8 November 1875). Even after the introduction of closed waters and the closed season, illegal take of native fish continued (NSW Fisheries Report, 1908; *Sydney Morning Herald,* 19 December 1903, 17 November 1905, 8 December 1921).

In 1915, by which time the fishery was already reported to be in decline, takings from the Barmah region was recorded as being 193 tonnes of fish, from Tocumwal 20 tonnes, Picola 31 tonnes, Koondrook 124 tonnes, Swan Hill 714 tonnes and Mildura 913 tonnes (NSW Fisheries Report, 1915). As late as the 1930s, individual daily shipments out of Mildura - as large as four tonnes a day - were reported (*Argus,* 3 February 1938). By the 1930s, the commercial catch was in serious decline (Rowland, 1989). Many other fish, possibly the majority, went unreported, having been transported from smaller centres, sold locally, taken by recreational anglers, or captured by illegal operators. Explosives were used widely to catch fish (*Argus,* 8 February 1930). When the Yarrawonga Weir was drained for maintenance in 1949, up to 1000 lb. (454 kg) of cod per week was taken (Cadwallader, 1977). The use of illegal drum nets was also linked to the loss of platypus in parts of the river (*Sydney Morning Herald,* 28 July 1947). The commercial fishery in NSW was closed in 2001 (Rowland, 2005).

In 1853, the paddle steamers *Lady Augusta* and the *Mary Ann* travelled up the Murray River from South Australia, the former reaching Maiden's Point (Echuca). They ushered in the era of river boat traffic with Wahgunyah, Echuca, Swan Hill, Robinvale and Wentworth being established as major ports on the Central Murray. A Royal Commission in 1867 recorded that downstream of Mildura, passage was possible in most seasons throughout the year, but that upstream the Murray progressively becoming shallower. Above Echuca, the traffic ceased in most years for several months due to low river levels. Snags proved to be a hazard to the traffic, and wherever the paddle steamers travelled extensive desnagging of the waterway took place. Government records indicate that it was the upper reaches of the Central Murray where the river was narrow and flowed through dense red gum forests, particularly in the Gunbower and Barmah areas, that experienced the most extensive snag removal. Other areas where red gums were largely absent, such as near Pental Island and the Swan Hill Flats, had fewer snags and did not require extensive desnagging (Victorian Government, 1867).

Between 1864 and 1869 the Murray between Albury and Echuca, including the Barmah Lakes, was desnagged. In a typical year like 1865, over 3,000 large snags were removed. In some stretches all of the submerged timber was removed, as well as many bankside trees in danger of falling into the river. Immediate changes in the structure of the river bed were observed (Public Works Department Victoria, 1865, 1867; Victorian Government, 1867; *Argus,* 18 February 1869; *Riverine Herald,* 19 June 1869). During 1865, over 600 snags were removed from the Coghills Bends area between Swan Hill and Robinvale, and 3000 were removed by 1869 from Campbells Island downstream of Barham (Public Works Department Victoria, 1865, 1867; *Riverine Herald,* 19 June 1869). The Murray River was cleared of the worst of the snags by 1880. The snagging boats continued to operate, however, as snags were considered to exacerbate flooding by restricting flow. The last dedicated snag boat, the *Melbourne,* operated on the Central Murray until 1924 (Mudie, 1961).

Further desnagging of the upper Central Murray River was carried out to facilitate delivery of the extra water available with the enlargement of the Hume Dam, and the construction of Dartmouth Dam on the Mitta Mitta River. Records of the Murray-Darling Basin Commission indicate that between 1976 and 1987, 24,500 snags were removed between Albury and Howlong (Gippel *et al.,* 1992). Snags play a key role in the ecology of rivers, and recent studies have suggested a strong association of Trout cod in lowland rivers with woody debris in areas of flowing water. Desnagging has been suggested as playing an important role in their disappearance (Brown *et al.,* 1999).

The Great Flood of 1870 caused enormous damage to settlements along the Murray (*Argus,* 19 September 1870), the immediate response being to construct levee banks and plug the gaps in natural levees to prevent future flood events. By 1898, extensive work between Echuca and Swan Hill blocked flood water on the Victorian side of the river. Similar work had also taken place further upstream in the Tocumwal area (minutes of the Barham Progress Association, August 1898). The levees eliminated much of the wetlands and billabongs, described by early observers such as Peter Beveridge as once containing an abundance of fish, and reduced the frequency of replenishment of many others both in terms of water and fish. As the river became increasingly regulated and levee banks were constructed on the floodplain, many of the billabongs themselves disappeared, becoming permanently dry. Some billabongs were levelled or ploughed to provide additional agricultural land. By 1950, over a third of the former extensive wetlands along the Central Murray River had been lost (Cadwallader, 1977).

In 1887, George and William Chaffee initiated large scale irrigation in the Mildura region. A meeting convened in May 1902 between the then Prime Minister of Australia, Edmund Barton, and the Premiers of New South Wales, Victoria and South Australia, recommended action for the storage of water for irrigation and the improved navigation of the river. This led to the River Murray Agreement being ratified by the Commonwealth and the State Parliaments in 1915. Irrigation along the Murray expanded, resulting in the construction of diversionary weirs and locks, commencing with the Torrumbarry Weir in 1919. This was followed by the Euston Weir and Lock 11, the latter converting nearly a hundred kilometres of riverine environment into a lake. In 1917, construction commenced on the Hume Weir and was completed in 1936. The weir had sufficient capacity to provide some flood mitigation, as well as storing water for summer irrigation and partially regulating the flow of the river. Yarrawonga Weir was constructed downstream in 1939 to divert the releases from Hume into an extensive channel system (Eaton, 1945).

The weirs provided significant obstacles to fish movement, and only the Euston Weir incorporated a fish ladder. The loss of Golden perch populations in the upper Central Murray and Ovens Rivers was later attributed to the construction of the Yarrawonga Weir (Lake, 1959; Cadwallader, 1977). Aboriginal people at Barmah believed that the weir also impeded migrations of Trout cod and Macquarie perch (Briggs, OH 70). Enlargement of the Hume Dam in 1961, combined with diversions from the Snowy Mountains Scheme and later Lake Dartmouth on the Mitta Mitta River, resulted in increased regulation of the flow of the Central Murray River (Thompson, 1994) and significant thermal pollution of the water downstream Albury (Ryan *et al.,* 2001).

From an early date there are accounts of fish kills in the Central Murray attributed to natural phenomenon such as droughts, 'black water' flooding events, and bushfires. In July 1865 it was reported that after rain near Euston 'the lagoons, lakes and creeks that are not running are literally teeming with dead fish. 'Great and small, all seem to have shared the common fate' (*Sydney Morning Herald*, 24 July 1865). Later that year basin wide kills were reported and attributed to an 'epidemic' killing the fish (*Deniliquin Pastoral Times*, 9 September 1865). In the following decades kills linked to the activities of humans were documented. A Rutherglen angler reported that at times cod were killed in the river and adjacent creeks by wool washing and 'boiling down' activities (*Argus,* 24 March 1896). At Mildura large numbers of juvenile cod, Golden and Silver perch, and Catfish were regularly killed by stranding during irrigation pumping (*Argus,* 8 September 1922). Water diversions in the Gulf Creek at Barmah stranded large numbers of Macquarie perch and Catfish (Cadwallader, 1977). Very large kills of Catfish occurred in the Central Murray River during the mid-1920s. These were investigated by the Victorian Fisheries and Game Department who concluded that a disease 'epidemic' was responsible (*Argus,* 20 November 1929). Large numbers of cod died in the Gunbower Creek during the early 1950s (Wilson, OH 73) with ash from fires affecting fish and crustaceans in the Cohuna area around 2003 (Wilson, OH 73).

Due to concern over algae levels tainting the water in the Hume Weir during its initial filling, the water was treated with 'bluestone' (copper sulphate) commencing on the 14th of January 1929. Additional doses were applied at varying times between the months of November and March up till 1934 (Cadwallader, 1977; *Sydney Morning Herald,* 29 November 1933, 10 February 1934). In late 1929, it was found that the initial copper sulphate treatment caused extensive corrosion of the steel sluice gates of the Hume Weir necessitating their repair. Draining of the weir commenced and was completed by April 1930 (*Sydney Morning Herald,* 2 April 1930). Water released from the weir caused enormous fish kills in the Albury area, with contractors hired to remove the rotting fish (McFarlane, OH 53). Coinciding with the draining of the weir in November 1929 it was reported that an 'epidemic' was sweeping down the river killing large numbers of Murray cod at Albury, Mildura and into South Australia (*Argus,* 20 November 1929; *Adelaide Advertiser,* 5 December 1929). The extent of the kill prompted a comment that the cod fishing had been ruined (*Sydney Morning Herald,* 28 November 1929, 30 November 1929; NSW Fisheries Report, 1929).

At Torrumbarry large numbers of dead cod were seen, crayfish crawled out of the river, and mussels and shrimps were affected. At one bend near Gunbower, 500 dead fish were counted (*Argus,* 28 January 1930, 30 January 1930), while near Perricoota thousands of dead 'cod and bream were packed-tightly along the river banks' (*Barrier Miner,* 30 January 1930). Further downstream, in July 1930 extensive cod kills were reported in South Australia (*Adelaide Advertiser,* 30 July 1930). There were reports of fish littering the banks of the river near many towns with fish in the river behaving strangely as though they were 'doped' (*Argus,* 8 February 1930). Ongoing kills continued in the weir and downstream, up to the cessation of the treatment in 1934. The worst years were 1929-30 (*Sydney Morning Herald,* 17 January 1933; Jack Rhodes, pers. com.). It was suggested that the water from Lake Hume had decimated the crayfish population (*Argus,* 1 May 1936). The treatment was also linked to the death of large numbers of waterfowl (*Sydney Morning Herald,* 19 December 1932).

Sturt (1833) described the Murray at the Murrumbidgee junction as clear, but the activities of Europeans led to a decline in water quality. In 1907, it was reported that sludge from mines on the Kiewa River had caused extensive discoloration of the Murray, as well as affecting the fishery between Albury and Corowa (NSW Fisheries Report, 1907; *Argus,* 28 October 1907). Mine workings in the Ovens catchment resulted in large volumes of silt entering the Murray River near Yarrawonga, so that by 1907 holes that had been 12 feet deep had been reduced to as little as three feet from the silt. The discharge from the mines discoloured the Murray River down to Echuca (*Adelaide Advertiser,* 2 May 1907). It was reported in 1937 that clearing of vegetation had resulted in sections of the river being muddy 11 months of the year (*Argus,* 24 August 1937). In 1951, Langtry recorded the changes that had occurred to the Murray in the Barmah area. His writings are supported by the stories from senior residents recalling the 1920s to 1950:

> The situation before the advent of the Hume Weir / Although discoloured at flood time, the water was extremely clear, and the bottom could be seen at 6 to 8 feet / There were many large, deep holes throughout the river and the great difference between summer and winter levels allowed the clay banks to harden. / (The) transparency is such that it is difficult to see the end of a 12 – inch paddle. / the banks of the Murray have steepened and become concave in many cases. / It is suggested that it is the lessening of the extreme levels between summer and winter that has caused the softening of the banks around the trees, and thus aided erosion. In this stretch of river deep holes have disappeared (Cadwallader, 1977).

Since European settlement a number of exotic fish species have established a permanent presence in the Murray River, mostly through deliberate introduction directly into the water way or its tributaries. Goldfish were reported in the Barmah area in 1873 (*Castlemaine Mail*, 26 April 1873) and moved both upstream and

downstream, reaching the lower Murray during the 1890s (*Adelaide Register*, 18 May 1907) and Albury c1900 (McFarlane, OH 53). By the 1930s they were present in huge numbers in the Central Murray, accumulating below weirs such as those in the Gunbower Forest (Marett, 1943). The species was recalled as being common along the length of the Central Murray, as well as in the adjacent creeks and lagoons during the lifetimes of all persons interviewed during the author's research. English Tench were introduced to the Campaspe River in the nineteenth century (Clements, 1988) and were present in the Murray River near Swan Hill by 1924 (*Argus,* 18 July 1924). They were reported as becoming common in lagoons near Mildura in 1928 (*Argus,* 13 November 1928), and had reached Wodonga in 1940 (McFarlane, OH 53). Langtry reported Tench to be widespread and common by 1950, particularly in lakes and lagoons, and considered Goldfish and Tench to have displaced native fish in these habitats (Cadwallader, 1977). English Roach were reported near Swan Hill in 1905 (*Argus,* 22 December 1905) and near Albury in 1923 (*Argus,* 23 January 1923) but did not develop significant populations.

Redfin perch were introduced by acclimatisation societies during the late 1870s into the Campaspe and Loddon Rivers (Clements, 1988), both of which discharge into Central Murray River. The Victorian State Water Supply Department introduced them into irrigation channels near Mildura to control crayfish in the 1890s (*Argus,* 22 February 1893). Redfin perch were reported to be common in the Murray and nearby creeks in the Gunbower area by 1911 (*Argus,* 17 February 1914), and were becoming common in lagoons near Mulwala at the same time (*Argus,* 26 June 1914). They reached Wodonga in 1912 (McFarlane, OH 53) and had become abundant at Albury, Corowa and Swan Hill by 1921 (NSW Fisheries Report, 1921; *Argus,* 22 December 1922). Newspaper accounts suggested that the arrival of large numbers of Redfin perch was associated with a significant decline in the native fishery and they were considered to be a major pest (NSW Fisheries Report, 1921; *Argus,* 22 December 1922, 3 July 1935, 8 November 1935). Langtry believed Redfin perch in the Central Murray to be a serious problem, reporting that in 1949 both the river and billabongs above Torrumbarry contained large numbers, but that downstream they were mostly confined to the billabongs and channels. He suggested that recent declines of Catfish had taken place in lakes and lagoons subsequent to the arrival of Redfin perch (Cadwallader, 1977).

Trout were introduced to the Murray-Darling Basin in 1872, with stockings becoming widespread in Victoria in the 1880s, and in New South Wales in the following decade (Clements, 1988). Brown and Rainbow trout became very common in the Murray River immediately downstream of Lake Hume. They were regularly captured down to the Yarrawonga area, and at times caught along the entire length of the river (Cadwallader, 1977; *Riverine Herald,* 30 August 1892; Davies, OH 75). Langtry considered Brown trout and Redfin perch to have displaced native fish between Albury and Corowa (Cadwallader, 1977). European carp may have had a minor presence in the Central Murray from the late nineteenth century, after the species was introduced to the Murrumbidgee catchment in 1907, and perhaps as early as 1875 (Stead, 1929a; *Yass Courier,* 24 December 1875). After the release of a different strain into Lake Hawthorne near Mildura around 1964, and their escape into the Murray River in 1968, carp proliferated and spread along the river, reaching plague proportions during the 1970s. European carp have been suggested as modifying aquatic habitats and are implicated in the declines of some native fish species in a number of areas (Koehn *et al.,* 2000). Since 1984, the Oriental weatherloach has appeared in the Central Murray probably inadvertently introduced through the disposal of unwanted aquarium pets (Lintermans, 2007).

15.4 The Current Situation

The *Sustainable Rivers Audit* concluded that the:

> Central Murray Valley fish community was in Poor Condition. The intrusion of alien species was moderate compared to some other Valleys, and native fish were relatively abundant, but only 40% of predicted native species were found. Substantial species richness had been lost (Davies *et al.,* 2008).

While the Central Murray is considered by many anglers to be a good fishery, particularly for Murray cod, the *Sustainable Rivers Audit* reported that three large native fish species had not been detected during recent surveys. These fish are River blackfish, Catfish and Macquarie perch. Blackfish are occasionally caught by anglers, particularly upstream of Echuca, though are rare. Catfish have a presence in the lower reaches near Mildura and in the Gunbower area, but along most of the Central Murray are very rare. There have been a handful of reports by anglers of captures of Macquarie perch in the Central Murray since the 1980s, but the species is effectively extinct in this catchment. Golden perch remain widespread in the Central Murray, though appear to be less abundant upstream of Echuca. Silver perch are universally reported to have been common below Torrumbarry Weir up to the late 1960s. Subsequently they became scarce, and are now a prohibited take by angling. Recent reports indicate that they may be undergoing a significant recovery, particularly downstream of Torrumbarry. Most native species are scarce upstream of Lake Mulwala with the exception of Murray cod which have a modest presence.

With the disappearance of Trout cod populations in the Murrumbidgee and Ovens catchments by the 1980s, the Murray River between Yarrawonga and Cobram contained the last remaining wild population of the species. During the mid-1970s, the Trout cod population started to recover, becoming very common down to Tocumwal by the early 1980s, and Barmah by the late 1990s. Trout cod are now abundant down to Barmah with anglers recently confirming captures near Torrumbarry, Murrabit and Swan Hill.

The Central Murray River in the Barmah area has been the focus of research on the biology of native fish with investigations into floodplain inundation and larval fish recruitment to develop protocols for environmental flows. In 2001, the Murray-Darling Basin Commission initiated the *Sea to Hume Dam Fishway Program* with the goal of restoring continuity of fish passage upstream over man-made barriers - including locks and weirs - from the Hume Dam downstream to the Murray River mouth. As part of the Murray-Darling Basin Authority's *Living Murray Initiative* hundreds of snags consisting of large red gums salvaged from road works have been placed in the Murray River between Albury and Yarrawonga.

15.5 Newspaper Highlights

Argus, 2 November 1860.
Contemplated Fishing Company. – We learn that it is in contemplation to form a joint stock company for the purpose of supplying the Wahgunyah diggings, and we presume other localities, with fish from the River Murray. We hope the project will succeed, and that it will be speedily carried into effect. At present there is on these diggings but a scanty supply of fish, notwithstanding that the Murray is close to us, and the river is literally alive with codfish, bream, perch, and a small fish much like a schnapper. Mr. Coombs, an enterprising man, has made a start in the matter, and as fast as he can, single-handed is supplying these diggings with fish. He brings them in every Thursday evening, and, as may be supposed, there is a rush for them, particularly the small fish, bream, perch, and schnapper, weighing from 1lb. to 41b.

Riverine Herald, 17 February 1864
Exploitation of Murray Fish. The Murray Fishing Company has just completed an order of the Melbourne Acclimatization Society, for one hundred and fifty young codfish and fifty golden perch, for shipment to England by the Lincolnshire. / They averaged from 1 ¼ to 3 ½ inches in length

Riverine Herald, 23 March 1864
The Company has made an offer to the Municipal Council of Sandhurst to stock one of their public reservoirs with river fish. After the next month it will be impossible, we are told, to supply any orders until next season. On Thursday three loads of fish will be taken to Sandhurst, to meet the increased demands of the market on Good Friday.

Riverine Herald, 30 March 1864
We mentioned in our last the failure of the Murray Fish Company to convey a consignment of live fish to Melbourne for the Acclimatization Society, for transmission to Tasmania. Last week, however, another attempt was made, which proved perfectly successful, the fish having arrived in capital condition in Melbourne on Saturday.

Argus, 7 May 1866
A short time since a bullock driver belonging to one of the snagging parties a short distance above Tocumwal was swimming across the Murray at night when his foot was seized by a large codfish, which nearly pulled him under water and from which he had much difficulty in extricating himself. His foot was badly scratched by the teeth of the fish.

Sydney Morning Herald, 14 November 1868
Fish in the Murray A Melbourne journal states that the following is given as a list of the fish which is to be found in the Murray:- Herring, silvery white, shape of dace; cockerling, like bream in body, with head like cod – this fish sometimes reaches eleven or twelve pounds in weight; jew-fish, catfish, or eelfish found mostly in lagoons and branches; black-fish; turtle; Murray cod, three species, different shapes; bream, two varieties, gold and silver; lampreys, scarce; lobsters; prawns.

Riverine Herald, 9 March 1870
We are informed that five hundred Murray cod and trout were forwarded by Mr Pascoe to Avoca on Monday. Mr Lewen went down as far as Castlemaine in the train in charge of the fish, and report that they all arrived alive and in excellent order. They were taken on to Avoca in a conveyance, and, we are told, were placed in the water in a most satisfactory condition yesterday. The fish were supplied by the Murray River Fishing Company.

Echuca and Moama Border Post, 4 January 1893

. . . we heard that all the outlets and water races of Lake Moira were blocked by nets, traps and boxes of the Victoria fishermen, so much so that the most expert of Isaac Walton's of Echuca and Moama found it almost impossible to hook a fish from Barmah to below Echuca! Let us say at the outset that we found common report fully proved, and that something should be immediately done by the Governments of Victoria and New South Wales to legislate in such a practical manner as to prevent the wholesale destruction of Murray River fish, i.e., cod, bream, cockerill, silver and golden perch, classes of freshwater fish, which for quality and commercial value are unequalled in the colonies. / At break of day Mr. Manton and the party started again, and at the upper end of the little river behind tree 264 we came across one of the largest bag nets ever seen on the river. Mr. Manton seized the net, which upon being examined contained large quantities of cod, perch, and cockerill fish. Upon the left bank of the creek there were two deep fish boxes full of heavy fish, old and young, large and small, containing about 4 cwt. of grand fish. So completely did the net block the passage of the fish that it was impossible for any to pass.

Argus, 3 March 1911

"Murray Trout". "Nearly all the anglers I have met here," writes Mr. R. W. Harvey (Kerang), "as well as those in the Mildura District, declare that there is a fish in the northern rivers which they call 'Murray trout.' They describe it as resembling the Murray cod, but the markings are different. The fish is a finer shape, and, without doubt, a garner sporting fish.

Argus, 17 February 1914

English Perch In The Murray. Referring to a late note on the subject, an old bushman and valued contributor, Mr. H. W. Ford, says: - "In 1911 there were thousands of these fish in the Murray River. The finest English perch I ever saw - 4lb. weight – was caught in a drum net while I was camped on the river bank. Just below the weir on Gunbower Channel hundreds of small English perch could be seen at favourable times. I have speared some of these myself for bait for cod-fishing."

Argus, 26 June 1914

Perch in the Murray. "H.B." (Mulwala), commenting on a note last week with reference to English fishes in the Murray, says that quite lately some of his grandchildren were fishing in a lagoon in the locality, and the little girl brought home a very fine English perch. Up to that moment he had no idea that these fishes were either in the lagoons or the river, but he has since made inquiries, and found that English perch have been frequently caught.

Argus, 15 October 1920

Mr. Pennycook adds that all the lakes and streams in the Kerang and Swan Hill districts are infested with cormorants / One of his fishing friends told him that he recently saw a big black cormorant struggling with a 3lb. Murray trout.

Argus, 2 February 1922

Mildura and District. Merbein:- Mr. G. Hodson caught a 9in. blackfish in the Murray at Merbein. It has been contended that there are no blackfish in the Murray in the vicinity of Merbein.

Argus, 18 July 1924
Murray Perch. On the subject of Murray perch, and more particularly golden perch, "177" (Swan Hill) reminds me that he had a note on the subject about three years ago. In the Murray Downs lake, which is just across the river from Swan Hill, Mr. C. Picken once got a golden perch of 16½lb. and Mr. T. King got one weighing 14lb. 14oz. These are two largest of which the writer has heard, although Mr. Picken saw a fish dead in a tank which he thought might have been heavier than either of them. The lake bed is still under water, and there is an abundance of feed for the perch.

On the Merran Creek, where he lived for some years, "177" says it was quite an ordinary thing to get golden perch up to 8lb. and 10lb. Mr. Picken once got a Macquarie perch weighing 18lb. / Mr. Frank Singleton, of Swan Hill, confirms the statement elsewhere as to the weight of the golden perch caught by Mr. Charles Picken, while a friend of his got one 15lb. The Merran River, more than once mentioned lately, seems to be famous for its big fish. The catfish there run up to 14lb., and Mr. Singleton mentions that in using a bait net last year he and Mr. Wilson got one of 8lb. in the Murray, also a tench of about 5lb.

Argus, 30 January 1925
Blackfish In The Murray. Mr. Frank W. Singleton says that fishing in the Murray, above Swan Hill, Mr. Bob Wilson and he caught a blackfish, and a few days ago, when collecting bait with a net, they got two small rainbow trout. Both fish are, in their experience, unusual in that part of the Murray.

Argus, 7 July 1925
Small Murray Fish. Some little time ago I published a note from W. G. Bennet (Merbein) about great numbers of small fishes which he and others of a fishing party had noted in the waterhole. As I expressed a wish for further information it is now supplied. The fish described were taken from a small waterhole near the Murray, and about 18 miles from Merbein, on May 2. They included Murray cod, Macquarie perch, bony bream, catfish, and carp, from 1in. to 2in. in length; blackfish from 1in. to 1½ in.; English perch, from 2in. to 3in.; and native trout about 4in. long. The hole was between the Murray and a large billabong. The river had been high for some time up to March, so that it would overflow into the billabong, and, when the waters receded, left these holes full of small fish. A Yearly Occurrence. The writer of the note explains that at Cowana Bend, about two miles from his house, the same thing occurs almost every year, and millions of young fish perish.

Argus, 13 November 1928
Murray Tench. / "I have just had a letter from a fisherman who fishes just this side of Mildura. He tells me that tench are increasing very fast in these waters, and in another five years will have complete control of the lakes there.

Argus, 13 January 1930
Dead Fish In Lake. Hot Weather Thought to be Cause. Mildura, Sunday.- Hundreds of dead fish are floating on the surface of Lake Mournpoll, near Hattah. The fish comprise Murray cod, perch, bream, and catfish. Some of the cod were estimated to weigh at least 60lb. The lake is about 40 acres in extent, and the water 18in. deep. It is considered that the water became over-heated during the recent hot weather.

Argus, 28 January 1930
Pollution Causes Mortality. Bendigo, Monday, – Anglers who returned to Bendigo today from fishing trips on the Murray River in the Gunbower district stated that the river is strewn with dead fish. At a bend in the river more than 500 fish, weighing up to 45lb., were washed upon the banks. It was believed that the mortality was due to some pollution of the stream on its higher reaches.

Argus, 18 December 1931
Macquarie Perch. It was a surprise to find that a strange fish caught at Koondrook was one of the best known perches of the Murray – or to be more exact, its tributaries. Mr. E. S. Peck sent one of the fish which I passed on unseen to the National Museum, where they recognised it as Macquarie perch, a very good angler's and table fish, though in the last recommendation not quite comparable with the golden perch.

Argus, 7 March 1935
Referring to a recent paragraph in Notes for Boys Mr. H. Pooley (Barnawartha) says that no one along his part of the Murray – say for 100 mile – has been so unsporting during the last five or so seasons to keep undersized fish. Indeed no juvenile native fish of any kind have been caught during this time. An occasional large cod has been landed and a few medium sized ones but anything under 3lb. is a rarity. Even the catfish has disappeared and that fine sporting fish the golden perch is now merely a memory.

Argus, 16 May 1935
General Topics. A Twice-caught Fish. A good fishing yarn, which should interest both men and boys, is told by Mr. Albert Dettmann, of Woomelang. He relates that when fishing on the Murray near Narrung he tried to release a companion's line from a snag, but the line broke off and the fish got away. Next morning he found one of his own lines snagged, and with a fish on it. / The fish was a Murray trout weighing 3lb.

15.6 Significant Extracts from the Annual Reports on the Fisheries of NSW

1907
Information was received from the Corowa Anglers' Club, that the waters of the Murray River were being polluted to such an extent by mining operations on the Mitta Mitta and Kiewa Rivers—tributaries of the Murray flowing through Victoria—as to cause the destruction of fish-life, and representations were made to the Victorian Government by the Premier of this State with a view to having the nuisance abated.

1921
Great numbers of English perch and carp were netted in shallow waters near Corowa and Albury, while indigenous fishes were in negligible quantities. The voracious English perch is rapidly increasing in numbers in the Murray River and adjacent creeks, &c., and becoming a serious menace to the fishery.

1929
Fish Mortality and Pollution of Waters at Hume Weir, due to sudden submersion of lands hitherto untouched by floods, and release of silt from lagoons within this submerged area, is believed to have been the cause of considerable mortality among indigenous fishes in Hume Reservoir which occurred during November. Exhaustive inquiries and investigations at twenty-eight centres along Murray River showed that no serious mortality occurred between Hume Weir and Wentworth; dead fish were seen floating past Cal Lal in considerable numbers, but no information could be obtained as to whence they came; it is considered that the cause of death was merely local and confined to a small area. / Murray River was very seriously polluted due to Hume Weir storage, but fish were not affected thereby. Some mortality occurred due to muddy effluent after storms. / Many fish, estimated at 2,000 lb. aggregate weight, were destroyed presumably by explosives in Hawkesview lagoon. Among the dead fish were Murray Cod up to 40 lb. individual weight.

1930

Inspector's Report- / The quantity of fish consumed in Albury was between 300 and 400 lb. per week. No locally captured fish was consigned to markets / Murray cod and perch were generally plentiful; English perch were very numerous in Murray River. / During the year Hume Reservoir became seriously polluted by algae, but this did no harm to the fish. Owing to the financial position but few patrols were made: unlawful fishing was very prevalent. Several muddy freshets occurred, but without injury to the fishery and enabled fish to move upstream. Fisheries conditions at the end of the year were satisfactory. No diseases or pests were observed. Some very large Murray cod were caught by anglers – largest reported weighed 75 lb. English perch have become very numerous - more so than for some year; anglers report capture of as many as 200 in a few hours, up to 4 and 5 lb. weight. No golden perch are known to have been taken above Tocumwal for a number of years – these fish do not appear to travel above Moira Lakes. Since water has backed up by Hume Weir, cormorants have collected in great numbers, and new rookeries have been observed. These birds appear to destroy large numbers of the outlawed English perch.

15.7 Central Murray River Catchment Oral Histories

The following oral histories (OH 61-77) mostly discuss the Central Murray Catchment.

OH 61

Claude Handorf of Burrumbuttock was interviewed in March 2008 at an age of 70 years.

I'll be seventy on the 19th of April, I've been all my life in Burrumbuttock, me dad was born in this area. They used to go out to the Billabong Creek fishing; they used to get the cod and the Blackfish or greasies. As a kid I went out there that was about eight to ten mile above the Walbundrie Weir, between there and Walla, my uncle lived out there. We often used to go out there and it was no problem to catch eight or ten Blackfish, ten, twelve up to fourteen inches long. Me uncle and me dad, they used to get small cod out there, it was no trouble to get cod there for tea, but that was before my time. They also used to get out there what they called the silver eyes or white eyes, in the same area, there used to be quite a few about, but that would have been in the 1920s. They were a beautiful eating fish, many years later they, the Macquarie perch, exploded in Dartmouth, they had a beautiful flesh. Now there's a bag limit of one on them up there so it's not worth going up there for them.

My dad used to fish the Murray a lot at the old creamery reserve, just above Howlong. I can remember as a kid I went out there with him, they used to set these lines with big cow bells, each one was different, so they'd know when they had a fish. I remember me dad mentioning they put the bluestone in the weir years ago to clear the water, and how it virtually wiped out everything in the river. He was with me when I spun a seventy pounder on a floppy. He never spoke about big fish, five, seven pound seemed to be the common size, up to twenty or twenty five pound was one of his biggest fish. I've got a photo of him, it would be in the 1930s, with some cod from there in front of the truck and none of them are big fish. I can remember him talking about a rock cod; he did mention there was two types of cod.

We also caught the silver eyes in the Murray down near Howlong, but the grunter were more common. Really we very seldom would get the white eyes and the last ones would have been in the early fifties. In the latter years there was a lot of redfin, we used to get a lot. And yellowbelly, we used to only get the occasional one, they were rare. Dad never mentioned catching Catfish out of the Murray. We used to go out to Urana, out on the Colombo Creek at the Koorong Bridge and the Catfish there were very common. We brought small Catfish home and put them in the dams, and now they're breeding in my dams. I never saw a Catfish out of the Murray, the only other place I saw them was out of the Darling.

We used to fish down below Yarrawonga, that was where you'd get more of the white eyes and a lot of the grunter or silver bream, up to about 1960 we caught the white eyes there then they were pretty well gone, but you'd still get the odd grunter. There were more yellowbelly down there too. And now well there's a lot of small Trout cod down there. I've caught them up above the Hume Weir too. We used to have a combined clubs trip up at Dora and five or six years ago you'd get four or five Trout cod every trip, from a pound up to three pound. The biggest one was one in this rocky hole, I've seen him a few times, he'd be twelve to fourteen pounds. In the last couple of years they've declined a bit, you might get one or two; I think people might be keeping them.

OH 62

Charlie Aitchison of Yarrawonga was interviewed in October 2006 at an age of 87 years.

I grew up on the river, fished it all along, up past where the top of the lake is now, never in the Ovens. The river flats were lovely red gum forest, lots of lagoons. I knew it all could find every creek or run into the river, even in the dark! But the weir drowned it all, wrecked it. We used to get the redfin, Catfish, cod, yellowbelly, Silver perch and the black bream. The Catfish were good to eat; nearly all the lagoons had them. They were up to 8 to 9 pound, not quite 10 pound, commonly 3, 3½, 4 pound. Used to get a lot in the lagoon behind the slaughterhouse. We never caught them in the river, only the lagoons. The best way was to fish at night on the full moon. They were good to eat, we used to scald them and scrape them. Others skinned them. Only had one

main bone in them. We used to see their nests in the weeds, big spawns. After the weir filled they disappeared. They hung on in Ball's lagoon that was the last place, not many. The last one was caught there about 25 to 30 years ago.

The cod were common, most cod caught angling were about 5 to 6 pound. The bigger ones were caught on crosslines and drum nets. When I was 4 or 5 year old there was one caught that was 103 pound, by the French bloke Luke Dukai, don't know how you spell that. It was caught opposite the Yacht club, on the other side in the deep end of the river. We mostly used yabbies and mussels for bait. Got good cod on centipedes, sparrows, rabbit gut, anything.

Before the weir there were what they now call the Trout cod. We never called them that, they were called bluenose cod, had the little pointy mouth and the dark blue head. We got one now and then, not as frequent as the Murray cod, the biggest I caught was about 5 to 6 pound; that was about the size of them. They were good fighters. They were lovely to eat, better than the Murray cod, sweeter than them.

There was not a lot of yellowbelly around, just the occasional one. There were very few black bream in the river, just odd ones. There were a few more of the grunters or silver bream, but they were no good to eat. The tench, I never caught one, though lots of others said they did. The redfin have always been common, they were up to 4 or 5 pound, mostly 2 to 2½ pound. Never saw slimies here. I did catch a few brown trout, after the weir filled. I remember I caught a couple in the lake just after the war that were about 4 to 5 pound.

OH 63

Bert Roberts of St. James was interviewed in February 2007 at an age of 87 years.

I started fishing in 1934, 35 in the Murray around Cobrawonga. I grew up in the Devenish/St James area, live in St. James now. In 34/35 I can't remember any yellowbelly. We got Catfish out of the lagoons and the Cobrawonga Creek; you wouldn't get one till evening. The Catfish were about 3 pound, that was about the size of them, I saw the last one there about 1946/48. There are still odd ones in the lake; I saw one caught there last year. We used to get a lot of Catfish in the Broken Creek, about the same size, some a bit smaller. They finished in the Broken Creek in the 1943/44 drought, there was only two holes left near here. Prior to that in the Broken Creek there were beautiful Blackfish, up to 18 inches long. You could go out of the evening and get a feed of them, but they disappeared in the 40s, though little ones are now coming back. I don't think there were any Macquarie perch in there, but there were a few bream or grunter. There were cod in the Broken Creek too, but only the Murray cod.

The Macquarie perch in the Murray, you'd get an odd one, up to about 30 cm, fairly regularly up to about 1938. I caught the last one there just after the war, about 1946. When Eildon first filled in 56, in the dark up to about 10 p.m. you would get a bundle of them. The biggest ones out of the lake were about 5 pound; you'd get them on worms. There was a lot of grunter in the Murray back then; we never used to keep them. We got them up to 4 pound. When the war broke out, in the war I used to go fishing every evening at Cobrawonga. I was working there burning wood for charcoal, back in 1940. All we had was a bit of a sapling out of the forest, a bit of chord and a mussel for bait. What we caught we ate, so we didn't want anything bigger than about 6 to 7 pound. There was an old Swede bloke out there, he had a dog that would go out and dig out the crays. In those times you could see the big cod cleaning themselves on the sandbanks. One day the old Swede wanted to get this big old cod that was there in one hole. He got 6 carp, in those times it was legal to set setlines. Monday evening I went down to see him and all his meat had gone rotten. I saw him on the Wednesday laughing; he said "I got him. It was 106 pound and I took him into Cobram and sold him in the hotel. I booked into the pub, had a hell of a time!" When the war finished I got married, but fishing was my main sport. I used to go out to Cray Point a lot.

The other cod we called the rock cod, also they were called a bluenose. Back in the 30s and 40s the Murray cod would have been a bit more common, only a bit more than the rock cod. We always knew when we had one of them on, they pulled harder. The blue hole was always known for the rock cod, it was known for them. Back in the war we were getting these rock cod on aeroplane spinners for 3 days in one stretch of river, with a few Murray cod amongst them. Nobody wanted them, I gave a few away. This old bloke was a real bardie grub man; he would get them and put them in the lagoon. I've got a photo of a 42 pound rock cod I caught back in 1940 on an aeroplane spinner, at Cobrawonga; I caught a lot of fish that time.

I got another big rock cod that was 82 pound; I think the year was about 1980. He was got one evening about 10 o'clock on a bardie grub. I had a steel rod holder and it was bent flat on the ground. I picked the rod up, Christ this fish took off! I yelled to my mate, got in the boat to chase him. I had a gaff hook and I kept winding him in. I drifted towards this sandbar and I jumped out of the boat and gaffed him. I kept him alive for 4 days in a cage we built in the water to show people, then I let him go. He was nearly black in colour, and somebody must have lost him a while back, his top lip was torn. If you went down the river, after you left Cobrawonga, you didn't catch as many rock cod. We used catch both rock cod and Murray cod up at Granya, we used to camp on the Country Roads Board's place, we used to fish on this beach. We caught a lot of rock cod there up to the early 60s.

OH 64
The Late Bert McKenzie of Ruffy was interviewed in July 1982 at an age of 82 years
(From Trueman & Luker, 1992).
I've got one pet spot in the Murray at Cobram. Back at the time when they had that silly twenty one inch size limit. One bright moonlit night I was angling from a sandbank and I caught twenty seven cod and I kept three of them and those three were half an inch undersize. Those were both Murray cod and bluenose as that particular pool had both of them in it. That was during the 1950s. In Cobrawonga Creek in 1944 I caught a sixty six pound bluenose. I caught quite a few thirty pounders in Cobrawonga Creek. We caught them on the aeroplane spinner mainly. The thirty pounders were wicked to land! Even a twenty pounder was wicked.

I caught a twenty pound bluenose in Mulwala Lake. By golly did he rattle! Murray cod will hit hard but in two minutes he is giving it away and will float in to you. The Trout cod, he's still fighting. I caught one while I was fishing in twenty five feet of water for yellowbelly. I got that fish up to the boat twenty times I would say and zzzzzz you would have to let him go right to the bottom again. He was ten pounds and I got him on worms. I was never so sick of a fish in all my life! I wanted him to get away but I also didn't want to lose him. No, anyone that wants real sport, take him to some Trout cod water and just angle with worms. You may not get a bite as fast as you think you should but when you get your fish you've for to get him in. I could take you to three pools they were in and one further down though they were mainly Murray cod in that one. I was catching eight or ten of an evening four years ago up to about a pound, though I caught one seven pounder on a spinner and I got sick of him too!

I was in a lot of logs and he hit it and I had to hang on and he burnt all my fingers. I had to give him line. I was using sixty pound breaking strain line. I had kept the engine running and I set off for the other bank and he had to come to for a while. He would then lay doggo on the bottom and he wouldn't shift. Then he would get going again, he'd regain his wind and boom I was in trouble all the time. I had to keep the outboard going all the time as it was rapid water with plenty of logs to tip you over. I got to the sandbank on the other side and got out on the sandbank and got him in. I got a couple of five pounders too that trip. They were all Trout cod. In that particular area there was only Trout cod.

The most predominant difference between what we called the bluenose and the Murray cod was the shape. The bluenose was often longer and had an ugly pointed head whereas the Murray cod was usually in better condition. The bluenose was variable in colour as you could take one from out of a very deep hole and he's practically black but tether him up on a white sandbar and in half an hour he is white. He'll change his colour according to the background. The bluenose had a mottled pattern whereas the Murray cod is more heavily marked and is a lot more variable. Colour we used to go on a lot and the shape of the mouth of course. I think the Trout cod were thinner because they used to live in the faster flowing water and would have to expand more energy to stay put.

I used to use in the Murray, trout tackle for the bluenose and I could handle the bigger ones up to ten pounds. I got my rod tips broken, my ferrules split, made a real mess of my trout tackle when you got onto a bluenose. I caught two about thirty pounds on the spinner behind my boat with aeroplane spinners in the Murray below Yarrawonga and they towed me all around the hole for quite a while. You're disappointed when you find they're only thirty pounds! In the Murray of course I would poke around with a big bamboo rod with only a short line on it and toss into the whirlpools close to the bank and take a lot that way, and could do it still. But I can't walk around the banks now like I used to be able to then.

In a place near Yarrawonga there was quite a steep rapid up there and the first time I went up it a nineteen pound Trout cod hit me and went down those rapids and I went as fast as I ever have been in a boat! I got him! I very rarely went through that rapid without getting a six, eight, ten, or eleven pound Trout cod out of it, but always half way up the rapid on aeroplane spinners. That would have been from 1936 to 1938. The bluenose is still breeding at Cobram. I haven't fished up near Yarrawonga but they used to breed there, heavily. And there is no doubt about it; the cod is the fastest fish to put on weight there is - both cods.

OH 65
Ernie Jones of Tocumwal provided these comments in January 2007.
We got a mixture of the two types of cod here. They grey ones, the Trout cod; petered out below the Barmah Choke, up from there you got a mixture. I saw odd ones caught up to 60 pounds, the Trout cod. That would have been back in the 50s.

OH 66
Graham Vidler of Tocumwal was interviewed in January 2007 at an age of 63 years.
My dad was born in Tocumwal in 1919. He said the river used to be that clean, and he always came home with fish. They fished for the Blackfish or slimy, they used to catch them; he reckoned they were the sweetest of the lot of them. Murray cod, Macquarie perch he would catch, yellowbelly were also common, grunter or black grunters they were common too. They would grunt after they were put on the ground. And crayfish. Catfish, not from the Murray, he never spoke of them from the Murray. He didn't talk about redfin in the early days, but in the 40s and 50s you could catch a bag of them.

When I was young I had heard of some cod being called a bluenose, but I didn't know much about them. They used to catch tench and a different type of carp. The tench wasn't a bad meat, but it was bony and slimy. I can remember the Macquarie perch being quite nice to eat like a cod; they were pretty common here when we were kids. You could go down when I was a kid and catch redfin, yellowbelly, cod, the odd grunter, now and then catch quite a few Macquarie perch. You'd be talking about the 1950s. The Macquarie perch disappeared probably just after that.

OH 67

Jock Nicholson of Tocumwal was interviewed in January 2007 at an age of 77 years.

Dad was born and bred in Heathcote, one of four boys. I lived out at Trentham for a while. When we were young blokes and we would go for a drive he used to point out a couple of sanded up creeks between Heathcote and the Campaspe. He would say how he used to catch cod out of them when he was young. He also mentioned the Trout cod being there, how they were different, out there and in general. He was a fettler on the railways, got gassed in the First World War.

I was born at Bendigo, we moved to Gulpa, then Mincha near Pyramid Hill, I came up here over 30 years ago. At the Gulpa, you name it; all sorts of fish were caught in those days. I remember them putting out rabbit nets in the floodwater and they were gilling the bream. I can't recall many Catfish and can't recall any Macquarie perch. I was with dad in about 1950 at Yarrawonga, at the mouth of the 'dead river' about a mile below the weir, and he got a pair of Macquarie perch in the gill net. They would have been 2 ½ or 3 pound. We used to camp on the Berrigan turnoff, where the pro Paddy O'Brien was, and I caught one small one in the gill net there. That was about 1956, as well as another one below Yarrawonga. Never seen one since. There were Catfish in a lagoon on the north side of the river below the spillway at Yarrawonga. I'm talking about back in the 50s. There used to be a lot of trout, brown trout, in the river, particularly in the dead river, up to 15 pounds, and the odd ones here too.

The bream in the Gulpa, they were around the 2 to 3 pound mark, no great big whoppers. The yellowbelly were similar. The locals were always chasing cod; they were anglers, dad and dad's brother. The cod well they didn't fish big, so they got a lot around 6 to 7 pound, they never got any big ones, but there were a fair few of them. I've got no recollections of the older people out there talking about two types of cod, a Trout cod or a rock cod. But the blokes at Rutherglen, Wangaratta, Yea, they would talk about them in the 50s.Then I started catching them myself, when I first came here they weren't common. I remember I got one a pound and a half. Now it's no problem catching a dozen of the little things. There was always a fair few cod here, got a couple of big ones, on the crosslines and the springers.

OH 68

Hugh Dick of Tocumwal was interviewed in January 2007.

When I first sold the farm, between Yarrawonga and Cobram, we caught 160 odd cod, the biggest 125 pound. That was upstream from Barooga, caught in the hole right opposite, back about 93. There was an old fella who used to live below our homestead, when I was young he used drum nets, I can remember them hanging off the tree. Then you would see the cod on that cart going off to Melbourne. In the 50s and 60s we used to have a light on the front of the boat, you could see the Murray crays, we got cod spearing up to 100 pound on dark nights, wouldn't see anything when the moon was out. There was heaps of yellowbelly and grunter, identical in size, about 4 to 5 pounds. We used to get them off the sandbars on certain nights. We caught mostly cod, never thought much about the two types of cod, though we knew the Trout cod were there. The biggest Trout cod I ever saw back then was 11 pound. The other fish that was there was the tench, particularly in the creeks. I can go back 60 to 65 years, back to the 50s. In those days you could use the mussels in those days. The fish won't touch the mussels now, nothing will, it might be the pollution in them. The biggest change I have seen is the ribbon weed disappearing, and the slime. The carp ate the weed. The big fellas used to live under the weed, the cod.

OH 69

Ron Reynolds of Shepparton was interviewed in January 2007 at an age of 73 years.

I was born in 1935, my father Keith Reynolds was a keen fisherman. So was my grandfather. When my father was 8 years old he went out fishing with my grandfather up the Murray. My grandfather had a heart attack, the boat got tipped over, and sunk, they got the body later. That was up at the 'green engine'. Well he didn't go

fishing for about 5 years after that. The river from Yulupna Island through to 'the steps', just past where the Tongalong Creek comes in, well we knew that like the back of our hand. Old Percy Lucknan was a pro out there; he lived in a tin shed, made out of old kerosene tins all by himself. My father caught lots of cod out there, both types. The second type was the Trout cod, longer in the body, which made its gut look stumpier, and the nose was pointed and sort of purple. We caught a fair few in the 50s and 60s; the average was 15 to 20 pound, though they were caught up to 30 to 35 pound. I've never seen or heard of one out of the Goulburn, till they put them in up at Murchison East. There's plenty of small ones in the river between Yarrawonga and Tocumwal, where they have the closed season for them to breed. After the 56 flood, we caught lots of yellowbelly, the biggest went 10 pound 5 ounces. We also got a lot of goggle eyes, that's the Macquarie perch, all about 10 inches long. And a hell of a lot of grunter, 3 to 4 pound, the biggest 6 pound. But they're no good to eat, they feed on the weed. I've never seen a Catfish out of the Murray.

OH 70

Don Briggs of Shepparton, a Yorta Yorta elder, was interviewed in January 2007 at an age of 70 years.

I've just gone 70, was born and bred in the Barmah Forrest. My father was born in 1895, started fishing when he was 16 or 17. He mainly fished in the Barmah Forest, would go up the river as far as Yulupna Island. But when the water would drop, they would go up the Edwards; the river was smaller and kept higher. Dad used to fish with old Jim Rice, used to go from Barmah in dug out boats for 3 months, in the late 20s and early 30s, go from Barmah down the Edwards, fishing with drum nets. He would go up the Edwards once or twice every four to five years. Dad used to send me around the farms to swap the fish for a chook or a leg of lamb. The fish from the forest used to feed all of us Yorta people. There was a place, it's still called 'the Boughyards', our people used to build a little set across a little gutter, in a flood it would have 6 foot of water in it. They built it out of branches and leaves; they would catch yellowbelly in it. These were the stories handed down to me.

Dad used to take me out into the swamps and show me the nests, the nests of the Catfish, in the backwaters of the Barmah Forest. They would heap up the weeds; dad would show me every day, you'd see the fish. They were over a foot long, three to four pound, then they would be gone, dad would tell me they had hatched and left the nest. They were common when I was a kid, not quite to my teens, then they disappeared very quickly, I've never seen once since there though others say there have been odd ones caught. That was up to the time the redfin became common. The last time I caught a heap of Catfish was out of the Colombo Creek, we could get up to 70 a night, on bottles for floats. But once the carp came in, well, all the Cumbungi fell over, the Catfish needed the Cumbungi. After the carp they got scarce there.

The Macquarie perch were around at the same time as the Catfish, they lasted a bit longer. They were called a butterfish or a goggle eyes, they were beautiful to eat, the best in the river. We used to get them in the Murray up to five pound. They were common but not in big numbers, we used to get 2 or 3 a week in the drum nets. They lasted until I was a teenager; we were getting them like that certainly in 1944/45. There was an abundance of yellowbelly, dad would sometimes catch 40 to 50 in a drum net, couldn't pull the net out! There were floods back then, they needed it for their reproduction, it's totally different now. They were common at 5, up to 7 pound. The biggest was 32 pound, out of the Barmah Lakes, when I was kid; it was like a huge ball. We used to catch a lot of black bream, the grunters. When they are small they are silver, but when they get big they'd turn black. We used to get them in the gill nets, out in the forest. Dad used to mark the trees before the flood, where the fish would travel. When the flood came up, he would put in the gill nets, you'd get that many, they'd start getting in the net straight away. You had to pull the nets out. And plenty of yellowbelly too. After the war the people used them in stews, prior to that nobody wanted them, people said they were too tough.

The Murray cod were very common, the biggest I've seen was about 150 pound, when I was about 5.There was a drought about then, in the early 40s. The only way they could shift it was in a dray! To weigh it they cut it up and weighed the pieces. He fed all the people in the mission. In those days they would get the female cod in the

breeding season and if they had the eggs, they would squirt the eggs out of the female into some logs and get the milt out of the males and put it on the eggs. They'd make up a yard out of the logs; protect it with branches, in a foot or so of water, only if the temperature was right. After 28 days they eggs and young cod would be gone. The old people did that for years. That was before any of the inspectors were doing it, in the 20s, dad told me about it. It had to be done at the right time during the floods, the fish used to go out there and do it themselves.

My dad caught what he called a Murray trout, not the proper brown or rainbow trout. He talked about them in the Murray, he'd seen quite a few earlier; they were on the way out when I was young. The Murray trout was not green like a Murray cod; it was a dark blue on top and more motley on the sides than the Murray cod. He had a little beak for a nose, that went over the top of his bottom lip. The biggest ones were nearly all blue on top, darker on the back. In the big ones the markings were nearly the same as the Murray cod. The ones I saw were quite short and fat, I only saw a few. The biggest I saw was about 45 pounds in the Murray at Thistlebed near Picnic Point. I remember dad always used to say if they could get back up the river to the cold water they'd do better, they were more common up there. He did tell me he got a 42 pounder from Barmah out of a net, he never spoke of them being in the Edwards. The biggest one I got on a fishing line was a 20 pounder, the line was humming through the water, they just don't give up! They fight a lot harder and faster than the Murray cod that will lie there, even give up when you get him up off the bottom. They were the same to eat as the Murray cod. I got a few others when I was young that were smaller, I would have only got about three.

We used to get the tench, haven't seen one for years, though they tell me they get a few still around Picola and in the Broken Creek. Mum used to soak them in the vinegar to soften the bones, then you could eat them no worries. When I was young I can't remember any redfin, then the redfin came later, in my teenage years. When they first came the people were throwing them up the bank, they wanted the native fish. But then they got common, you couldn't get the native fish, so they had to eat the redfin. The brown trout we would get in the nets up to 7 to 8 pound, but after Hume filled we never saw them much after it filled. Maybe Yarrawonga too, the weirs stopped them moving, and the Macquarie perch and the Murray trout, everybody said those fish went up the rivers, and the weirs stopped all that. Into my teenage years well the river was green and clear, you could see the logs in 10 to 15 foot in the water. Now you can't see that. They took away all the swamps that cleaned out the sediment, put drains through the middle of them, and the water runs straight in. All the holes are filling up with the sediment; I can see the banks going in from all the boats around Echuca.

OH 71

Greg Norris of Kyabrum was interviewed in October 2006 at an age of 65 years.

Stan Green told me a lot about the past, he had worked on the river boats. I reckon I was young and keen, so he taught me a lot. Pop Green talked about how before the regulators went in on the rivers at 'the Gulf'; how they used to use sheep wire to trap fish in the creeks as the river went down. The large cod used to punch huge holes through the wire. He said they weren't caused by logs but by the animals. He was on the paddleboats. In 1914 the Murray went dry and the boats stopped. The fish were trapped in the mud holes. He talked about how the cows that came down to the water got bogged. The silver bream ended up eating the bogged cows to the bone. When I was young the silver bream or grunter were common in the Goulburn near here. Used to catch lots.

Stan used to talk about how common the white-eyed fish used to be. That's the Macquarie perch. Always talked about them. I've never seen one out of the river at Barmah, or anywhere along the Murray. The only place I have ever caught them was at Dartmouth. The Catfish, well I saw them caught at Picnic Point just after we got our licenses, would have been 18 or 19. About 1954/55 I saw some small Catfish at Galbray's property near the Swampy Plains River, just before the snowy scheme started. They were definitely not slimies; they were Catfish 4 to 5 inches long. The last Catfish I caught was in the Colombo Creek on Colombo station near Urana.

Stan was the first bloke to show me a bluenose. Prior to that I had caught a few and thought they were different. That's what the old blokes called them. I have heard them called a rock cod too. Over 40 years ago they were pretty common, from the Gulf down to Barmah. Then they got pretty scarce, but they started coming back in the 70-80s. They were caught from 35 – 40 pounds fairly regularly, as well as smaller ones. They had a different head to the Murray cod. Longer and the different jaws. The markings in the small ones were different to the Murray cod. When they got big in both types they are covered in small spots. The dashes you see in the small ones disappeared. We used to get them on the aeroplane spinners and on mussels. One of the school teachers, Laurie Bernard, had a new V-bottom boat. He caught a bluenose that was the full width of the boat, over four foot in length; I saw it, which he let go. He already had enough fish. They were caught to well over sixty pound.

The Winton Swamp was pristine before Mokoan. The water was crystal clear, and the redfin and Murray cod would swim past you while you were shooting ducks. After Mokoan it all changed.

OH 72
Max Clifford was interviewed at 'The Gulf' near Barmah in January 2008.
I'm only a lad, born in 1949, and me father was Laddie Clifford and my grandfather was Frederick J. Moloney. They were professional fishermen, my grandfather he died about when I was born. The Moloney's had the first store in Barmah, and the punt, they were here and started the pub, the store and the post office. My grandfather Clifford and my father wound that punt across the river from 1920 to 1942, every day. The people that wanted to cross they'd ring the bell; he'd go out in the middle of the night to bring them across. That was Jimmy Clifford, my grandfather. My grandfather Moloney used to put his twenty nets in, he'd work them for a week with a dug out red gum boat and a pushbike. He would row the boat downstream from Deep Creek at morning to Cape Horn with his nets and pushbike in the dug out boat and set his nets on the way down. Once he got to Cape Horn he would leave the boat there and ride the pushbike home. The next morning he would pushbike back to the boat, load it in and row upstream towards home checking his nets along the way collecting the fish. He used to send the fish to Melbourne, in cane baskets with wet gum leaves. They'd give him a green ticket saying half of them had gone off, he was being had. He bought the first Ford in Echuca in 1938 and started selling fish in Shepparton to stop being had.

I saw a lot with my old man. Nearly everything was here, he told us, slipperies, the ordinary bream, the goggle eyes or white eyes or butterfish. I remember seeing the Blackfish when I was a kid, we didn't know what they were. June's father told us what they were when we caught a couple. The goggle eyes and the Catfish I've never seen them here, seen the Catfish up in the Edwards, I caught one at Weman, but the old man said they used to get a lot here. The fish that I can remember was thick when I was young was the tench, and reddies. Old Laddie once got 128 bream, I was with him, I was only a kid. He had a dug out red gum boat and he couldn't pull the drum net in it was so full of these bream. He had to jump in to the freezing cold water and open the net to let them out, he used to go bloody crook when he got them! I remember seeing them up to 3 or 4 pound but my old mate Colin Walker said they would get them up to 6 or 7 pound.

The old man used to fish all year round, cut paths through the snags when the river was low. He said the cod used to travel up the river to spawn, up into the lakes, they definitely did. I've seen them crossing the sandbars myself. He used to put a cross line across the entrance with four hooks and every night he would have four cod on it. What they called 'The Choke' now is 'The Narrows' and the lakes, the old bloke said the proper choke was at Barmah, that was where the water slowed up. The yella's were thick at Barmah, more in times of high water. One day the nets would be full of bream, the next they would be full of yella's. The old man got a 24 or 25 pound yellowbelly in the Serpentine, him and old Eddie Major, June's uncle, over Pyramid Hill way, in a gill net.

It was as deep as it was long, it was a rare looking fish, it looked like a flounder. I got one 15 pound myself right near the Barmah Lakes.

The old bloke called the Trout cod a 'bluenose', he said they used to be thick here and upstream, and he got a few there out in the Goulburn too, at Stewarts Bridge. He used to seem to think there weren't as many further down the river, the river slowed down there; he reckoned they liked the faster water. He said there used to be some in the Edwards, but not a lot there. No, they were common from here up. Scobie Hand got one 65 pound up around here years ago. They're beautiful to eat, a lot sweeter than the cod, really good eating. A lot of the old blokes said they ate themselves out; they were biting all the time, not like the cod that would stop. They love the grubs, I got one with June's father one night, took all night to get him, he would pick away at the bait like a bream. He weighed 24 pound and there was a dozen grubs in him. The bream will do that too. The bluenose, when they're little, they've got lots of little spots, but when they get bigger the spots are further apart.

The Billabong was a good river for cod, yella's, Catfish and I also remember the grunters there years ago. Laddie said it was a good river to get cod from 5 to 30 pound and at times some very large cod were caught in the creek. It was also full of yella's and Catfish were common. The Catfish were mainly caught in gill nets, never in drum nets much, and Laddie never sold the Catfish. The cod hanging on the truck at Drac's were mostly caught in the Edwards River at Murgah Station. Laddie would fish about 15 mile up and downstream of Murgah. He said the Edwards was the best fishing river in NSW. When he first went to Murgah in about 1960/65 most of the cod caught were large. As the larger fish thinned out he started to catch smaller cod from 5 to 50 pound. Laddie also fished the Billabong Creek at Murgah and said it fished very well when it had water in it. The problem with the Billabong was getting to it. If it rained you couldn't drive on the black soil to get anywhere near the creek.

When I was young there used to be a slime in the river, it would pull your line in until your bells went in the water and then snap your pegs off if you didn't clean it every couple of hours. You knew when you had a fish on before you got to it because they would shake the slime off the line. They reckoned it was a filter that kept the water clean. Then, when the carp came it disappeared, the river turned muddy, bloody oath! Now it gets a bit clearer. The sandbars, there's very few below the lock at Torrumbarry, there's odd ones down there, but they're miles apart. It's up here and further that you get the sandbars.

OH 73

Norm Wilson of Cohuna was interviewed in January 2008 at an age of 79 years.

I was born in 29, back then it was no problem getting fish, I fished here all my life. When I was young the Gunbower Creek was full of redfin, they were caught up to 6 pound, and it was full of cod. We'd just go out with a bag of mussels, that's all you needed to catch cod. These days I use bardies they're the best bait, cheese is not bad, and the shrimps is about the best for the yellowbelly. The cod won't look at the mussels now, even the yabbies. Yes we'd go out with a bag of mussels and you'd catch cod mostly about 3 to 5 pound. I've seen them up to 70 pound out of the Gunbower Creek. About 1953 or 54 most of the cod died, they were floating up, still just kicking, we were pulling them out, we pulled them out up to 60 or 70 pound.

In the Murray down here every now and then you'd pick up one of these funny shaped cod, they'd be up to about 30 pound. They were known round here as a rock cod. The rock cod had an undershot jaw, and they were spotty, a bit like a cod but more spotty. I just got the book from the Murray Darling Basin Commission and tried to look up the rock cod but it wasn't there. They were like that Trout cod in the book, but they were never called that here. You'd get one now and again, in the Murray here at Cohuna, never saw one in the creek. I never saw small ones, the smallest would have been 15 pound, they weren't common just odd ones, nobody said they'd

ever been common round here. They had died out by the 1950s, I don't think there was any caught by the 60s. And the Macquarie perch or white eyes I never saw one and can't remember anyone talking about them.

The yellowbelly have just about disappeared, you get an odd one. We used to get hundreds of yellowbelly, we used to go down to 'the Cuts' where all the floodwater drains into the Murray, straight out from Cohuna, we'd take a four litre tin of worms, we'd get plenty around two and a half to three pounds. The biggest yellowbelly in the Gunbower Creek was 17 pounds. I saw a photo of the big one that come out of Kow Swamp it was caught by 'Fishy Davis', it was at the Koondrook Hotel I think, one of the pubs there years ago. I think the yellowbelly they've got scarce because we haven't had a decent flood in the river for fifteen years. Or the Darling, you get a big flood out there and the yellowbelly breed up and fill up all the rivers. The bony bream we'd now and then get one where we got the yella's at 'the Cuts' every now and then you seem to get them, you'd see them up to a pound and a half, even two pounds, though they're big ones. The Gunbower Creek used to be full of the buggers, they're gone now.

The grunter, there's more grunter around here than anywhere; we catch them up to two and a half pound. We used to get bigger ones up to five and a half to six pounds. They're no good to eat, nobody ate them, they used to throw them up the bank. They put up a good tussle, I throw them back. The Catfish they were common. I was talking to a mate and a while back he caught two out of the river so they still must be around. Oh yeah, Kow Swamp was always full of them, the Wakool was a great river for catties, not so much in the Gunbower Creek, more so in the Murray here. They died out, there were some good ones, two to three pound was a big one. I seen two catties in the last 20 year. Minnows there used to be a lot of them along the bank, the little cod used to live on them. It's been a long time since I've seen them, a long time ago, at least 30 years. The water's dirtier now; maybe you just can't see them. We caught an odd trout, 3 or 4 lb, once in a blue moon. A mate of mine two years ago caught a big eel, it was huge, he put it back in the creek

The redfin disappeared here overnight, and the tench the creek was full of tench they were thick here. I reckon they might have got a disease they went so quick, the redfin they just turned to jelly. The redfin and tench are gone, and the bony bream. We used to be able to get them by the truckload. Droughts, I've seen some bloody beauties! I reckon I've seen the river with hardly any water when I was out duck shooting just after the war. The early eighties was pretty bad too. Two to three years ago there was a big fire up in the hills, a lot of fish, and the yabbies crawled out on the banks. But the cod, it's the best I've ever seen for small ones, if you can't catch five or six of them there's something wrong, all undersize, but it's going to be good fishing in the future, I hope I'm going to be around to see it. A few years ago the cod disappeared for two or three years, then you started to get them again. There's still a lot of big ones around, the river up here is now full of weed, but I had a big bugger on I reckon he was forty to fifty pound, he was a beauty, but he got off, that's not long ago.

OH 74

Ian McDonald of Murrabit was interviewed in November 2006 at 93 years of age.

The biggest cod I've heard of in the district was caught by one of the fishermen out of one of the lakes, it was 163 pound. My brother saw it at the station in a basket on its way to Melbourne, with its tail hanging over the side of the basket! The Kerang lakes had lots of big cod in them. I went to school with a lad who fished all the time at Reedy Lake, he used to get them all the time 40 to 50 pound on a cross line. In the end the fishermen with a license netted them out as I don't think they bred in the lakes. I think they used to come into the lakes on the floodwaters.

In the Murray River at Murrabit there were lots of cod, any amount. When I was a kid the river was full of cod and the small ones well you could catch them on a piece of tomato, a red rag, anything. In the Merran Creek I used to catch a lot of cod, the biggest was 75 pound, though I got plenty from 40 to 60, any number. Got them there all on bait, carp, frogs, but mainly yabbies. The cod were common up to about the time of the war. Old

Jack Stewart had a fishing license, he was a top fishermen and a good bloke, he used to take me out fishing with him. He would get two cod for every one I caught! The cod in the Barr Creek, well he quite commonly caught 90 pounders out of it, and it really is only a small creek. It was pretty weedy creek at the time, but they dredged it into a channel and of course the cod went.

At Murrabit there was another cod, a blue coloured fellow, the Trout cod. He was slightly more pointy in the head than the normal cod and had grey markings. I only ever caught them in the Murray at Murrabit, never caught or heard of one out of the Loddon. I used to get the odd one, they were never common here, would have been lucky to get one of them for every twenty Murray cod though I was told they were common up in the Ovens, I had relatives that used to up there. No one ever talked about them ever being common around here. They didn't grow as big as the Murray cod, commonly 3 to 5 pound, the biggest one I saw was old Bill Ashwin my neighbour caught it, it went 14 pound, that was on a spinner. Thinking about it I only got them in the shallow faster water where it was a bit rocky, here in Murrabit. That was way back before World War 2, in the thirties when I was getting them, then they disappeared. During the war I caught one, that was the last.

Another one that disappeared off the radar screen was the little Blackfish, 7 to 8 inches long they were. There were lots of them in the Loddon, they were good to eat. I've not seen one since the war. I've never heard of the Macquarie perch here, no one has talked about them. There used to be hundreds of grunter in the river, and there were still here in big heaps in the 50s, then they declined after that though they are now catching small ones again. After the war we set a gill net in a backwater off Campbells Island and it ended up full of the damn thing! You couldn't eat them, they were just too weedy. The bony bream was another useless one to eat that was around. The yellowbelly have always been plentiful and there is now just as many around as ever. Well before the war they were usually caught from ½ a pound up to 4 to 5 pound, the biggest ones were up to 8 pound. In the dry spells they were always full of eggs.

The Catfish were so common in the Murray and in the smaller creeks. My brother caught one that went nine pound, but they were usually about 2 to 3 pound. That's another one that pretty well disappeared, though not completely, just before the war, at least in the river. I reckon the redfin had a lot to do with it. In 1936 we pumped out the big lagoon here and there were lots of redfin in it. A few years later we pumped it out again and there were catties in it, and the next time there were small cod in it. But most of the time in the lagoons well there was naturally a lot of redfin. A few years back we put some cod fingerlings into the lagoon and they did well, they grew up to 20 pound. The lobster, well I've been around the world and that is about the best fish to eat. These days you don't see the big ones, except for the females and you can't take them.

When I was a kid we used to spear the redfin in the channels, they were that clear. There was an old German fisherman, old Alf Hammel, he had a license and I saw him catch out of one the lakes some redfin that were 7 to 8 pound, they were monstrous things. In 1955 we had a fair flood and in 56 a monster flood. Well in the river the redfin bred up, you could fill a bag with them. The fishermen with a license used to get lots of tench, then they disappeared, the last I heard of them was in the late 50s. I reckon the locks might have had something to do with the cod becoming scarce as they couldn't migrate to spawn, but I think the redfin were the biggest factor, for all the fish, from the 30s on. The thing that has stuck in my mind was the onset of the redfin happened when the cod disappeared. The redfin proliferated in the wet seasons in the 40s and again in the 50s, and after that you didn't see a small cod for years. They are coming back, there must have been enough big ones left, and they have accounted for a lot of carp which are nowhere near like what they used to be.

OH 75

Henry George Washington Davies of Tyntynder South, a former professional fisherman, was interviewed in November 2006 at an age of 69 years.

There have been six generations of fishermen in my family here, starting with my great, great grandfather(Henry Davies), who came out from Wales, my great grandfather(George Washington Davies), then my grandfather (Francis Henry), my father, myself and my son, all been fishermen for a living. I've got photos of each us holding a big cod, 70 to 100 pound. There's one with my wife and I holding one that was 90 pound. My father, William John Davies, helped John Lake breed the first cod in New South Wales. They had concrete troughs that had been sprayed with diesel and the cod wouldn't use them, so they got some hollow logs and dragged them into the ponds. That's when they started to breed. Not long after that he had a heart attack and died, he is buried out there at Narrandera. My father caught the biggest yellowbelly, 54 pound cleaned near Piccaninny Creek at Kow Swamp about 1937.He got 2 pound sixpence for it.

When I was a kid we used to get the Trout cod around here. Bluenose was the common name for the Trout cod, that's what the old blokes called them then. They had a different head, big eyes, a dark bluenose, often the head was darker. Sometimes they had a stripe through the iris. Their colour, well they would go from a white, to a blue, to a dirty green to a dark blue, depending on the colour of the river and where you caught them. But mainly they were a darkish blue, particularly on the cheeks and between the eyes. The smaller ones tended to be whiter and more spotted. In the bigger ones the spots became more mottled, actually in both cods, but you could still pick them from the head and usually the colour.

They were only caught in two places around here, up at Willakool and at Wood Wood. Willakool is about 15 mile up the river from Swan Hill. It's on the NSW side of the river, where an anabranch comes out of the Murray on Pental Island, actually at Mellool. I left school when I was 14 to fish so that tells you how long ago it was, about then. They were considered the same to eat as the Murray cod, actually classed as the best, they were often long and skinny, and didn't have the fat in them as in the Murray cod, the old blokes preferred them. Back then well you usually didn't see a lot of people on the river, but you would see all these old blokes heading up to Willakool, they would say they were going to get themselves a bluenose. Yes, they thought they were about the best. You might go up there and see 40 or 50 of them along that stretch of the river, all the old blokes.

At Willakool up to 10% of the cod were the Trout cod, may be less, 8%.The river up there was a bit different, it was faster, they liked the faster water, they would come out of the big holes to feed in the shallows, off the sandbars, always in the moving water. Back in those days, just where the current slowed down a bit. Even though there were big holes in the river there, the water moved fast. We used to be drumming and you would always get them in the faster water, very fast. We used to hang the gill nets at the entrance to the lagoons, and you would pick the odd one up there too, just off where the fast water stopped.

We caught them at all sizes, the biggest ones I caught with my father were 60 to 70 pound, certainly that size. I saw one bloke catch one, old Jack Critchley, he had one bluenose in the boat and it was absolutely huge. He was shaking terribly, had the shakes real bad, we thought he was going to have a heart attack; it had given him a hell of a tussle. We used to sell our fish by the pound so we knew what they weighed, but this bluenose was bigger than anything we caught, it would have been 80 to 90 pound, certainly. Another unusual fish we caught back then at Willakool was the Macquarie perch, we used to pick up a few at 3-4 pound, maybe saw one that was 5 pound. My father called them the butterfish, they were never common. I saw odd ones caught at Beveridge Island below Swan Hill, but it would be well over 30 years since I saw one of them.

The other place in the Murray where we caught the Trout cod was at Wood Wood, down past Nyah. We used to pick up a few at Wood Wood, most were from 10 to 20 pound, the biggest went 28 pound there. We really only got a few there, saw more up at Willakool, but it was the same story at Wood Wood, the river was

shallower and faster there. The bluenose were so easy to catch, very inquisitive and cheeky. You would set a cross line, we were allowed four back then, and they would follow up the bait on the cross line. Sometimes they would take it, other times they just kept doing it. Up at Willakool we picked up a few trout, from time to time. Same thing, in the faster water there. My father caught a common trout, the brown, that weighed 26 pound, it was displayed in the town, but he wasn't allowed to sell it. We used to catch a few, but the trout were terrible eating.

With the Trout cod, well I am talking about over 50 years ago. We really only saw them in those two spots in the Murray. In one year we took out 354 cod at Beveridge Island and not one of them was a Trout cod so that tells you that they really were only in those spots, that type of water. We did a lot of fishing at Boundary Bend, Robinvale and Euston and in that time I didn't see a single Trout cod in those places. The only one I saw anywhere else was in the Murrumbidgee at Balranald. Back about 1980 in the Redbank Weir I caught one while I was setting a gill net. Well, all of a sudden there was a commotion but I got him in, he was about 6 pound, that's the only one I saw out of the Bidgee. Actually I used to pick up a fair few trout, browns and rainbows at Balranald. I did hear of Trout cod, odd ones, being caught up at Wellington recently.

The Trout cod disappeared years ago. I reckon it was the change to the flow for irrigation. Back then the river used to race through the holes, that's what they liked. But with the irrigation the river got slower and more constant. But recently there were 3 Trout cod caught near here, only about 3 to 4 weekends ago that were about 4 to 6 pound. They've come back in the river further up, between Yarrawonga and Echuca, and there's talk that people might eventually be able to fish for them again.'

The biggest cod I know of was 340 pound. It floated into a regulator at the north end of Kangaroo Lake, that was about 1948-49. My uncle was the one who found it, the water Bailiff Gordon Spark. I got one that was 146 pound cleaned below Euston in 1956, in the early months. It had its head stuck in the funnel, in the drum net. It was no problem getting it into the boat, it never even blinked. The old bloke in the boat with me, he nearly feinted, he thought I had a body! But then, when I got it out of the net it started jumping 3 feet high in the boat! Just before the 56 flood hit, the big cod knew it was coming, it was nothing to find big holes punched through the nets, they were all moving up towards it. I caught one in the Darling, in 1955 the only year it was open to fishing, out of the Darling, it was poor as anything, and it was over 8 feet long.

We used to get the Catfish out of Yanga Lake, they were usually from one to 8 pound, but we got one big one that went 20 pound. You could see their nests out in the sand. Early on you got less for the Catfish than you did for the cod, but later on when we skinned them and sent them to Melbourne, you would get 2 pounds for the cod and 3 pounds for the Catfish.

OH 76

Redge O'Connor of Benalla, formerly of Nyah West, was interviewed in March 2007 at an age of 85 years.

I grew up at Nyah West and I can remember at Nyah and at Vinifer the paddleboats. Dad would say "let's go get a cod" and we would go fishing and get cod all the time. Out there in the Vinifer swamp there were lots of clay banks, bridges and holes in which the fish lived under. We'd go to different places to catch the different fish, callop in one place; cod in another, the grunter were in other spots. You never really caught them all together, they were in different places. We never caught a Catfish at Nyah; I've caught them at other places but not there. My grandfather Vernon at Nyah got a cod that went 122 pound; he got it on a centipede. We used to go out where the sleeper cutters were cutting the sleepers for the railway. There would be big rolls of bark and you would get the centipedes in them. My grandfather would cut the head and tail off them so they couldn't bite you and stick them on a real hook, a big one.

The callop and the grunter were plentiful, we weren't so keen on them to eat, the callop. And the grunter were very ranky, they had a strong fishy taste. You got the callop, got them both up to 3 pound, the callop 3, 4, 5 pound. The grunter were up to about 3 ½ pound, it got me with a spike, I got a poisoned thumb from one, had a day off school. The cod we used to catch anything 6, 7, 8 pound, 22 pound, used to throw a lot of small stuff back. I remember once I fished at Patcha, well I swam across the river; I had a handline tied to my belt with a yabby on it. I set it up on a springer, went to the toilet and when I got back I had a 6 pound cod on it. Back then there were no spinners, as I got older the aeroplane spinner came in, and then the floppies, I have still got some floppies. At Nyah we used to get a rock cod, they were very scarce, hardly ever saw them. I thought they were a deformed cod. Later on when I moved over here from Bendigo, about 1950, they were in the Polly McQuinns Weir near Strathbogie. At Nyah and Polly McQuinns they weren't very big; a couple of pound was what you saw. The redfin they were in the Murray as far back as I can remember, when I was a boy. They were only small, there'd be shoals of them, tap, tap, tap, they'd go; they'd get the bait before the bream could. They were more or less a cannibal fish, they ate everything.

When I came over to Benalla the Broken here was full of the bream, the Macquarie perch, and cod. I remember there was lots of them in the Hollands branch and Ryans Creek as well as the river. They were pretty well originally everywhere in the river and the creeks right up into the hills, the bream and the cod. There was a little creek just out of town over Sherwell's Bridge; years ago it had the bream in it, and the cod, and beautiful Blackfish. I remember my son once said he was going to catch a bream; he only grabbed a landing net. The bream were going up the Hollands branch to spawn and they were that thick he brought home a couple he caught in the landing net. They were about 2½ to 3 pound. But when they put the channel from Nillahcootie to Mokoan, they broke into the Hollands branch with a pipe, used it as channel. When the bream tried to go up they couldn't get past there, well that stopped them breeding. They are coming back we are getting them now at the junction of the Hollands and Ryans and up at Williams Bridge.

There was one old timer here Frank Cook, he just passed away recently, I used to visit him, he was 97. He told me that when he was a boy back then all the creeks around here were full of cod slimies and the Catfish. He said the Ryans Creek, the Hollands Branch and the Back Creek had those fish in them and lots of bream. He said the Baddaginnie Creek was the same back in the 20s, he got Catfish and cod there too as well as slimies. And Myrtleford, he mentioned catching Catfish in the Ovens River in Myrtleford. And Little Back Creek, one lady told me that her grandfather used to catch cod there many years ago.

OH 77

Bill Lever of Wentworth, a professional fisherman, was interviewed in January 2007 at an age of 80 years.

I've just turned 80. I was born in Albury, moved to Melbourne, then Numurkah. I was fishing out of Cobram from 1954 to 59, then fished Wentworth and Robinvale. Around Cobram there were not many yellowbelly, it was just about all cod. There were some Macquarie perch, they were not really common then, you would pick up odd ones in the drum nets, but mostly on the cross line. They were usually around 2 to 3 pound. There were not that many Catfish, you picked up the odd ones in gill nets. There was bloody heaps of grunter, we got them up to 6 to 7 pounds.

Most of the fish I caught I sold in Shepparton. The Cod were up to 30 to 40 pounders, not many small fish. I remember some of the blokes in the area calling some of the cod bluenose; I did catch a few but didn't take much notice. I used to know old Ray Wilson; he fished the river from Yarrawonga right down past Wentworth. Old Ray used to tell me how he used to get the Trout cod when he worked out of Yarrawonga, but he never ever saw one down Wentworth way. He'd be close to 95 if he were alive now, so that's going a way back. What he said would be right, he was a real good drum net man, one of the best. Henry Davies knew him too, he'd tell you the same thing.

Those days the rivers were just teeming with redfin, they cleaned up all the fingerlings. After the 56 flood I fished the 'Bidgee in the Redbank weir, could easily fill up a ute with redfin! After I moved over here I fished out at Lake Benara, it was full of yellowbelly, grunter and Catfish, and heaps of tench. There were not many cod in the lake, but plenty of cod in the river. Down here we used to be able to drum net here all year, the Darling in the summer and the Murray in winter. But in the last 15 to 20 years the cycles have changed, Menindee holds the water back, then lets the shit water out. But we're not allowed on the river now.

The biggest yellowbelly I got was 20 odd pound at Beredee, got plenty of 10 to 15 pounders back in the 70s, up from Tibooburra out from Broken Hill. The Catfish, we usually got them about 2 to 3 pound, but down in Frenchman's Creek they'd be a bigger pest than the carp! Catfish are the best fish, good for children, only a few rib bones, babies won't get a bone in the throat. I think the carp did in the Catfish; the carp ate all the mussels and water snails. Before the carp your net pegs would be encrusted with the snails. The carp cleaned them up; the snails were the main food of the Catfish. And the mussel beds are all gone. The only odd thing I ever found in a cod, well I found one with a brand new golf ball in it, just before we got the old sack off the river! In the cod I found mainly yellowbelly and yabbies. The only other thing, a while back in the Frenchman, was half a perch of about 4 to 5 pound. He'd been scaled and bitten, a dirty big cod bit him in half like a shark!

When I first came down here they were all big cod, 35 to 40 pound plus, hardly ever got a little one. But after the 70s we saw a bit, then after the 91 flood, about 93 to 94, the next few years you'd get 15 to 20 small cod in a gill net. They were just undersized, every season after we went up an inch in mesh. They came from everywhere, plus heaps and heaps of perch.

16 Loddon River Catchment

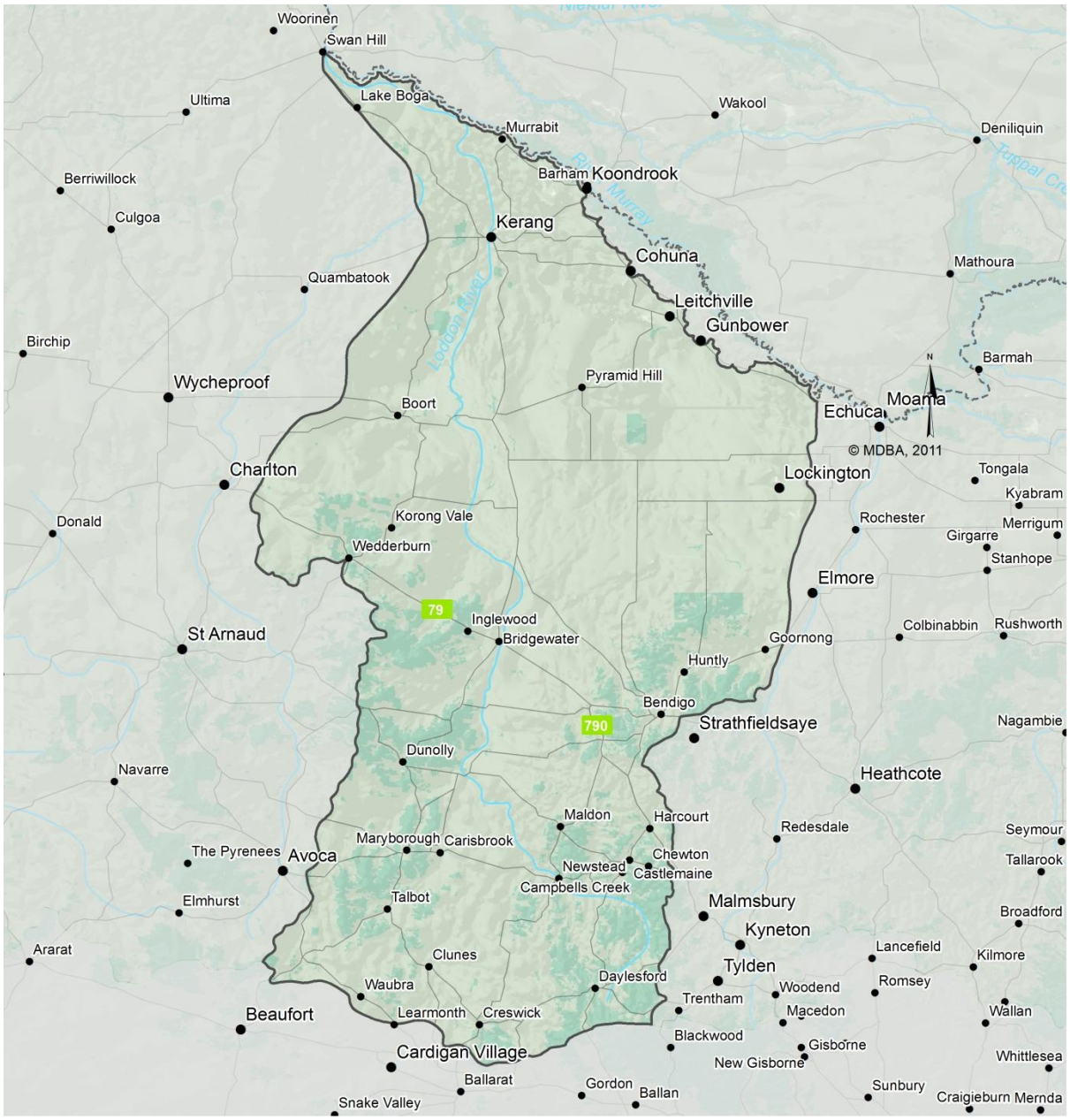
"*On* Saturday last," says the *Avoca Mail* of the 6th inst., "we saw at Maryborough a monster codfish, caught in the Loddon by Mr. C. Stein. Mr. Stein had caught a bream weighing 2lb., and before he could land it the cod came up and swallowed the smaller fish, carrying away the line. As Mr. Stein could not swim, he gave a boy half a crown to go into the water and get the line, and after some trouble the fish was landed. It was then found that the cod had paid the penalty of his rapacity by being choked by the bream, the tail of which was still protruding from the cod's mouth. The cod measured 3ft. 2in. in length and 2ft. 8in. in girth, and weighed 38lb. Some very good baskets of fish are being obtained in all the local streams, owing, it is supposed, to the water being so low. Most of the fish obtained about Avoca are, however, very small in size. Several river turtles have also been obtained."

Argus, 19 February 1877

"On Saturday last," says the *Avoca Mail* of the 6th inst., "we saw at Maryborough a monster codfish, caught in the Loddon by Mr. C. Stein. Mr Stein had caught a bream weighing 2lb., and before he could land it the cod came up and swallowed the smaller fish, carrying it away with the line. As Mr. Stein could not swim, he gave a boy half a crown to go into the water and get the line, and after some trouble the fish was landed. It was then found that the cod had paid the penalty of his rapacity by being choked with the bream, the tail of which was still protruding from the cod's mouth. The cod measured 3ft, 2in. in length and 2ft. 8in. in girth, and weighed 38lb. Some very good baskets of fish are being obtained in all the local streams, owing, it is supposed, to the water being so low. Most of the fish obtained about Avoca are, however, very small in size. Several river turtles have also been obtained."

Argus, 19 February 1877

Figure 16.1 The Loddon River Catchment showing major waterways and key localities.



16.1 Early European Accounts

The Loddon River originates in headwater areas draining extensive volcanic plains north of Ballarat and has a number of major tributaries. The Loddon River itself has its source near Daylesford, and flows north to meet a major tributary, the Jim Crow Creek, near Newstead. In the west the principle headwater streams are the Creswick Creek and the Birch (or Birches) Creek, the latter being originally known as the Bullarook Creek. These two streams meet near Clunes to form the Tullaroop Creek (sometimes called the Deep Creek) which flows north, collecting the flow of McCallums Creek near Maryborough before discharging into the Loddon River upstream of Laanecoorie. Downstream of Bridgewater the Loddon River has several anabranches, the largest being the Serpentine Creek. It also receives water from the Pyramid Creek - its source being the Bullock Creek, originating near Bendigo, and a small anabranch of the Murray River. The lower Loddon catchment contains a number of large permanent lakes fed by creeks, groundwater and floods from the river. Notable are the Boort Lakes adjacent to the town of that name, Lake Meran further downstream, and the Kerang Lakes which stretch between the towns of Kerang and Swan Hill.

Major Thomas Mitchell was probably the first European to sight the Loddon River in 1836. On June 21 from Mt Hope he observed a river in the distance, which was the lower Loddon, which he named the 'Yarrayne', probably the name used by the indigenous people for the area:

> Beyond the plain the line of noble yarra trees, which I had observed from Mount Hope, gave almost certain promise of a river; and at 6 1/2 miles our journey was terminated by a deep running stream. The banks were steep and about twenty feet high, but covered thickly with grass to the edge of the water. / The banks of this little river were however very different in some respects from any we had previously seen, being everywhere covered thickly with grass. No fallen timber impeded its course, nor was there any indication in the banks that the course was ever in the least degree affected by such obstructions (Mitchell, 1838).

On July 8 he crossed the river further upstream, apparently unaware that it was the same watercourse, at which point he named it the 'Loddon' after the river of the same name in his birthplace of Hampshire, England:

> The banks of this stream consisted of rounded acclivities and were covered with excellent grass. The bed was 18 or 20 feet below the level of the adjacent flats and, from its resemblance in some respects to the little stream in England, I named it the Loddon (Mitchell, 1838).

The squatters followed Mitchell, one of the first being Alexander Mollison. In 1840 Mollison established an outstation in the Loddon Valley named 'Jumcra' after a local indigenous word, the name latter being corrupted to 'Jim Crow' and applied to a local creek (*Kyneton Guardian*, 1935; Bride & Sayers, 1969). In July 1851 the first gold discovery in Victoria was made at Clunes, and shortly afterwards at Bendigo Creek, heralding the dawn of the Victorian gold rush. The following year gold was discovered at Forest Creek, leading to another rush and the establishment of the towns of Castlemaine and Chewton. Major discoveries also occurred at Daylesford in 1852, Maryborough in 1854 and a host of other localities, the upper Loddon proving to be extremely auriferous (Flett, 1979).

Thomas Martin grew up in the hamlet of Newstead during the gold rush and later reminisced about those times in a letter now held by the State Library of Victoria. Describing the period from 1858 to the early 1860s Martin made a number of references to the fish of the area:

> The Muckleford creek was close by where we used to get some nice fish. / They (the aborigines) used to fish in the Loddon + catch some nice fish. They used to spear them + sell some of them cheap to get tobacco. They

> would throw spears at them in the Loddon + seldom miss. I saw a fish caught in the Loddon which weighed 53 lbs, by a man called Mr Ball. He got a barrow + took it to the school for the children to see. The Loddon had some clear, deep waterholes (Martin, 1858).

The headwaters of the Loddon, in the Clunes area, were the source for Victoria's second effort in the acclimatisation of native fish. Cod and 'bream' were captured from the Tullaroop and Bullarook Creeks and transferred to Lake Burrumbeet on the outskirts of Ballarat in January and February 1858. The cod established a self-supporting population and flourished for many decades (*Ballarat Star,* 25 February 1858; Clements, 1988). Cod were also sourced from the Loddon River and introduced to the Wimmera River near Crowlands in 1861 (*Argus,* 26 March 1861). The reservoirs constructed on the goldfields also received liberations of native fish. An example of this was Expedition Pass Reservoir, near Castlemaine, which was stocked with 300 'bream, cod, carp and perch' in April 1873 sourced from the Barmah area (*Mount Alexander Mail*, 26 April 1873). The cod did well and apparently reproduced as cod of all sizes were reported to have been observed downstream of the dam when it overflowed during floods in November 1894 (Clements, 1988). Many years later it appears that there was an attempt to introduce the coastal form of the Blackfish to the upper Loddon River near Glenlyon, though details are sketchy (*Argus,* 26 September 1930).

An early observer of the gold rush was a resident of the Castlemaine area who corresponded with regional newspapers providing local news under the nom de plume of 'Miners Right'. In 1858 the author reported on the results of local anglers efforts:

> Apropos of the Loddon – everybody has taken to fishing lately on a Sunday, scores take tackle and go to try their luck, and generally it is good for the fish are cooped up in small holes, and are glad to bite at anything. A good number of females appear to be quite as lucky as their lords. I saw one man with twenty-seven fish – cod, bream, and something else, and they averaged about a pound each; some weighing three or four pounds have been caught, and even larger. It would not be too much to say that hundreds of pounds of fish have been caught in the Loddon the past two weeks, besides any number of crayfish (*Ballarat Star*, 25 February 1858).

Peter Beveridge, who settled in the Swan Hill district in 1845, recorded that lagoons and lakes in the region, which would have included the Kerang Lakes, contained an abundance of cod, Golden and Silver perch, Catfish and Blackfish (Beveridge, 1889). In Lake Boga cod and other native fish were so abundant that a local industry was established in 1869 canning the fish (*Argus,* 14 May 1869). Fae Stevens, in her history of the Boort district, recorded that in 1926 eight cod captured from Lake Meran were brought to a local hotel, the smallest weighing 49 lb. (22.2 kg) and the largest 74 lb. (35.6 kg). She also interviewed Frank Huggins, born in 1876 at Fernihurst, who recalled 'you could always catch a fish in the Loddon or Kinypaniel Creek. Once we opened up a 45 lb. cod and there was a 4 lb. cod in it' (Stevens, 1969).

Colonel John Langtry, in his post-World War Two survey of the inland warm water fishery, conducted surveys in the lower Loddon River and a number of lakes. He also as analysed professional fishermen's catch data from those waters. He observed that some of the lakes once carried substantial native fish populations but, by 1949, they were in serious decline. In the Loddon River itself Langtry highlighted the apparent absence of Trout cod and Macquarie perch (Cadwallader, 1977).

16.2 The Past Distribution of Fishes in the Loddon River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the Loddon catchment into a lowland zone (downstream of Maryborough and Baringhup), a slopes zone (upstream to Creswick and Glenluce) and an

upland zone beyond the latter locations. Very few headwater creeks exist in the montane zone. All the habitat zones discussed below match those in the *Sustainable Rivers Audit.* Native fish rarity scores were not developed by the expert scientific panel for the upland or montane zones.

Most of the information presented below is sourced from a limited amount of oral history (mainly OH 139-146) and a reasonable number of detailed newspaper accounts. Very few old photographs of catches of native fish in this catchment have been located. It is recommended that further historical research be undertaken in this catchment.

16.2.1 The Montane Zone

Only a few small streams penetrate into the montane zone of this catchment and there are no records of larger native fish being present.

16.2.2 The Upland Zone

Many areas in the upper Loddon contain waterfalls, notably between Glenluce and Glenlyon on the Loddon itself, which prevent upstream access by native fish. The main exception is in the west of the catchment south of Creswick. Blackfish were very common in upland habitat in both the Loddon River and creeks. They were captured in good numbers from the Loddon River at Glenluce and the Middleton Creek (Mudford, OH 139; Passalaqua, OH 142). Blackfish have survived to the present time in the Birch Creek (Saddlier, 2001). Newspaper accounts record that cod and 'bream' were common in the Tullaroop and Bullarook (Birch) Creeks near Clunes in the 1850s (*Ballarat Star,* 25 February 1858) indicating the likelihood that both 'bream', probably Macquarie perch, and cod may have penetrated into the upland zone in these streams and had a minor presence in the lower reaches.

16.2.3 The Slopes Zone

A number of newspaper accounts attest to the excellent fishing that existed for native fish during the gold rush and indicate that the slopes zone of the Loddon once held substantial populations of large native fish species. The *Argus* recorded that 'the Deep Creek and its tributaries, Macallum's Creek, Tullarook Creek, and Ballarook Creek, contain the Murray cod' (*Argus,* 14 April 1857). The translocation of cod and 'bream' from the Tullaroop and Bullarook Creeks near Clunes to Lake Burrumbeet (*Ballarat Star*, 25 February 1858) demonstrates the existence of a large cod population at that time in the upper reaches of the slopes zone. The Deep Creek was also used as a source for the translocation of cod and 'bream' to Lake Colac in 1858 where in two days 26 cod and 35 'bream' ranging from two ounces to five lb. (0.06 to 2.3 kg) were captured (*Argus,* 8 June 1858). Small tributaries of the Deep Creek such as the Mount Greenock (Back) Creek at Talbot also produced occasional captures of cod (*Argus,* 4 March 1867).

Further downstream in the Deep Creek near Carisbrook in one night's fishing 40 lb. (18.1 kg) of fish up to 18 lb. (8.2 kg) in individual weight were taken (*Hobart Mercury,* 24 January 1868). Thomas Martin's account from 1858 suggests that cod were very common in the Loddon River in the Newstead area (Martin, 1858). In 1917 it was reported that a group of Maldon anglers captured 22 cod up to 15½ lb. (7.0 kg) in weight for a total of 83 lb. (37.6 kg) from the Loddon River (*Western Mail* 16 February 1917) probably catching the fish at the bottom of the slopes zone adjacent to Maldon. Oral history recalls cod to have been originally very common to

abundant in the upper Loddon River upstream to the Loddon Falls between Glenluce and Glenlyon and in the Loddon River near Vaughan and Guildford (Mudford, OH 139; McDonald, OH 141; Passalaqua, OH 142).

The *Argus* reported that 'Bream, trout, cod, and hundreds of crayfish, have rewarded the efforts of anglers lately in Maccallum's Creek, near Majorca' (*Argus*, 3 January 1867). The direct reference to 'trout' being taken in 1867 in the McCallums Creek predates the introduction of exotic salmonids to the catchment. It occurred during a period when regional newspapers in northern Victoria regularly reported captures of 'trout' or 'Murray trout' which David Stead ultimately identified as referring to Trout cod (*Sydney Mail,* 27 November 1929). It is therefore likely that in this article, like the other contemporary newspaper accounts, the 'trout' were Trout cod. Later more detailed newspaper accounts specifically discusses 'Murray trout' further downstream near Kerang, confirming the presence of Trout cod in the Loddon River catchment (*Argus,* 3 March 1911, 8 May 1917). The article implies that 'bream, trout, cod' were common, and suggests a significant presence of Trout cod. The only photograph of a cod originating prior to the 1950s taken from the slopes zone is of a large Murray cod captured from the Vaughan area by Jack Dalmenico during the 1940s. Given the reported past abundance of Trout cod in slopes habitat in the adjacent Campaspe catchment (*Argus,* 17 March 1911) the available evidence suggest that both Murray cod and Trout cod had been abundant in the rivers and larger creeks of the slopes zone.

A fundamental question about the fish fauna of the upper Loddon is the identity of the 'bream' widely reported as being abundant in newspapers during the 1850s (*Argus,* 14 April 1857, 8 June 1858; *Ballarat Star*, 25 February 1858). Other accounts record the capture of 'Some fine black fish of from 3lb. to 4lb.' from the Loddon River near Eddington which are clearly not River Blackfish due to their size (*Argus,* 6 April 1870). 'Bream' were also recorded as being caught in numbers in the Loddon River, probably near Castlemaine or Newstead (*Ballarat Star,* 1858). The two potential native fish species that could have been described by the term 'bream' are Macquarie perch and Silver perch. One resident familiar with Macquarie perch has recalled past captures in the Loddon downstream of Laanecoorie (Bill Strong, pers. com.) and another in the Loddon River near Glenluce (Mudford, OH 139).

It has been suggested that Macquarie perch were naturally absent from the Loddon catchment (Anon, 1973) and that reported past captures of Macquarie perch in the Loddon River and its tributaries originated from translocated fish (Cadwallader, 1981). Macquarie perch were translocated from waters outside the catchment into the Bet Bet, Tullaroop and Deep Creeks in 1930 and into Lake Daylesford in 1931 (*Maryborough Advertiser*, 19 November 1930; Cadwallader, 1981). It is probable that the native fish translocated to Expedition Pass Reservoir in 1873 which were sourced from the Barmah area (*Mount Alexander Mail*, 26 April 1873) also included Macquarie perch. Ron Mudford, who was thoroughly familiar with Macquarie perch in the Campaspe River and who saw a small number of specimens caught from the upper reaches of the Loddon River near Glenluce c1930, recalled his father's stories of the species having once been common in the Loddon well before the translocations in the twentieth century took place (Mudford, OH 139).

Overall it is probable that the 'bream' in the upper Loddon were in fact Macquarie perch, for a number of reasons. The elevation of Clunes at 310 m exceeds the altitude of most locations in other catchments in Victoria where Silver perch were reported. There is no other example of Silver perch being common in creeks in Victoria at an altitude of 300 m ASL, but numerous examples of this being the case with Macquarie perch. In the nearby Coliban and Campaspe Rivers, Silver perch were taken in the slopes zone but only in small numbers, most 'bream' captures being Macquarie perch (*Argus,* 20 November 1908; Anon., 1976). Macquarie perch were present in the Murray River in numbers at least as far downstream as Euston (Cadwallader, 1977) and were present at Koondrook near the confluence of the Loddon and Murray Rivers (*Argus*, 18 December 1931) and so had access to the Loddon catchment. The 'bream' in the Tullaroop, Bullarook and McCallums

Creeks were very common, the Learmonth family catching 98 bream during their translocation efforts in early 1858 (*Ballarat Star*, 25 February 1858) and the accounts from the 1850s predate the earliest native fish translocations into the catchment in 1873. Collectively from the available evidence it appears that the rivers and creeks in the slopes zone of Loddon catchment originally supported a substantial Macquarie perch population.

Second hand oral history suggests that Golden perch may have been present in the slopes zone, with reported captures taking place near Guildford. The account lacks sufficient detail however, to make it conclusive (Dalmenico, OH 140). Golden perch are known to have been taken as far upstream as Laanecoorie Reservoir with 'bream' also being recorded in that water (*Argus*, 18 March, 1927). Silver perch have been documented to be present in the slopes zone in the adjacent Campaspe catchment (*Argus,* 20 November 1908). From this limited evidence and drawing inferences using the Campaspe catchment as a comparison it is probable that both Silver perch and Golden perch once had a minor presence in at least the lower slopes zone of the Loddon River.

Catfish were present in the slopes zone being recorded in the Tullaroop Creek at Clunes in 1851 (*Clunes Guardian*, 31 August 1920), and Ron Dalmenico recalled his father's stories of Catfish having been captured in the Guildford area (Dalmenico, OH 140). These two accounts suggest that the species had been regularly taken in at least small numbers. Blackfish appear to have been abundant in the slopes zone in both the river and creeks. They were reported to be present in the Tullaroop Creek at Clunes (*Clunes Guardian*, 31 August 1920), the Loddon River near Glenlyon (*Argus,* 27 November, 1925) and to have been abundant in the Loddon River at Glenluce (*Clunes Guardian*, 31 August 1920; Mudford, OH 139; McDonald, OH 141), the Deep Creek near Carisbrook (*Argus*, 19 February 1857), and the nearby Loddon River (Clements, 1988), Bradford Creek near Shelbourne (*Argus*, 18 June 1909), the upper Bullock Creek near Bendigo (*Argus*, 24 February 1905) and Joyces and Green Gully Creeks near Maldon (*Argus*, 21 December 1868). The Muckleford Creek was described as 'the rendezvous of anglers' where 'splendid blackfish have been taken' (*Argus,* 30 December 1862). In the Bet Bet Creek in one night out of one hole 12 lb. (5.4 kg) of Blackfish were taken indicating that they were abundant (*Argus,* 27 March 1866). Blackfish were also abundant in mining dams near Newstead (*Argus,* 27 May 1927).

A newspaper account records the presence of a 'small silver trout' in the Muckleford Creek which were probably galaxiids (*Argus*, 18 June 1909) and oral history records their presence in the Loddon River upstream of Castlemaine (Mudford, OH 139). Eels were also occasionally taken in the central Loddon catchment with recorded captures occurring in the Birch Creek, the Deep Creek near Eddington (*Argus,* 29 November 1921), and from the Loddon River near Glenluce (Mudford, OH 139). A number were translocated from the Merri River around 1905. It is unclear whether the slopes zone captures originated from this translocation or were from a natural presence (*Argus,* 29 November 1921).

16.2.4 The Lowland Zone

Cod were historically abundant in all lowland habitats in the Loddon River catchment. They were abundant in the Loddon River near Baringhup (Rumbolt, OH 143; Bill Rumbolt, pers. com.) and large catches were reported at Laanecoorie (*Argus*, 18 March, 1927), Bridgewater (*Western Mail,* 27 April 1912; Scholes, OH 144), near Fernihurst (Stevens, 1969) and at Canary Island (Chalmers, OH 145). As late as 1899 it was reported that a resident of Tarnagulla caught a hundred weight (254 kg) of cod from the Loddon (*Camperdown Chronicle,* 14 January 1899). Further downstream, near Serpentine in 1918, four anglers in one weekend took 43 Murray cod ranging from 5 to 10 lb. (2.3 to 4.5 kg) in weight (*Western Mail,* 15 February 1918). Cod were described as 'caught in abundance' at Bridgewater (*Burra Record*, 9 June 1926). Cod were abundant in the Barr Creek with

fish up to 124 lb. (56.2 kg) being taken (*Argus,* 21 August 1925; Ashton, OH 146; McDonald, OH 141; Photo LDR2) and were common in Kinypaniel Creek (Stevens, 1969). Cod were present in abundance in lakes and lagoons throughout the Swan Hill district, including the Kerang Lakes (Beveridge, 1889). Large cod were common in the Boort Lakes (Stevens, 1969). At Lake Meering (Meran), even after a substantial decline in the fishery, Langtry reported that in 1942 1814 kg of Murray cod was taken by commercial fisherman from the Kerang lakes (Cadwallader, 1977).

Previously the only definitive account about Trout cod in the Loddon catchment was Langtry's observation that they were absent in the Kerang area c1949 (Cadwallader, 1977). The correspondence received and published in the *Argus* from R. W. Harvey of Kerang of 'Murray trout' is a historically solid account of Trout cod, particularly when read in conjunction with the ongoing articles in the paper at that time (*Argus,* 3 March 1911). The newspaper later confirmed that Harvey had caught a 'Murray trout' at Kerang, pinpointing his capture in the Loddon (*Argus,* 8 May 1917). Harvey indicated that Trout cod were rare captures near Kerang, supported by the fact that he had difficulty obtaining a specimen for the *Argus* to allow museum examination, and oral history recalls their scarcity near Kerang (Ashton, OH 146). At this point the available evidence indicates that Murray cod were abundant in the lowland zone and Trout cod comparatively rare.

Blandowski (1858) recorded the Loddon aborigines as using the word 'Birnnett' for Golden perch. They have been taken near Laanecoorie (Rumbolt, OH 143) and were very common at Bridgewater (Scholes, OH 144). They were abundant near Kerang (Ashton, OH 146; Mick Ashton, pers. com.) and during netting in the Loddon River in 1949 Golden perch comprised 10.8% of the total catch (Cadwallader, 1977). Golden perch were present in the Loddon River near Canary Island (Chalmers, OH 145), in the Serpentine Creek, with fish up to 24 lb. (10.9 kg) being taken (Clifford, OH 72), and were common in the Barr Creek (Ashton, OH 146). A newspaper account records 'bream' being taken in the Laanecoorie Weir when it was drained in 1927 (*Argus*, 18 March, 1927) but the identity of the 'bream' is unclear. First-hand accounts record Macquarie perch to have, on rare occasions been taken in the Loddon River downstream of Laanecoorie (Bill Strong, pers. com.). Silver perch were caught in the Loddon at Serpentine and Canary Island (Mudford, OH 139; Chalmers, OH 145), were common near Kerang (Ashton, OH 146) and in the lower Loddon in 1949 comprised 34.9% of the total catch (Cadwallader, 1977). They had also been very common in the Barr Creek (Ashton, OH 146). Overall it appears that Golden perch and Silver Perch had been abundant in the Loddon River and the larger creeks, at least in the lower reaches of the lowland zone. The very limited evidence suggests that Macquarie perch were present but rare in this zone though they may have been more common towards in the upper reaches of lowland habitat based on their probable abundance in the slopes zone. Within living memory all three perch species have been scarce towards the top of the lowland zone.

Catfish had been abundant in the larger creeks, such as the Barr Creek, and were common in the Loddon River near the Pyramid Creek junction (Ashton, OH 146). They were very common near Canary Island (Chalmers, OH 145) and were present near Bridgewater (Scholes, OH 144). Catfish were reported by Langtry as having been common in some of the Kerang Lakes, including Brandy Lake, prior to the 1940s with 1361 kg of Catfish being taken by commercial fishermen from the Kerang Lakes in 1923 (Cadwallader, 1977). Blackfish were taken from the Loddon at Newbridge (*Argus*, 22 December 1924), were common near Bridgewater (Scholes, OH 144), abundant near Canary Island (Chalmers, OH 145) and Kerang (*Argus*, 18 June 1909; McDonald, OH 141) and were common in the Serpentine Creek and the lower reaches of Bullock Creek (*Argus,* 24 February 1905). Lampreys, probably Short-headed lampreys (Lintermans, 2007), were once common in the Kerang area, with occasional captures of eels taking place (*Argus,* 12 March 1909).

16.2.5 Estimates of Native Fish Abundance in the Loddon River Catchment at European Settlement.

Presented are the rarity scores used in the *Sustainable Rivers Audit* (Davies *et al.,* 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 16.1 Loddon River Catchment Rarity Scores (Main River Channels)

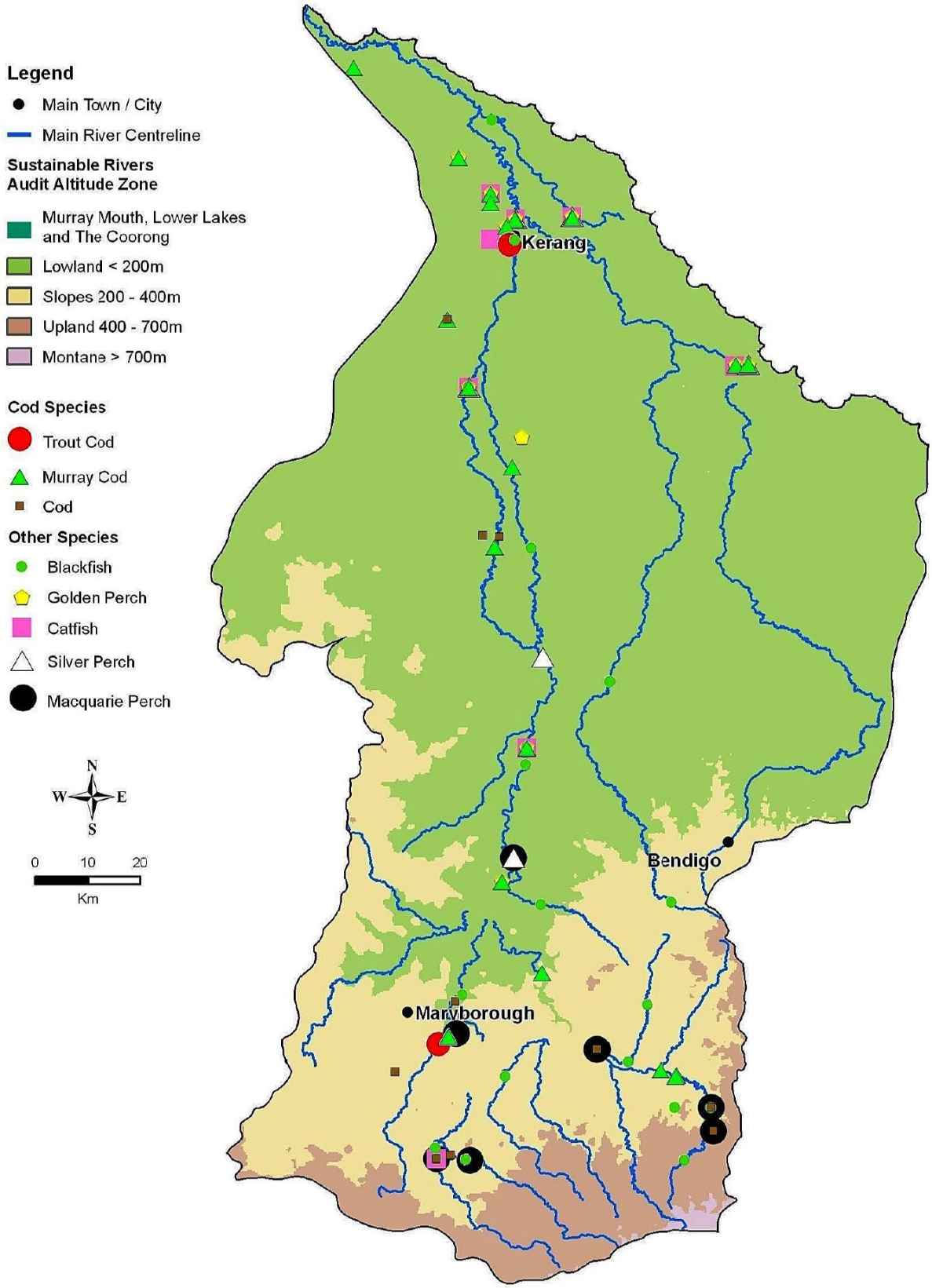
	Lowland (Murray River to Maryborough & Baringhup)		**Slopes** (Maryborough & Baringhup to Creswick & Glenluce)		**Upland** (Upstream of Creswick & Glenluce)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod	3	1	1	5	0	L1?
Murray cod	5	**5**	1	5	0	L1?
Golden perch	5	**5**	1	1?	0	0
Silver perch	5	**5**	0	1?	0	0
Macquarie perch	1	1	3	5	0	L1?
Catfish	5	**5**	1	1	0	0
'Blackfish'	3	**U3**	3	**5**	0	**5**

Key
0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type are supported by multiple accounts or lines of evidence e.g. Oral history, newspaper accounts, photographs.

Figure 16.2 Historical Records for Native Fish in the Loddon River Catchment



Photograph 16.1 Boort Cod Catch

Photo LDR1: A catch of Murray cod from the Loddon River, Boort area 1920s. George Garing on right holds a good cod. Photo courtesy of Len Lebner.

Photograph 16.2 A Big Cod Shot

Photo LDR2: A 124 lb. (56.2 kg) Murray cod shot in the Barr Creek under the Koondrook tramway bridge near Kerang 1939. On the left is Eddie Ashton, older brother of Mick Ashton who stands on the right. The Barr Creek once supported large populations of native fish including Catfish which were particularly prolific. The habitat was destroyed when the creek was turned into a channel as part of 'river improvement' works. Photo courtesy of Mick Ashton.

16.3 The Changes

16.3.1 Changes to Native Fish Distribution and Abundance

In the slopes zone accounts of an abundance of native fish in the 1850s and 1860' contrast with the oral history post-1920s, indicating a general scarcity particularly in the upper reaches. The lack of information in the intervening years makes it difficult to pinpoint precisely when species declines took place. The last written account of 'bream', probably Macquarie perch, being caught, originated from near Maryborough in 1877 (*Argus*, 19 February 1877). The only first-hand account of a perch species other than introduced Redfin perch in the slopes zone in the twentieth century are Ron Mudford's recollections of a few Macquarie perch being taken near Glenluce c1930 (Mudford, OH 139). About that time efforts were made to source Macquarie perch for stocking local waters, suggesting that there was concern about their status in the area (*Maryborough Advertiser*, 19 November 1930; Cadwallader, 1981). A few years later the Maryborough and Maldon Angling Clubs convened public meetings to discuss the serious decline that had taken place in the local native fishery, and to take action to restore specifically populations of Macquarie perch and cod (*Argus,* 29 May 1935, 29 April 1936). It appears that Macquarie perch underwent a dramatic decline in the late nineteenth century, becoming extinct in the slopes zone in the 1930s.

There are no accounts of cod being present in the upper slopes zone in the upper Tullaroop and McCallums Creeks after the 1850s. Further downstream, newspapers record good catches of Cod in the Tullaroop Creek into the late 1860s (*Argus,* 24 January 1868). They were rare upstream of Castlemaine by the 1930s (Mudford, OH 139) but were still common in the Loddon River near Vaughan and Guildford at that time. By the end of the 1940s they had become rare at Vaughan and Guildford (Passalaqua, OH 142). Overall cod populations appear to have steadily retreated downstream with a virtual disappearance by the Second World War. The only record of Catfish in the twentieth century is a family's stories of their presence near Guildford, originating prior to the Great Depression (Dalmenico, OH 140). As early as 1862 it was reported that a serious decline in the abundance of 'blackfish' in the Muckleford Creek had occurred due to siltation associated with mining activities (*Argus,* 30 December 1862). Another account implied a decline had occurred in the Bradford Creek near Shelbourne by 1909 (*Argus*, 18 June 1909). After the Second World War, Blackfish disappeared from many streams but still remained common in others (Ron Mudford & Frank Passalaqua, pers. com.). Since that time they have been the only large native fish found in any numbers in the slopes and upland zones of the Loddon

In the upper lowland zone near Laanecoorie Bill Rumbolt's recollections suggest that native fish populations had seriously declined by the 1930s with cod being the only species captured in any numbers. Small cod were scarce, Golden perch were very rare and Silver perch and Catfish were absent (Rumbolt, OH 143). The last account of 'bream', most likely Silver perch, in any quantity at Laanecoorie dates from 1927 when the weir was drained (*Argus*, 18 March, 1927). Golden perch and Silver perch were scarce as far downstream as Serpentine, Bridgewater and Canary Island by the 1930s (Scholes, OH 144; Chalmers, OH 145). Near Bridgewater in 1932 'fair catches' of cod were reported (*Argus,* 11 January 1932) but a major decline occurred in the cod fishery after large fish kills that occurred during that decade (Scholes, OH 144; Chalmers, OH 145).

Near Kerang, cod, Golden perch, Silver perch and Catfish were very common in the Loddon River and Barr Creek during the 1930s but declines were evident by the Second World War, particularly Catfish which disappeared very quickly (Ashton, OH 146; Mick Ashton, pers. com.). Langtry reported the belief of professional fishermen that worked the Kerang Lakes, who maintained that declines in native fish populations occurred in the 1920s and presented a graph showing reduced catches of 'Murray fish', which comprised native species and Goldfish, supporting their claim. By the late 1940s Catfish, once prolific in Lakes Boga and

Brandy had disappeared, and Murray cod, Golden perch, and Silver perch were only being taken in small numbers from the lakes (Cadwallader, 1977).

16.3.2 Changes to Habitat

The catchment of the upper Loddon underwent severe environmental disturbance during the gold rush (*Argus*, 16 October 1865). Initially alluvial working of gold took place. This was followed in some areas by underground working of deep leads and quartz reefs (Flett, 1979). By 1862 mining sludge was filling the Muckleford Creek and 'holes that formerly were clear as crystal are now as muddy as Forest Creek' with an associated decline in the fishery (*Argus,* 30 December 1862). Used mine tailings were discharged down the Deep Creek at Clunes, causing considerable public concern (*Argus,* 25 November 1881). Gold dredges also operated in the catchment with the last operating in the Newstead area well into the twentieth century. Perhaps the most devastating impact was produced by the introduction of hydraulic sluicing of alluvium in the Castlemaine district in the twentieth century which loosened massive quantities of top soil, introducing sludge into the Loddon River. This activity caused extensive silting of the Loddon River to the extent that by 1930 half of the storage capacity of the Laanecoorie Reservoir had been lost (Scott, 2001). It was reported that in the course of a few years' holes in the Loddon that were 15 feet in depth had completely silted up (*Argus,* 5 March 1937). Of all the catchments in Victoria the Loddon probably experienced the most extensive changes due to the gold rush.

Large fish kills were regularly reported in this catchment and were often associated with the activities of miners. In 1865 hundreds of Blackfish died in the McCallums Creek, with previous kills being recalled and linked to the washing of sheep (*Argus,* 19 October 1865). Two years later hundreds of fish died after heavy storms in the Deep Creek upstream of Carisbrook (*Hobart Mercury,* 9 March 1867). During parliamentary debate in 1881 it was stated the Loddon River at Kerang had been polluted by nine million gallons of water daily by mines in the Maryborough area (*Argus,* 25 November 1881). In 1920 cod and perch died in the Loddon (*Argus*, 16 January 1920) and in the 1930s there was a series of large fish kills, recalled in the oral history and documented by newspapers. In January 1935 fish were killed by cyanide pollution in the Birch Creek (*Argus,* 11 January 1935). Later the same year, large numbers of fish were killed by pollution at Newstead (*Argus,* 23 December 1935). In November 1936 pollution by 'alum' in the Loddon River resulted in stock refusing to drink the water between Guildford and Baringhup which also killed fish (*Argus,* 26 November 1936, 11 December 1936). It has also been suggested that during drought in the 1940s water from mines was sent downstream to maintain supplies and this water also adversely affected fish (Rumbolt, OH 143). The mining pollution killed cod from Guildford to as far downstream as Canary Island, after which time cod were scarce upstream of the Kerang area (Rumbolt, OH 143; Chalmers, OH 145). By the 1980s the catchment was considered highly degraded with indications of dryland salinity being evident in the lower reaches (Schoknecht, 1988).

The upper Loddon was the starting point for the acclimatisation of a number exotic species in the Murray Darling Basin due to the very active acclimatisation society which existed at Ballarat, as well as one at Castlemaine. The absence of sizeable angling fish in some of the lakes located on the tablelands near Ballarat was the original motivation for the translocation of cod into Lake Burrumbeet in 1858 (*Ballarat Star*, 12 December 1857). By the 1860s, Redfin perch and Tench had been received from Tasmania and placed in waters near Ballarat (Clements, 1988). In 1872 thousands of Redfin perch were released into Birch Creek at Clunes (*Australasian*, 31 August 1872), the Muckleford Creek was stocked two years later (*Argus,* 27 August 1874) and in 1875 54,000 fish were released in the Maryborough area (*Argus,* 3 December 1875). In 1873 'gouramis', most likely *Osphronemus goramy,* which had been previously introduced to Middle Gully Reservoir and become established were sourced from that water and spread elsewhere (*Argus,* 21 August 1873). In the lower reaches of the catchment the state Water Supply Department introduced Redfin perch into irrigation

channels near Macorna to control crayfish where they became established by 1893 (*Argus,* 18 December 1893).

By the 1930s Redfin perch dominated the Loddon River and its tributaries as far downstream as Kerang (Rumbolt, OH 143; Chalmers, OH 145), and at Laanecoorie Reservoir a party of anglers took 90 in a few hours (*Argus,* 24 May 1934). Langtry presented professional fishermen's catch data from the Kerang Lakes dating back to just after the First World War and, as early as 1923, Redfin perch represented 27% of the total catch. He reported the belief of professional fishermen that declines in native fish populations coincided with the periodic proliferation of Redfin perch and presented a graph showing reduced catches of 'Murray fish' when Redfin perch were common in the lakes. Redfin perch catches plummeted during the 1930s when other species were once again caught in numbers, but recovered during the 1940s and the other species subsequently declined severely. Langtry also highlighted the disappearance of Catfish in some lakes during the Redfin perch explosion. From Langtry's data it is clear that by the 1920s introduced species in the form of Redfin perch, Tench and Goldfish dominated the fish fauna of the Kerang Lakes (Cadwallader, 1977), a dramatic change compared to the situation described by Peter Beveridge in 1845 (Beveridge, 1889).

Trout were first introduced to the Loddon catchment in 1872 when 150 fish were placed in the Harcourt Reservoir. They were subsequently introduced to other waters throughout the catchment (Clements, 1988). By the early twentieth century trout were abundant throughout the upland zone and were regularly taken as far downstream as Laanecoorie (*Argus,* 26 September, 1908, 31 January 1925, 18 March, 1927; Clements, 1988). Tench, which were introduced around the same time as Redfin perch, became common in reservoirs in the upland zone and were abundant in the river and lakes in the lower reaches (*Argus,* 18 March, 1927; Rumbolt, OH 143; Chalmers, OH 145). Goldfish, recorded as 'carp', were widely dispersed to reservoirs near Castlemaine in 1873 (*Argus,* 21 August 1873). They were first reported in the Barr Creek near Kerang in 1914 and by 1926 were described as 'abundant' and 'swarming' in the Loddon and other streams (*Argus,* 22 October 1926; Cadwallader, 1977). European carp arrived in the lower Loddon towards the end of the 1960s and progressively made their way upstream (Mick Ashton, pers. com.).

While a number of modest reservoirs had been constructed during the gold rush in the Bendigo, Castlemaine and Daylesford areas for mining purposes, eventually others were constructed for the regulation of the waters of the Loddon to mitigate flooding and guarantee water supply during drought. The first major storage was the Laanecoorie Reservoir near Dunolly which was completed in 1891. A large flood in 1909 almost destroyed the structure which was subsequently repaired and ultimately enlarged in 1935. Other smaller weirs were constructed at Fernihurst and Serpentine. It has been suggested that these weirs blocked upstream fish passage, reducing the abundance of native fish further upstream (Rumbolt, OH 143). After the Second World War much larger impoundments were constructed, including Cairn Curran Reservoir on the Loddon River near Newstead, completed in 1955, and Tullaroop Reservoir on the Tullaroop Creek near Maryborough, completed in 1959. With their construction, flows in the Loddon River have become regulated and increased extraction combined with a reduction in runoff has greatly reduced flows (NCCMA, 2010). Increasing demands on the water supply and excessive extraction have resulted in the cessation of flow during the recent drought (Chalmers, OH 145).

Photograph 16.3 A Ruined River

Top, Photo: *State Library of Victoria* b47591, H96.160/21. The upper Loddon River once held significant populations of native fish. Much of the catchment was drastically altered by the gold rush and most of the rest cleared for agriculture. This image of two anglers fishing the Loddon, probably in the slopes zone, was recorded by the Anglo-Australasian Photographic Company around 1879 and provides a good indication of the original environment.

Bottom, Photo: *State Library of Victoria* b44721, H91.50/958-967. This image of the Loddon River near Castlemaine shortly after the Second World War shows the stark changes to the environment less than a century later. Both photographs reproduced with the permission of the *State Library of Victoria*.

16.4 The Current Situation

The *Sustainable Rivers Audit* concluded that 'the Loddon Valley fish community was in Extremely Poor Condition, with losses of native species, low abundance of native fish and intrusions by alien species, especially in the Slopes Zone' (Davies *et al.,* 2008).

Today the Loddon River provides some reasonable fishing for Murray cod and Golden perch from near Kerang downstream to the Murray River. Silver perch have a modest presence, but Catfish are rare and the Kerang Lakes are dominated by European carp and Redfin perch. The Tullaroop and Cairn Curran Reservoirs provide fisheries sustained through stockings of Golden perch and Murray cod, with occasional captures of these species upstream of these storages (McGuckin & Doeg, 2000). Climate change modelling suggests that the Loddon catchment will be particularly severely affected with reductions to inflows from 34-74% (NCCMA, 2010).

16.5 Newspaper Highlights

Argus, 19 February 1857
The Deep Creek near Carisbrook, is plentifully stocked with fish, and some very fine examples have recently been caught, one gentleman having safely landed a cod which weighed only an ounce or two short of twelve pounds, while a party of young amateurs at the sport being satisfied with smaller fry caught seven dozen black fish in a short time.

Argus, 14 April 1857
The Deep Creek and its tributaries, Macallum's Creek, Tullarook Creek, and Ballarook Creek, contain the Murray cod within six or eight miles of that Lakes Learmonth and Burrambeet / At the large water-holes at Clunes, and on Macallum's Creek, the cod can be caught

Ballarat Star, 12 December 1857
A Supply of Fish. / As it is well known that the Murray cod is found in the Tullarook and Bullarook Creeks that flow past Clunes, and distant only about twelve or fourteen miles from Lake Learmonth

Ballarat Star, 25 February 1858
The Murray Cod in Lake Burrumbeet
The introduction of the Murray cod into the waters of Lake Burrumbeet has been at last brought to a successful termination by Messrs. Learmonth. We hope in a few days to be able to furnish our readers with some details of an experiment which has excited considerable interest, and promises to be of great and permanent benefit to our population. Meantime we may state that after several journeys, 98 bream and 34 cod have been placed into the waters of the lake, where we sincerely hope they will increase and multiply . . .
Fishing In The Loddon. – Apropos of the Loddon – everybody has taken to fishing lately on a Sunday, scores take tackle and go to try their luck, and generally it is good for the fish are cooped up in small holes, and are glad to bite at anything. A good number of females appear to be quite as lucky as their lords. I saw one man with twenty-seven fish – cod, bream, and something else, and they averaged about a pound each; some weighing three or four pounds have been caught, and even larger. It would not be too much to say that hundreds of pounds of fish have been caught in the Loddon the past two weeks, besides any number of crayfish. If the weather continues, the fish will get pretty well thinned. 'Miners Right'

Argus, 16 October 1865
Over and over again we have urged that steps should be taken to protect our forest lands, not only because extravagance will lead to scarcity, but also because the local climate will be affected in all those places where the forests are removed. In protecting the forests we do more than increase the growth of timber - we prevent waste of soil, we conserve the natural streams, it is not improbable that we prevent decrease in the rainfall, and it is certain that we largely affect the distribution of storm waters. / it is not surprising that our best streams, such as the Loddon, Campaspe, and Avoca, are fast becoming mere channels for the efflux of sludge and sand. Even in those parts not touched by the gold-miner, the rivers are rapidly changing their character. The mere occupation of the country for pastoral purposes has produced great changes, and it is well to consider whether anything can be done to compensate for, if we cannot check, this kind of devastation.

Argus, 3 January 1867
Bream, trout, cod, and hundreds of crayfish, have rewarded the efforts of anglers lately in Maccallum's Creek, near Majorca. The Deep Creek has also afforded good sport.

Argus, 19 February 1867
The Deep Creek, near Carisbrook, is plenti-fully stocked with fish, and some very fine samples have recently been caught, one gentleman having safely landed a cod which weighed only an ounce or two short of twelve

pounds, while a party of young amateurs at the sport being satisfied with smaller fry caught seven dozen black fish in a short time.

Hobart Mercury, 9 March 1867
Piscatorial pursuits are being earned on with great success just now in the Deep Creek, above Carisbrook. Some of the most enthusiastic fishermen continue the pastime in a systematic manner, and one day last week caught half a dozen fine cod, weighing 221b. They are frequently caught from 81b. to 121b. weight. The late thunderstorm seems to have had a fatal effect on the fish, for great numbers were found dead, while others were so stupefied that the children easily captured them without tackle. The anglers were grieved to see such quantities of the fine fish lying dead on the banks without having been landed there with rod and line.

Argus, 24 January 1868
We also learn that the Deep Creek, near Carisbrook, fishing operations are now being carried out with great success, as we hear of several fine hauls of large fish last week. One fish weighing eighteen pounds was caught below Mr. Crook's tannery, and we are informed that a professional fisher of our own neighbourhood took upwards of forty pounds weight in one night's fishing, some of the fish being from ten to twelve pounds each.

Mount Alexander Mail, 26 April 1873
/fish arrived in Castlemaine consigned from the Acclimatisation Society of Echuca to societies here and in Geelong. They had been caught by a man named John Evans on Tuesday, Wednesday and Thursday nights, and were brought under his care; amongst the lot (some 800) were bream, Murray cod, carp, and perch, the largest being about four inches long / 300 were placed in Expedition Pass Reservoir, 50 in the Hospital Dam, and the rest went to Geelong.

Argus, 19 February 1877
On Saturday last / we saw at Maryborough a monster codfish, caught in the Loddon by Mr. C. Stein. Mr. Stein had caught a bream weighing 2lb., and before he could land it the cod came up and swallowed the smaller fish, carrying away the line. As Mr. Stein could not swim, he gave a boy half a crown to go into the water and get the line, and after some trouble the fish was landed. It was then found that the cod had paid the penalty of his rapacity by being choked by the bream, the tail of which was still protruding from the cod's mouth. The cod measured 3ft. 2in. in length and 2ft. 8in. in girth, and weighed 38lb. Some very good baskets of fish are being obtained in all the local streams, owing, it is supposed, to the water becoming so low.

Argus, 18 June 1909
Variations in Blackfish. This subject has excited very general interest. "Angler" (Kerang) writes:- "Re size of blackfish. Those who would regard the close season law here would be glad to have the question of whether blackfish, as we call them here, are the kind legislated on or not. Many of us firmly believe that they are not, and that our variety hardly ever, if at all, grows to weigh more than one pound. Regarding 'blackwood's' contention that the Murray cod keep them down, how is it that in the Bradford Creek, a tributary of the Loddon, flowing through West Shelbourne and Laanecoorie, we used to catch thousands of blackfish, and never one over a pound weight? Cod fish were unknown, the only other companion of the blackfish being a kind of small silver trout. Personally, I have fished both the Bradford and the Loddon for the last 20 years, but have never caught, or heard of one being caught, any over a pound in weight. Some have ascribed the smallness to the warmth of the waters up here in the north."

Argus, 3 March 1911
"Murray Trout". "Nearly all the anglers I have met here," writes Mr. R. W. Harvey (Kerang), "as well as those in the Mildura District, declare that there is a fish in the northern rivers which they call 'Murray trout.' They describe it as resembling the Murray cod, but the markings are different. The fish is a finer shape, and, without

doubt, a garner sporting fish. Has such a fish, to your knowledge, been scientifically noted? Some time ago I got a few at long intervals, and was unfortunate enough to lose the specimen that I intended sending to Melbourne to have identified. I am endeavouring to obtain a specimen, and may yet succeed. I am by no means sure that it is a distinct variety, though the professional fishermen seem to be very certain about it."

Western Mail 16 February 1917
A Victorian newspaper says that numerous fishing parties from Maldon frequent the Loddon River, and some good hauls are being reported. On the 26th Mr. W. Blenheim and party landed 83lb. of cod (22 fish in all), one turning the scale at 15½lb. The Loddon has always been a good stream for cod and perch. When a school boy at Castlemaine I frequently spent my holidays at Newstead, on the Loddon, and occasionally caught a five or six pounder – but the fish have grown much bigger since those far off days.

Argus, 16 January 1920
Loss of Fish. "During a recent fresh in the Loddon," writes B.E.C., "many dead fish, cod and perch, were noticed floating in the water. Local anglers attribute the mortality to mud in the water, but others think some alkali must have got in. The fish seem to be all right now, and cod up to 15lb. are being taken."

Clunes Guardian, 31 August 1920
Early Clunes (By –"Fidelis")
The creek at that time (1851) was a crystal clear stream abounding in good fish, blackfish, catfish and cod. I remember seeing a 7 or 8 pound cod caught near Blake's weir, which was about half way between the Service Street and Government bridges

Argus, 22 December 1924
Mr. Walker, farmer, on the Loddon near Newbridge landed a Murray cod which weighed 11lb. Other fishermen have been successful in obtaining nice catches of cod, perch, and blackfish.

Argus, 18 March, 1927
Laanecoorie. Many hundredweights of fish, including Murray cod, bream, perch, tench, and trout, were caught when the weir at the Loddon River was completed on Wednesday. Many people were present, and great excitement prevailed. Some large fish were landed, including one of 38lb. Mr. J. J. Weaner, who was on an electioneering tour, happened to be on the spot, and expressed disapproval at the action of the Water Commission in letting all the water run away.

Clunes Guardian & Gazette, 19 April 1930
Early Times of Clunes (by Early Bird)
Anything touching the early history of Clunes will appeal to a large number of visitors, and that which follows has been, to a certain extent, unfolded to me by one who was here in the fifties. / It was all bush, with a beautiful stream (Tullaroop Creek) running through it, and dividing where the Butter Factory now stands, one stream ran round the foot of the hill and again joined the main stream a few hundred yards further down. There were Murray cod, bream and other fish in the stream.

Maryborough Advertiser, 19 November 1930
Supply of Macquarie perch available – Mr. C. P. Wild, Secretary of the Angling Club, had a telegram on Saturday from Mr. Lewis (Inspector of Fisheries), stating that it was anticipated there would be a supply of Macquarie perch available at an early date and asking the number required. Mr. Wild promptly wired back ordering 700. Yesterday he received advice that 200 contained in 24 cans would arrive in Maryborough Station at 5.25 this evening. Arrangements have been made to release them in the Deep Creek.

16.6 Loddon River Catchment Oral Histories

The following oral histories (OH 139-146) mostly discuss the Loddon River Catchment.

OH 139

Ron Mudford of Eaglehawk was interviewed in August 2007 at an age of 85 Years.

I am 85 years old was born in Kyneton, grew up at Malmsbury. I saw my dad catch a cod behind Kaplin's in the Loddon, that's the headwaters there, the closest town would be Castlemaine, it was upstream from Guildford. It would have been about 5 pound; it was a big fish for there it was only a small stream. That was when I was about 8, he got it on a worm and it's the only one I saw there. After that they dynamited it and they disappeared in the river. In there, well there was also Galaxias a little minnow, and Blackfish. The Blackfish were sweet to eat.

Down in the Loddon there was a spot where my father used to fish they called it the "bream hole", down near Glenluce, my dad used to get Macquarie perch there, a lot. He used to talk about the Macquaries there, my word; they were good eating and good to catch. He used to head off there from Malmsbury, walk all night and camp there to catch the Macquaries. But that was before I was out there. There was still a few caught when I went out there with him, a little grey fish, we could still catch small numbers then, I'd have been 8 to 10 when they were being caught out there, no later, but then they were gone. They were definitely there before they were stocked in 1931; my dad had been catching them a long time before. The native fish, the cod and bream, they went as far upstream as the Loddon Falls, that's the falls on the river at Glenlyon. They didn't get past them. I left the area in 1938 or so but before that we would go out there for a bit of fun. One thing he did catch out there that was most unusual was an eel, dad caught one about 6 pounds in weight an enormous eel. It shouldn't have been there it was on the wrong side but it might have crawled across the paddocks to get there.

The Campaspe, it was out of my area, but it was quite good, it had a lot of tench and redfin. The Macquarie perch they were in around Avonmore near Elmore, they were a pound, pound and a half, I'd say the biggest one was a couple of pounds. There were cod out there but they were getting scarce by then. I know that they got a few yellowbelly there, not many; I didn't catch any though I know others caught them. I'd say the Macquaries the last ones were caught at Avonmore between 40 and 50, about then. The cod they couldn't get up past Turpins Falls, not like in the Loddon where they were there in the headwaters. I didn't hear of many yellowbelly out of the Campaspe not till you got down towards the Murray down to Echuca. And the same in the Loddon there was no yellowbelly in the top of it, but there were a few grunters down from Serpentine. The biggest cod I caught came out of the Murray it was 73 pound from Woolpooroola, that's about 12 miles west of Echuca.

OH 140

Ron Dalmenico of Castlemaine was interviewed in August 2007.

We had relatives that had the pub at Guildford. My father's nickname was Kap; my father was born and bred at Yandoit, and moved to Guildford. He showed me the 'cod hole' when I was 5 or 6 years old. It was going out towards Bond Springs; I remember that, it was probably the 30s or a bit before when they were catching the cod. I do remember they called it the cod hole and they were big fish they were catching. And other fish well they always had redfin, yellowbellies, Catfish and tench out there, and an abundance of water rats.

OH 141

Ian McDonald of Castlemaine was interviewed in August 2007 and is married to Arlene, daughter of Jack Delmenico who was the publican at Guildford.

I'm 74. I don't know exactly how long ago it was, about 40 years ago, I seen them in the back of Jack Delmenico's Holden ute. There was 3 cod between 30 and 33 pounds; they were caught on springers put in the

night before. Laurie Passalaqua got one as well. They stopped fishing for them as the inspectors were after them. That was out of the cod hole, between Vaughan and Guildford. Since then the hole has silted up. They used to get plenty of redfin out there. Many years ago at Glenluce I knew a bloke who caught a cod there that was 7 ½ pound. I was told years ago there was a lot of cod around up there, you could go and get a lot quick, but that was a long time ago. Up at Glenluce they used to get a lot of Blackfish up there, but not further down at Guildford.

OH 142

Frank Passalaqua of Guildford was interviewed in January 2008 at an age of 84 years.

I was born in Guildford, the 21st of September 1924. My father, Alfred Percy was born in 1896. Dad was a butcher; he'd go up the river fishing with his kids. I took up trout fishing with Ray Bower and Charles Purches, never really fished for cod except when I was a kid. My first memory of cod in the Loddon was in approximately 1936. One evening my brother, myself and Bill Jukes were fishing in the Loddon River in Guildford at Teddys Willows where we caught four Murray cod about 5 pounds each. These were caught on a willow branch about 6 feet long with a piece of chord and hook attached as we had no fishing lines in those days. Two other recognized fishermen were fishing about 15 feet from us but they never got a bite, they were Dave Carter and Maurice Dalmenico.

In the late 1930s there was a sluicing plant operating on the flat near the railway bridge and they pumped water from the Loddon River. In what was the pump hole Wally Maple caught a cod about 8 pound, about 20 yards down from where the railway bridge is in Guildford. I can remember after a flood Beryl Gill found an 8 to 10 pound Murray cod washed up on the flat below the Guildford Bridge, that would have been about 1939. In about 1940 Fred Hill caught 4 Murray cod in the Loddon River about 300 yards downstream from the junction of the Campbells Creek and the Loddon. These fish were approximately 6 pounds each and caught on a spinner. Next day my father, brother Ron and myself went down to the same hole with Fred Hill and my father caught 3 more and Fred got one, all about 6 pound. This was the last time it was fished for cod in that hole.

The stories about the 'cod hole' come from about the war time. The cod hole was known as 'Horseshoe Bend'. Approximately in the 1930s Maurrie Robinson pumped out a hole in the river about 250 yards upstream from Kemp's bridge for water for his dairy cattle on his property which adjoined the river at this spot. Finding quite a number of small cod in the pumped out hole he collected them and put them back in the river at Horse Shoe Bend, later to be known as the 'cod hole'. In late 1940 Dave Carter caught a cod in this hole about 8 pounds. It was soon known and other fishermen started fishing in this hole. About 12 cod were caught by various people including my father, the fish ranged from 6 to 8 pounds. Laurie Passalaqua got one 25 pound. Jack Delmenico got a 65 pound cod. I never seen it but the story goes that it was caught illegal and the police intervened and took the fish from him and gave it to the Castlemaine Hospital. That ended to my knowledge the cod caught in that hole. The last cod I saw was caught by Freddie Hill; I reckon it was about 1948.

Regarding redfin in the Loddon, not many good size redfin have been caught, mainly about ½ a pound to 1 pound. Although many redfin 4 inches long have been seen in the shallow waters, they never seemed to have grown. The Blackfish, I've only caught them in the Loddon at Glenluce, and Middleton's Creek, I used to go up there gold panning. Being a trout fisherman over many years fishing the Loddon from Vaughan to Newstead I believe that there is cod still in the big holes as trout are very hard to catch in these big holes and trout can be caught often in the small holes. No one over the past 20 years have fished for cod in the Loddon between Vaughan and Newstead. Who knows what cod remain in these big holes, although the Loddon has not had much water flowing since the 2000 flood. The river hasn't been good since 2000, but it used to dry up when I was a kid. But there still are some big holes in it.

OH 143

Bill Rumbolt of Boort was interviewed in March 2008 at an age of 83 years.

I'm 83 in October; I grew up at Laanecoorie, downstream of the weir. My father came from Baringhup West and my mother from Baringhup East. He used to catch cod up there. My father at Baringhup, in a diary he had a crossline in and got a nine pound cod. I can remember that my father lost a bit of his arm, just below the elbow, blasting rock for a house after a misfire, that was back before 1909. My brother was born before me, and came to Laanecoorie in 1924. We used to trap water rats for their skins, there was quite a few around, and I can remember my father saying they used to shoot koalas in the swamp near Laanecoorie.

In the Loddon there, when I was young, there was cod and redfin, and a few tench. There was lots of cod there before the forty four drought, like in those days everybody had a drum net in. The cod were pretty common, up to forty pound. I'd say about twenty pound was the average, we never caught anything that would be classed as undersized, no I never ever saw very small cod caught by anyone. My father at one time got seven in the drum net. I only ever saw one yellowbelly, at first I didn't even know what it was; I thought it was some type of strange cod. That was just before I left in the 1950s. I'd never heard of the yellowbelly till then, and I never heard of bream or Catfish at Laanecoorie. If there had been any there at that time they would have been caught with all the nets that were in. They might have been there earlier but the Fernihurst Weir could have blocked them coming up the river.

During the forty four drought they pumped out the mine water into the river to make it run for the stock. A lot of big cod died from that, the cod were common up until then. I don't know if it was the salt in the mine water, it was suitable for stock, but it killed the fish. When I was young floods were quite common in those days, and the river for some reason was clearer than nowadays. The biggest flood in memory went through here in 1887, it spread out as far as Pyramid Hill, there weren't any levee banks back in those days. I can remember still seeing the debris in the river, concrete steps, from when Laanecoorie burst. In the forties it was much like it is now, hopefully it will go back to what it was like in the fifties, maybe its just part of a natural cycle. I've seen a few changes, I was there for thirty five years and I never saw a kangaroo, but now between there and Dunolly there are thousands.

OH 144

Robert Scholes of Bridgewater was interviewed in November 2007.

My father died last Christmas and was 86. He fished the Loddon before Cairn Curran was built. When he was a boy, he had no problems catching fish. He would simply walk down to the river at the bridge and catch cod. The way he spoke he mainly caught plate sized stuff rather than the bigger stuff. In those days there was Blackfish, yellowbelly, cod, have heard of Catfish mentioned, he never mentioned any bream. Apparently the redfin basically decimated the native species he said; there was an explosion of them. I can remember in the 1960s I'd go out with him, with two hooks, had no problems catching sixty redfin. In the early 70s there was a lot of bad water, there was a lot of dead cod and Blackfish across the big holes. There was dead cod up to a hundred pounds, both upstream and downstream of Bridgewater.

OH 145

Harold Chalmers of Kerang was interviewed in June 2008 at an age of 84 years.

I grew up on the Loddon at Canary Island, between Boort and Kerang. I'm only 84! When I was young in the Loddon there was Murray cod of course, and tench, there was always tench in the river when I was a lad. The tench you always caught them with a floater so the hook was above the bottom of the river. There wasn't any redfin around in those days, not that I can remember. There was always Blackfish; oh they were easy to catch on a line! They were very small, up to about twelve inches you'd get them on a hook and a line. The cod were common. What I was told was told was the black fellas could spear a cod any time they wanted one and they

were still quite plentiful in the early days and still common when I was young. The cod were mainly 14 to 20 pound, I remember my father taking a 44 pound cod in the Loddon, that was the biggest I saw caught.

Yellowbelly, there wasn't many in my youth days, I don't recall catching any when I was young though I think odd ones were caught. We always had to go out to the Murray or the Edward to catch yellowbellies. There were grunters in the river, not very common; they seemed to like the deep water. They were a great fishing fish; they'd tear off as fast as they could. There was Catfish, they were quite common, they were next to cod in numbers, very good eating, very tasty meat on them. They were an ugly fish but a good sports fish, we got them up to 3 to 4 pound, they liked to eat the worms. The Trout cod they're protected in the Murray, you can't take one. I don't think there was any in the Loddon, I never saw one. The reports I got from the other fishermen was that they were more common up near Albury and up into the mountain streams, that's where they talked about them. I've never heard of a Macquarie perch out of this part of the Loddon. There was a lot of the native carp around. I remember when we went to school at Canary Island and one day we had an excursion along the river and we found a log in the river. There was a dozen native carp in it. The redfin, there was a lot of redfin in the lakes in the 1940s and 50s, but back when I was a lad I don't remember catching any in the river.

The cod were common but unfortunately there was a goldmine near the river up towards Bendigo and it poured cyanide into the river. There was thousands of dead cod; the river was white with the cod turned upside down. It spoilt the fishing for years and years. I can't remember exactly when it was I was very young; it might have been about 1933. The Loddon River is absolutely dry at the moment. When I was a kid there was always water in the waterholes, but since 1996 it's been as dry as a bone. In the 1940s I remember walking across the Murray up at Euston, the Murray was only a gutter.

OH 146

Mick Ashton of Kerang was interviewed in November 2006 at an age of 77 years.

My father was a ganger on the shire tramway from Kerang to Koondrook. When I was 9 or 10 years old I remember the big cod that he got sitting on our veranda, it was 124 pound. I sat in front of it with my boots in its mouth, I will never forget it! He was the ganger on the tramway, used to set off in the mornings and meet his mate from the other end. One morning from the tramway bridge they saw this big bow wave coming up the Barr Creek. It was this big cod; it swam up and lay in the shade under the bridge. It used to go out at night and hunt for food and come back in the morning to the shade under the bridge. Well to start with they tried to catch it on bait. They set a big yabby up on a line, and it would come out and smell it, but it then went back to the shade. They tried every bait but it did just the same thing. Well they decided next morning that they would try to shoot it. The bloke from the other end brought a shotgun. My father borrowed a 303 from the rifle club and they waited for it. Eventually they saw the bow wave coming up the creek and just before it got to the bridge the other bloke couldn't fire the shotgun as the cod was down too deep. My father was waiting on the other side and when it stuck its head out he plugged it right between the eyes. They hooked it out with a pole and took it up to the butter factory where it was weighed. It was put on the train to Melbourne and it sold for sixpence a pound.

The Loddon River, when I was 7 or 8 years old, we used to camp on it. It was clear, you would drink it, now it is just a mud hole, you wouldn't think about it. Further down, below where the Pyramid Creek comes in, it's a bit better, but nothing like it used to be. In the river and in the Barr Creek there were Catfish, cod, yellowbelly, grunter, redfin and tench. In the Barr Creek, well in the 1930s it was just the best creek, it was sensational! There was any amount of cod in the creek. My father used to troll with an aeroplane spinner, with the line wrapped around his knee. Once he got dragged out of the boat by a cod, but he made it back. The other fish in the area, well there were yellowbelly; they were common, up to 10 to 12 pounds. The bream were pretty common, if you got a big one they would go on your line, they were excellent to catch. We caught them up to 4

to 5 pound; it was no trouble to get one that size. When you got them out onto the bank they would grunt. They were not a good eating fish. We used to go out to the Wakool, out through Murrabit, and we used to catch a lot of greasies in that river. A long time ago we used to catch quite a few, but all of them were small, none of them would have been over a foot long. Over 50 years ago my father told me there was a second type of cod, the Trout cod, in the Kerang area. I've never seen one in the area, though they are common now up towards Yarrawonga way. Apparently they had always been very scarce in the Kerang area, never common in the rivers here, that's what I was told. And the Macquarie perch, no one ever talked about seeing one around here.

The Catfish were very common; they were commonly around 3 to 4 pound, with the biggest ones around 5 to 6 pounds. We used to go down to the Barr creek on a Saturday morning, my father, brothers and I, with a sugarbag each and a bamboo pole with a hook on the end. We used to walk along and you used to see the Catfish sleeping on their sides against the bank. We would hook them out and fill the sugarbags, have them on the train to Melbourne that morning. I would have been 8 to 10 years old at the time. A few years later the Catfish became scarce throughout the area, you never saw them in the same numbers, not many. Years later they turned the Barr Creek into a channel, well that broke your heart, when you knew what it used to be like. I used to love the redfin, but can't find them now, though they still catch them in Lake Charm. I can remember when they were thick around here, in all the lakes and rivers around. The biggest was about 7 pound, while the average big one was 3 to 4 pound. There was a pro chap here who used to gill net the big ones. I used to get them on the bobbers and the hogback spinners. I used to go out to Reedy Lake using the hogback spinners and find the holes in the reeds. I would throw it out 3 times into a hole and if I didn't catch anything I would move onto another hole. I once got 23 redfin in 23 casts in Racecourse Lake, real good fish. I cleaned them and then went home for lunch. I went back after lunch and I caught none, they had moved on.

Out through Murrabit the Wakool was always good for yellowbelly and redfin mainly, but more of the redfin. I used to get some good cod out there too. It was no good getting out there before 4 o'clock. There was one big hole, well every time I went out there you could throw in and fill a potato bag with redfin. I went out there one day and there was this ute pulled up, I knew the ute, the owner was a bit of a poacher. I was down the river and there was a hell of a blast, he had blown the hole. We never again caught a fish out of that hole.

17 Macquarie River Catchment

Notes on a Fishing Excursion to the Duckmaloi River.

At this season of the year, when fishing excursions are the order, and parties are on the look-out for a nice quiet spot to spend the holiday, with a certainty of getting good sport, let me recommend them to the following :—

It having been my lot to spend a few weeks at Oberon in carrying out a Government contract, the genial host of the Royal Hotel, Mr. Thomas Naylor, invited me to a fishing trip out to the Duckmaloi River, situated about seven or eight miles from Oberon. Having accepted the invite, at 2.30, our genial host, his right-hand man Bill, and myself, having taken our seats with all the necessary requisites for a pleasant outing, with Captain and Charlie in their collars, we set out for our destination.

Arriving there I was at once struck with its appearnce. Our sporting friends can imagine a beautiful sheet of water with a depth of 5 to 16 feet, about 150 yards long. lined here and there with black wattle and nice little patches of green bank to fish off, with rocks bulging and here and there; and about midway a large rock jutting out into midstream, leaving a nice cove with deep water close up. We made for this rock and at once prepared to try our luck. The "boss" was first in, and almost immediately he exclaimed "I've got him!" and landed a nice little cod. Without waiting to finish my floater I lost no time in getting my line out, but but although I put on a lively worm I failed to get any return. So leaving the others in possession I shouldered my rods and some bait and went for fresh fields and pastures new. After passing several

Bathurst Free Press & Mining Journal, 24 December 1894

Notes on a Fishing Excursion to the Duckmaloi River.

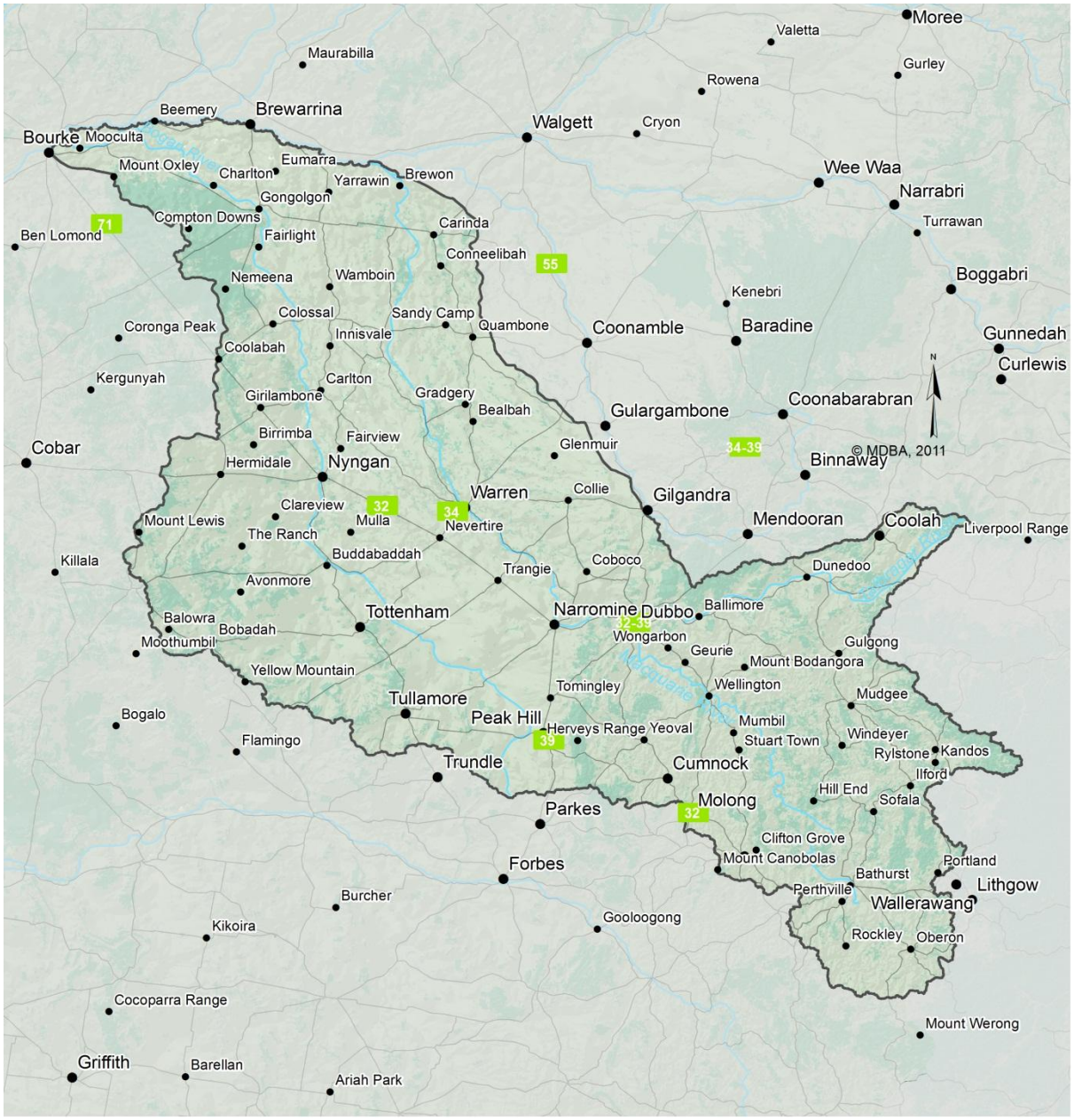
At this season of the year, when fishing excursions are the order, and parties are on the look-out for a nice quiet spot to spend the holiday, with a certainty of getting good sport, let me recommend them to the following:-

It having been my lot to spend a few weeks at Oberon in carrying out a Government contract, the genial host of the Royal Hotel, Mr. Thomas Naylor, invited me to a fishing trip out to the Duckmaloi River, situated about seven or eight miles from Oberon. Having accepted the invite, at 2.30, our genial host, his right-hand man Bill, and myself, having taken our seats with all the necessary requisites for a pleasant outing, with Captain and Charlie in their collars, we set out for our destination.

Arriving there I was at once struck with its appearnce [sic]. Our sporting friends can imagine a beautiful sheet of water with a depth of 5 to 16 feet, about 150 yards long. lined [sic] here and there with black wattle and nice little patches of green bank to fish off, with rocks bulging and a here and there; and about midway a large rock jutting out into midstream, leaving a nice cove with deep water close up. We made for this rock and at once prepared to try our luck. The "boss" was first in, and almost immediately he exclaimed "I've got him!" and landed a nice little cod. Without waiting to finish my floater I lost no time in getting my line out, but but [sic] although I put on a lively worm I failed to get any return. So leaving the others in possession I shouldered my rods and some bait and went for fresh fields and pastures new. After passing several . . .

Bathurst Free Press & Mining Journal, 24 December 1894

Figure 17.1 The Macquarie River Catchment showing major waterways and key localities



17.1 Early European Accounts

The first European account of fish in the Macquarie Catchment was recorded by George Evans in his journal in November 1813. He caught fish, thought to be cod, from the Fish River near the present site of Tarana: 'We shot ducks and caught several trout weighing at least 5 or 6 pounds each' (Mackaness, 1965). The following year a team of road builders led by William Cox returned to the Fish River and provided the first account of 'cod' in the Murray Darling Basin, recording an abundance of fish: 'They brought some fish with them, which proved to be rock cod, weighing about 5 lb. each. / During their stay they caught 10 fish, and state that had the water not run so strong they would have caught as many as they pleased' (Mackaness, 1965). Many early accounts report an abundance of cod in the Fish, Campbell and Macquarie Rivers near Bathurst and their importance as a food source to the residents:

> The Bathurst cod have been caught of the weight of seventy pounds, but those of thirty pounds weight are very common. They are a most delicious fish too, and voracious for bait; but as one of moderate size will always suffice you at a time, you have never to troll long ere you have something better than a "glorious nibble" to boast of on returning (Cunningham, 1827).

Naturalist Rene Lesson, reporting on his visit to Bathurst in 1824, provided a reliable indication of the typical size encountered of the cod captured at that time:

> est communément longue de 10 pouces, bien que nous en ayons vu des individus ayant plus de deux pieds, et ces individus pesant soixante livres, au dire de M. Morisses, gouverneur du poste militaire = it is commonly 10 inches long, although we saw individuals of them more than two feet long, and there are individuals weighing up to sixty pounds, according to the statement of Mr Morisses, governor of the military post (Lesson, 1830).

The cod were also present in the smaller streams such as the Evans Plains Creek, near Bathampton: 'Procured a cod-fish from a creek of the river Macquarie, which we crossed in our way, weighing nineteen pounds' (Taylor, 1823), and were common into the very headwaters of this catchment:

> There is a singular circumstance connected with these inland waters not undeserving of notice. Those flowing to the westward, or the interior of the continent, abound in a species of perch, or cod, as they are called in the colony, of which the waters flowing to the eastward are entirely destitute; and the ultimate direction of any stream of unknown destination found winding along the trackless ravines of the intervening mountains, can be determined with the utmost certainty from this circumstance" (Lang, 1852).

Early in Bathurst's history a second type of fish known as 'perch' or 'bream' was reported as being commonly caught in the local rivers:

> we proceeded to a settler's farm at O'Connell plains, also on the Fish river (1½ miles) / Here the fish bit readily. They consist both in the Fish river and in the Macquarie, into which it runs, of only two kinds,—one a fresh-water tasted, perch-like fish, and the other more cod-like, and sometimes growing to the size of twenty pounds weight (Taylor, 1823).

The identity of the 'perch', now known as Macquarie perch, was revealed by Rene Lesson, who captured and ate examples he caught from the Macquarie River at Bathurst in 1824. He named the species *Macquaria australasia*, returning one small specimen to France and publishing a colour illustration of the species (Lesson, 1825; 1826). Thomas Hobbes Scott (Thomas 'Hobbescote' in the French records) forwarded two examples to

France for examination by Baron Georges Cuvier who implied a common origin for the three specimens he possessed and confirmed that the holotype came from Bathurst:

> Mais MM. Lesson et Garnot nous apprennent que l'espèce arrive à une grande taille. Sa chair est très-délicate. Elle se prend à Bathurst, ville nouvellement fondée sur la rivière Maquarie, à cent cinquate milles de son embouchure. = But Messrs Lesson and Garnot teach us that the species arrives at a big size. Its flesh is very-delicate. It is caught in Bathurst, city lately founded on the Macquarie river (Cuvier & Valenciennes, 1830).

Other accounts clearly demonstrate that the 'perch' was abundant in the rivers of the upper Macquarie in the early years: 'The large cod and bream (as they are called) of the waters falling westerly, which by reason of their voracious nature are easily taken by the angler' (Cunningham, 1825). They, along with the cod, clearly provided a reliable food source for the first European settlers:

> our breakfast-table was never without beefsteaks, roast wild duck, fried bream and potatoes, besides the more usual accompaniments of pancakes, eggs, cream, and bread superior to any out of Sydney. The bream is caught in all the rivers, bites very fast, and is nearly as large as the salt-water fish of the same name caught on the coast. The cod is the most remarkable fish at Bathurst, and it is not unfrequently caught as heavy as fifty, sixty, and even ninety pounds ; when caught in large quantities, they are generally dried, and may be seen in this state hanging up inside the roofs of the settlers' houses (Campbell et al., 1828).

In 1818 John Oxley led an expedition along the Macquarie River to Wellington Valley, located on the Bell River. Prior to his departure, he recorded the capture a new species of fish, clearly being the first European account of the Catfish. As his camp was located on the Bell River it was most likely captured from that water:

> A new species of fish was caught, having four smellers above and four under the mouth; the hind part of it resembled an eel, it had one dorsal fin, and four other fins, with a white belly; it measured twenty-one inches and a half, and weighed about two pounds three quarters" (Oxley, 1820).

In 1828 Charles Sturt explored the lower Macquarie River and, near the present site of Trangie, recorded the capture of fish by the local indigenous people including 'Seven fine bream' (Sturt, 1833). Although the 'bream' cannot be identified with certainty, they were probably Silver perch.

Lawrence Struilby recorded the fishing practices of the local Wiradjuri aborigines in the late 1830s at Baroo Narang Station on the Macquarie River, located between Bathurst and the Turon River. During a canoe trip down the river to a corroboree he wrote:

> We found the blacks in high preparation to "catch munge" – fish. Dick had been acting, with dancing and grimace, the pantomime of the opossum fastening on Ash's head. They were on the bank beneath a great stringy bark tree, not mending, but making their nets. This is always done by the gins, when they are present. We were interested in the process. One with his wammerah raised off a strip of bark, which he pulled upwards till he brought down its fibre twenty or thirty feet long. He handed it to another, who twisted it along his thigh with a roll of his palm; and gave it to the next, who finished the twisting; and the others looped it into a strong and close net. When finished, it was put on a hoop of wattle sapling, and formed a crescent drag-net. This again was tied on a long pole of currywang wattle, and with it they dragged several little bays and nooks in the river, and pulled out lots of small fresh-water cod, or Peel's perch, for breakfast. They also got a kind of fresh-water muscle which they eat; but we did not fancy it (Graham, 1863).

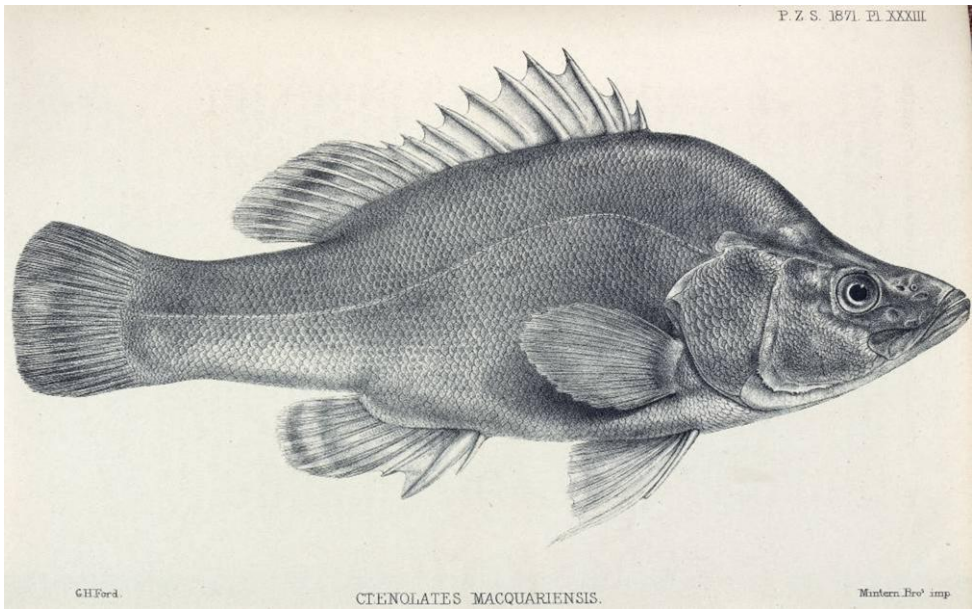
Naturalist George Bennet described the fishing practices of aboriginal people in the Fish River near Bathurst (Bennett, 1834). He later reported the stranding of a giant Murray cod in the Cudgegong River during a severe drought: 'January 12th, 1836. An enormous head of the River codfish of the Colonists. This fish was found entangled and struggling near the bank in a pond of the Cudjegong River, was killed and brought on shore. It weighed upwards of 120 lbs' (Bennett, 1864). John Hood wrote of dining on cod taken from the Bell River in December 1841: 'fish was on table, a luxury seldom known in the bush; it was a kind of cod, caught in the Bell River, and very like, in shape, the salt water cod-fish; its taste was excellent' (Hood, 1853). Further upstream substantial numbers of native fish were present at Molong with a large flood stranding fish in 1858 (*Sydney Morning Herald*, 23 March 1858) Apart from cod the Bell River held other species of large fish. The report on the Intercolonial Exhibition held in 1870 recorded that *Macquaria australasica* were found in the Bell River (NSW, 1871).

The discovery of gold by Edward Hargraves in the Lewis Ponds Creek at Ophir near Bathurst in 1851 precipitated a rush of prospectors to the region, including the Turon River. Samuel Wright wrote how, in 1852, the lower Turon had 'waterholes, unpolluted as yet by mud, abounded in fish, perch and cod' (Wright, 1916). In the nearby Macquarie River cod were so abundant that one miner in the 1870s constructed a boat and 'made a good living fishing on a commercial basis' on the Macquarie River near Hill End (Hodge, 1973). There were also significant fish stocks in the Maroo or Merindee Creek at Worlds End, a prospector writing 'There are some magnificent waterholes in the creek teeming with fish' (*Sydney Morning Herald,* 11 July 1851).

Photograph 17.1 Cuvier's Macquarie Perch

In 1830 Baron Georges Cuvier published a formal description for the Macquarie perch, *Macquaria australasica*, along with this colour illustration, based on a specimen collected by Rene Lesson at Bathurst in 1824. Two other specimens held in France collected by Thomas Hobbe Scott around the same time may have come from the Macquarie and they were recorded in 1870 in the Bell River. Image reproduced from the *Histoire naturelle des poisons*, 1830, with the permission of the *State Library of Victoria.*

Photograph 17.2 Gunther's Golden Perch



In 1871 Albert Gunther of the British Museum described a new species of fish a specimen of which he received from an undisclosed location on the Macquarie River. Naming the species *Ctenolates macquariensis* his report represented the first confirmed account of golden perch in the Macquarie Catchment. However, John Richardson subsequent to the voyage of the *Erebus* and *Terror* had described the species in 1846, mistakenly from Western Australia, and so Gunther's name was not valid. Reproduced from *The Proceedings of the Zoological Society of London,* with the permission of the *State Library of Victoria.*

17.2 The Past Distribution of Fishes in the Macquarie River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the Macquarie Catchment into a lowland zone (downstream from Gin Gin), a slopes zone (upstream to Long Point and Gulgong), an upland zone (upstream to Bathurst and Rylstone) and a montane zone beyond the latter locations. The original physical form of the Macquarie River, from Long Point as far downstream as the top of Burrendong Dam, flowed through a highly confined valley without a significant flood plain. It warrants to be treated as upland habitat downstream to that point. In the Cudgegong River the river is confined as far downstream as Mudgee where the valley widens, representing the commencement of slopes habitat. The upland zone is treated here as extending downstream to Mudgee and the top of Burrendong Dam. Below Narromine the river has the characteristics of a typical lowland river, being of low gradient and effectively unconfined. The lowland zone is treated here as being downstream of Narromine. These amendments to the *Sustainable Rivers Audit* habitat zones have been used in the following discussion.

Much of the information presented below comes from quite a number of detailed written accounts of native fish populations in this catchment from the nineteenth and early twentieth century. It is supported by oral history from senior residents recalling both their own experiences, and stories told to them by past generations (mainly OH 1-21) and some early detailed newspaper accounts. Very few old photographs of catches of native fish in this catchment have been located. A number of illustrations of fish created by early naturalists survive as well as some important museum specimens.

17.2.1 The Montane Zone

There is conclusive evidence of three native fish species being present in the montane zone at the time of European settlement: Trout cod, Macquarie perch and Blackfish. The holotypes for Trout cod and Macquarie perch were collected by Lesson from the Macquarie River at Bathurst in February 1824 (Lesson, 1825). The holotypes still exist and their origin is recorded in a number of detailed accounts from that time (Lesson 1825, 1828; Cuvier & Valenciennes 1829, 1830).

Cod were very common to abundant in some montane waters, notably the Fish and Macquarie Rivers. Ten cod were caught by William Cox's work gang who stated that they could have 'caught as many as they pleased' (Mackaness, 1965). The cod penetrated to the headwaters of the catchment (Lang, 1852) including the Mt. David area (Hanrahan, OH 25), and were very common in the Duckmaloi River seven to eight miles from Oberon (*Bathurst Free Press & Mining Journal,* 24 December 1894). The only concrete evidence of which species of cod was present is the Trout cod holotype. Two specimens recorded as *Maccullochella macquariensis* by the *Australian Museum* from the Fish River in 1882 no longer survive (*Australian Museum* database). Occasional captures of Murray cod take place in some montane waters, notably in the upper Cudgegong River, but the species has been stocked and there is no conclusive evidence of their original presence in the montane zone. An account of very large cod up to 90 lb. (40.9 kg) near Bathurst (Campbell et al., 1828), suggests that Murray cod were present. One description of a cod being green and yellow, suggests it could have been a Murray cod (*Bathurst Free Press & Mining Journal,* 24 December 1894). First-hand accounts of Trout cod being formerly common in the upland zone (Thompson, OH 13; Burns, OH 14), second hand oral history of them being common upstream of Bathurst (Smith; OH 1), combined with evidence of Trout cod being prevalent in the upper Lachlan and Murrumbidgee Rivers suggests that many of the reported cod captures near Bathurst and upstream were probably Trout cod with Murray cod also regularly taken.

The 'perch' or 'bream', reported captured near Bathurst in early accounts, were almost certainly Macquarie perch. The holotype and first-hand oral history (Maher, OH 5; Sawell, OH 7; Haskins, OH 8) confirms the species existence in the montane zone and is supported by a news story specifically recording Macquarie perch being caught by Oberon Anglers (*Sydney Morning Herald,* 14 March 1908). The other 'bream' of the western rivers, Silver perch, may also have been caught, but there is no conclusive evidence of their presence. Like cod, Macquarie perch penetrated to the very headwaters of the system near Oberon in the Duckmaloi River and the Campbells River near Mt. David (Maher, OH 5; Hanrahan, OH 25). An early account describes the "bream" as being very reliably caught (Campbell *et al*., 1828). Newspaper stories record that the Fish River was 'full of perch' (*Sydney Morning Herald,* 27 November 1909), listing several catches of half a dozen "bream" from the same water (*Sydney Morning Herald,* 18 December 1909) and combined with the oral counts suggests that Macquarie perch had been very common to abundant. Blackfish were recorded as being present in the Fish River and museum specimens were sourced from the Cudgegong River near Rylstone (Ogilby, 1913). More recent oral accounts indicate that they were once fairly abundant in the upper Cudgegong River (Haskins, OH 8) and the Macquarie River, near Bathurst (Inward, OH 16).

Golden perch, and probably Silver perch, were present in small numbers in the montane zone. There is a second hand account of Golden perch in the Fish River (Sawell, OH 7) and John Lake (1959) suggested they had been present in the Campbells River in the 1920s. He also stated that 540 Golden perch from the Murray River were translocated to Chifley Dam. Occasional captures from montane habitat in the Cudgegong River are confirmed as having occurred prior to stockings (Robbins, OH 12). Silver perch have not been reliably recorded from the montane zone, but were reported to be common in the upland zone (Thompson, OH 13) and probably had a minor presence further upstream. Catfish have been reported from just downstream of Bathurst (Burrow, OH 11) and were regularly taken, and nests observed near Rylstone in the Cudgegong River

(Robbins, OH 12). One was recently captured from the Fish River (Stock, OH 6). The evidence suggests that Catfish had a significant permanent presence in the rivers of the montane zone.

17.2.2 The Upland Zone

A notable feature of the Macquarie River is 'The Forge', a rocky gorge with a small waterfall located about half way between Bathurst and Hill End. This obstacle is a substantial barrier to upstream fish movement, passage around it being available only during very large floods. There is evidence that it influenced the distribution of native fish in the upper Macquarie River. In 1889 it was reported that there were 'five distinct varieties' of fish that could be taken below 'The Forge' including 'cod, perch and bream' but only two above (*Bathurst Free Press & Mining Journal,* 31 December 1889). As most of the upland habitat in the Macquarie River is downstream of 'The Forge' the discussion below focuses on that reach of river.

First-hand accounts, combined with the oral history of local families (Thompson, OH 13; Burns, OH 14; Uren, OH 15; Inward, OH 16) and a number of early written accounts, indicate that Murray cod, Trout cod, Macquarie perch, Silver perch, Catfish and Blackfish were formerly common to abundant in the upland zone. In the Macquarie River cod were caught in numbers by indigenous people using nets (Graham, 1863) and near Hill End supported an early commercial fishery (Hodge, 1973). One fishing party took 200 lb. (90.1 kg) of cod ranging from two to twenty lb. (0.9 to 9 kg) in three days at 'The Forge' (*National Advocate,* 9 February 1907) and a photograph records a large catch of cod taken at Long Point in 1955 (MAC1). Herb Thompson, the oldest resident at Hill End, provided a very good description of Trout cod and easily identified the species in photographs. In the 1930s both cod species were very common, though Trout cod were more prevalent than Murray cod near Hill End in both the Macquarie and Turon Rivers (Thompson, OH 13). Supporting first-hand accounts indicate that as late as the 1950s Trout cod were common in the Macquarie River (Burns, OH 14) and present in the Crudine and Ophir Creeks (Burns, OH 14; Uren, OH 15). Trout cod were also present in the Pyramul Creek (Thompson, OH 13). Cod are reported to have undertaken migrations into the upland zone with local opinion being that Trout cod were largely resident, and Murray cod migratory (*National Advocate*, 13 January 1925; Thompson, OH 13; Burns, OH 14).

First-hand oral accounts exist of "white eye" or Macquarie perch having been common in a number of upland waters, including the Macquarie and Turon Rivers (Thompson, OH 13; Auld, OH 4), and present in the Ophir Creek (Uren, OH 15). Silver perch were very common captures in the upland zone near Hill End and reported as far upstream as 'The Forge' (Thompson, OH 13; Burns, OH 14). They do not appear to have reached Kandos in the Cudgegong River (Robbins, OH 12). The oral history suggests that Golden perch were caught sporadically in the upland zone (Robbins, OH 12; Thompson, OH 13; Burns, OH 14) with increased captures after major flood events (Thompson, OH 13; Burns, OH 14). Catfish are described as having once been present and fairly common to abundant in the upland rivers (Thompson, OH 13; Burns, OH 14) with descriptions of nests being present (Thompson, OH 13; Robbins, OH 12). Roughley reported that Catfish had been "abundant" in the Cudgegong River and Lawsons Creek near Mudgee around 1900 (Roughley, 1951). Oral history recalls that Blackfish were common in some upland rivers and creeks (Thompson, OH 13; Lee, OH 17). Roughley described the species as having been "prolific" in the Cudgegong River and Lawsons Creek, near Mudgee around 1900 (Roughley, 1951), and Ogilby (1913) also observed that in some upland waters Blackfish had been abundant, directly referring to the towns of Guntawang, Mudgee and Cudgegong.

17.2.3 The Slopes Zone

Native fish were originally abundant in the slopes zone. Early accounts describe an 'inexhaustible supply' of 'cod, perch, and bream' (*Sydney Morning Herald*, 9 December 1859) and over a tonne of cod was retrieved at

one location near Wellington during a fish kill (NSW Fisheries, 1907). Bill Inward stated that Trout cod were regularly captured near Wellington until the 1920s, but were rare after that time (Inward, OH 16). Ian Parks reported his grandfather catching Trout cod in the Ponto area (Parks, OH 19) and there were occasional past captures near Narromine (Jones, OH 21). The *Australian Museum* records *Maccullochella macquariensis* from Dubbo in 1887 and Wellington in 1883, 1885 and 1934. Only the 1934 specimens from Wellington still exist. The museum supplied a photo of these specimens to the author and they appear to be Murray cod. Physical examination is required to confirm their identity. The limited evidence, from oral history, suggest that Trout cod were rare at the bottom of the slopes zone, regularly taken in the mid slopes zone and common by the upland zone. Murray cod were abundant in the early years, frequently taken up to 50 lb. (*Sydney Morning Herald*, 9 December 1859) and supported a significant commercial fishery (NSW Fisheries, 1898; 1908).

Macquarie perch were regular captures in the Macquarie River near Burrendong and very common in the lower Cudgegong River and the Maroo Creek until the 1930s (Inward, OH 16). They have also been recorded from the Bell River (NSW, 1871). Silver perch were reported to have been common to abundant near Burrendong (Inward, OH 16; Lee, OH 17) and the oral history is supported by a number of photos including large captures during the 1950s (MAC2-5). They were also abundant in the Narromine area (Astell, OH 20). Golden perch were regularly taken near Wellington (Inward, OH 16; Lee, OH 17; Photos MAC2-3) but were not considered to be as abundant as Silver perch (Inward, OH 16). Towards the bottom of the slopes zone, near Narromine, Golden perch were taken at times in good numbers and were very common to abundant (Astell, OH 20; Jones, OH 21). Oral accounts indicate that Catfish were commonly taken in the Wellington area (Inward, OH 16; Lee, OH 17) and are present in a number of photographs (MAC2-4). Further downstream at Narromine Catfish were abundant with one catch of 99 fish being taken one night (Astell, OH 20). Blackfish were historically common both in the rivers and larger creeks in the slopes zone near Wellington (Inward, OH 16; Ryan, OH 18; Lee, OH 17). Ogilby (1893) reported Blackfish being present and spawning in the Bell River.

17.2.4 The Lowland Zone

In the Macquarie River, downstream of Narromine, the oral history reports that Murray cod, Golden perch, Silver perch and Catfish were formerly abundant (Astell, OH 20; Jones, OH 21). All four were also present in lagoons, with Catfish being prevalent (Astell, OH 20). The historical evidence, while very limited, suggests that Trout cod were rare in the lowland zone and Macquarie perch very rare. Ken Jones reported captures of Trout cod near Narromine prior to the species being stocked and that elderly anglers near Warren had occasionally caught Trout cod in the past, but they had never been common (Jones, OH 21). Frank Astell did not recall Macquarie perch being taken near Narromine (Astell, OH 20). However, former resident Eugene Sharp recalled that occasional Macquarie perch were captured near Warren in the early 1950s. Sharpe has provided a reasonably good physical description, indicating that the account may be correct (Eugene Sharpe, pers. com.). There are no records of Blackfish from the lowland zone, though Ogilby (1913) reported them to have been common in lagoons at Walgett just upstream from the confluence of the Macquarie and Barwon Rivers. This suggests that they had been common in lagoon habitat along the lower Macquarie and probably present in the river itself.

17.2.5 Estimates of Native Fish Abundance in the Macquarie River Catchment at European Settlement.

Presented are the rarity scores used in the Sustainable Rivers Audit (Davies et al., 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts**.**

Table 17.1 Macquarie River Catchment Rarity Scores

	Lowland* (downstream from Narromine)		**Slopes*** (Mudgee to Narromine)		**Upland*** (Bathurst to Burrendong; Rylstone to Mudgee)		**Montane** (upstream of Bathurst and Rylstone)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA†**	**True Tales**
Trout cod	0	L1	1	L3	3	**5**		L5
Murray cod	3	**5**	5	**5**	3	**L5**		L3
Golden perch	5	**5**	5	**3**	3	**U1**		L1
Silver perch	3	**5**	3	**5**	1	**U3**		L1
Macquarie perch	0	L1	3	**3**	5	**5**		**L5**
Catfish	5	**5**	5	**5**	3	**U3**		U1
'Blackfish'	0	L1	3	**5**	5	**5**		L5

Key

0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type supported by multiple accounts or lines of evidence e.g. oral history, newspaper accounts, photographs

* Note: The boundaries used for this zone differ slightly from those used in the *Sustainable Rivers Audit*
† Rarity scores have not been previously determined for this zone in the *Sustainable Rivers Audit.*

Figure 17.2 Historical Records for Murray cod and Trout cod in the Macquarie River Catchment

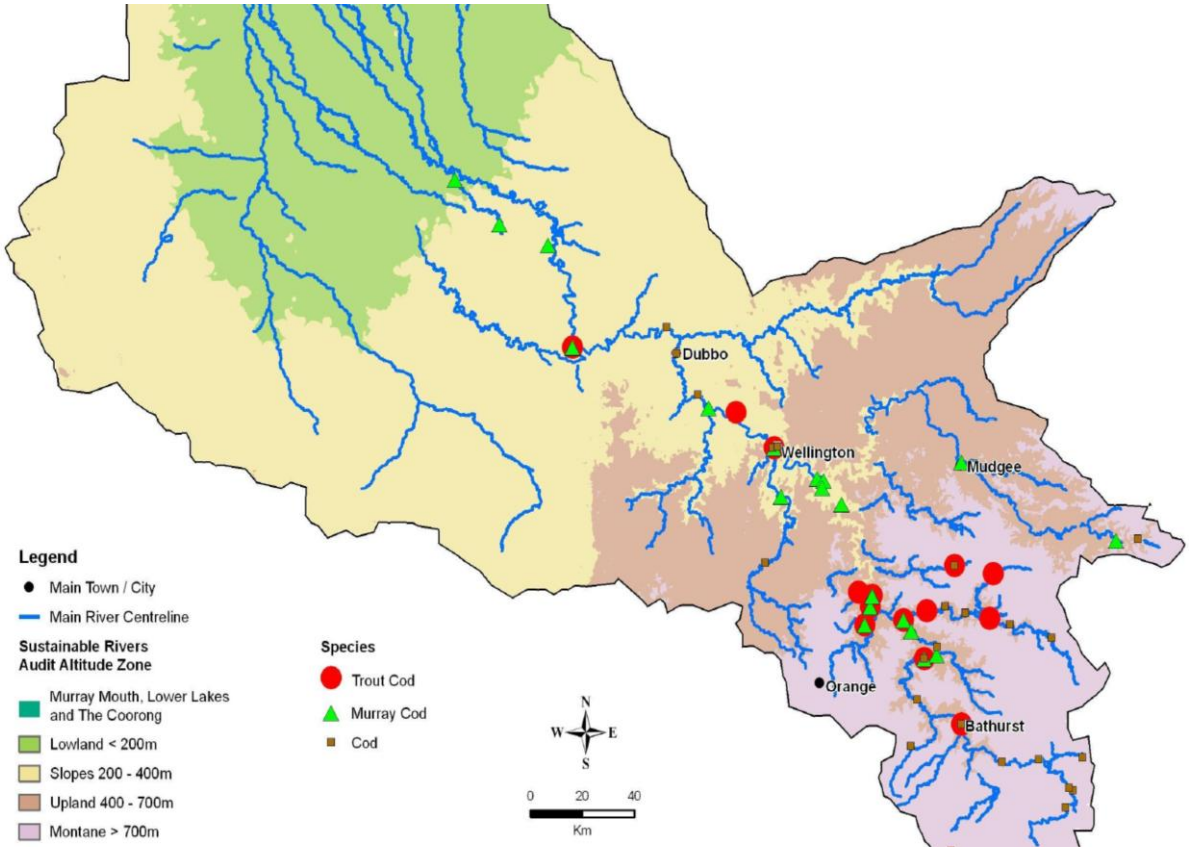
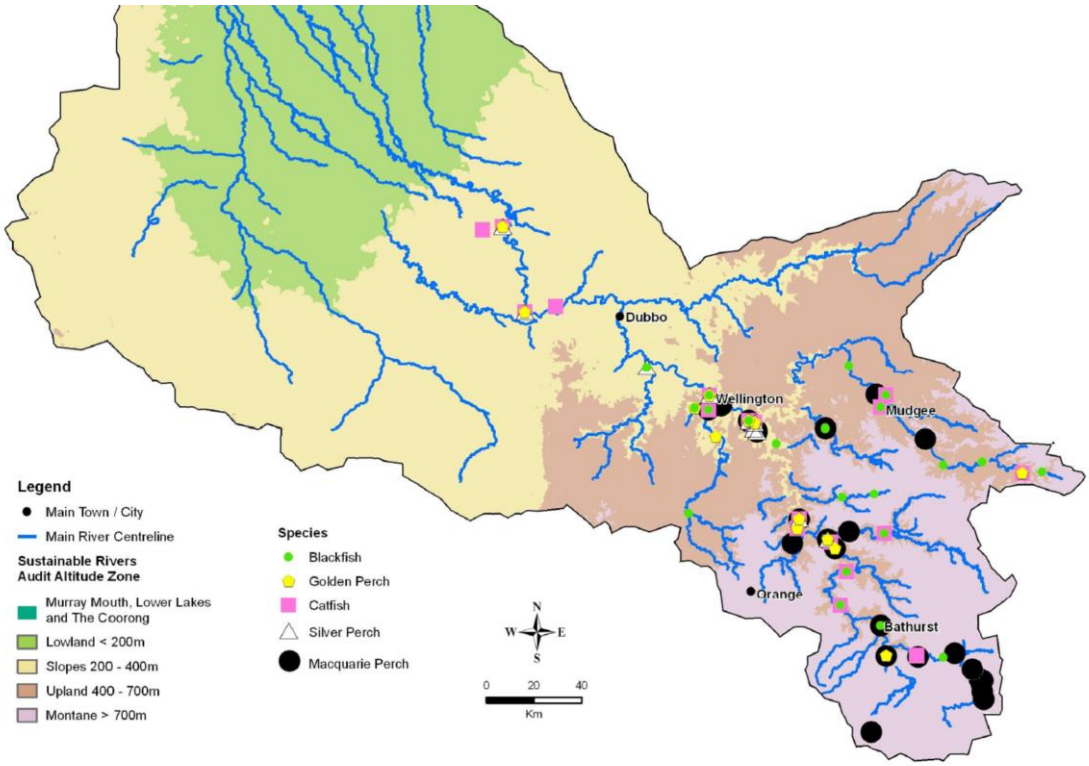


Figure 17.3 Historical Records for Native Fish Species other than Cod in the Macquarie River Catchment.



Photograph 17.3 'The Forge'

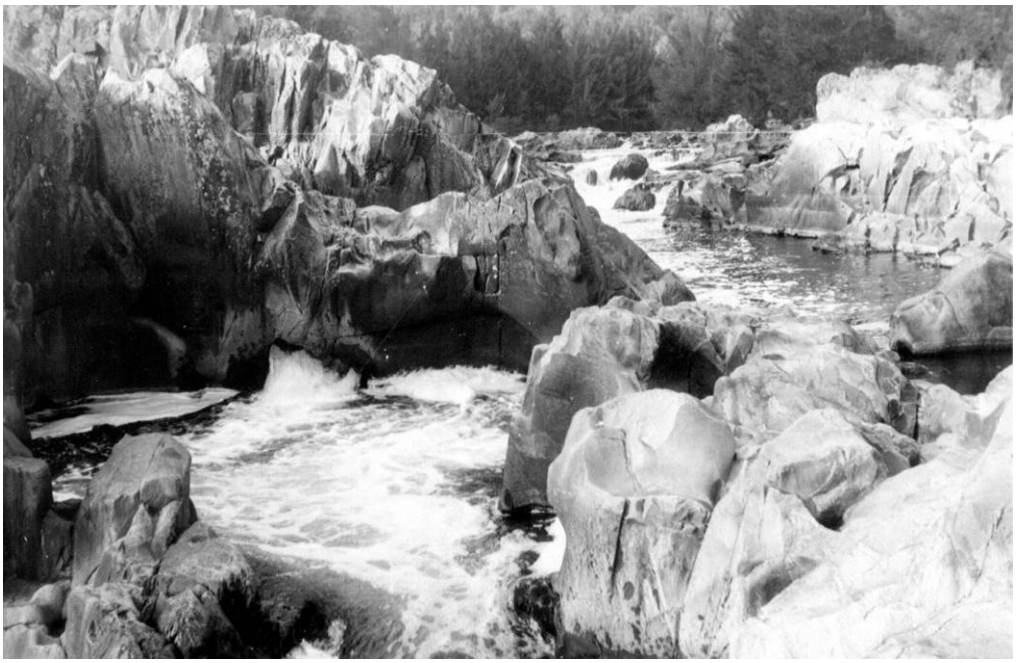


Photo MAC7. 'The Forge', a major obstacle to fish movement on the Macquarie River between Bathurst and Hill End photographed c1890. By the 1920's populations of larger native fish species had largely retreated to downstream of this barrier. Attempts to improve fish passage by blasting rock in 1922 proved unsuccessful. Photo from the collection of Fred Howarth, courtesy of Jim Buchan.

Photograph 17.4 Long Point Cod

Photo MAC1. The Burns family with a morning's catch of cod from the Macquarie River near Long Point c1955. The catch was reported to include both Murray cod and Trout cod. While the type of cod cannot be confirmed the image does demonstrate that cod were very common at the time. Photo courtesy of Rick Burns.

Photograph 17.5 Wellington Cod

These cod specimens, recorded as *Maccullochella macquariensis,* were collected at Wellington in 1934, presumably from the Macquarie River, and preserved at the *Australian Museum*. From the markings and body morphology they appear to be Murray cod. Detailed examination is required to confirm their identity. Photo copyright of the *Australian Museum*.

Photograph 17.6 Burrendong Catch

Photo MAC2. Bruce Lee (left) and Jimmy Zeia with a catch of fish from the Macquarie River taken in the 'Black Mountain Hole' at the present site of the Burrendong Dam wall c1946. The catch includes Murray cod, Golden perch, Silver perch and a Catfish. Photo courtesy of Bruce Lee.

17.3 The Changes

17.3.1 Changes to Native Fish Distribution and Abundance

In the montane zone the cod population had been depleted at Bathurst by the 1850s and were being sourced from Wellington and Forbes to meet the town's needs for fish (*Sydney Morning Herald,* 28 September 1858; 23 September 1874). Regular captures, including juvenile fish, continued in the Fish River up to the First World War (*Sydney Morning Herald*, 18 December 1909), but by the 1920s cod were very rare in montane habitats (Maher, OH 5; Robbins, OH 12). Macquarie perch were captured regularly from the Fish and Duckmaloi Rivers up to the 1940s, with the last captures occurring during the 1950s (*Sydney Morning Herald,* 18 December 1909; Maher, OH 5; Haskins, OH 8; Stock, OH 6; Sawell, OH 7). Blackfish were caught near Bathurst around 1930 (Inward, OH 16) but were absent in the Duckmaloi and Fish Rivers shortly after that time (Maher, OH 5; Haskins, OH 8). Upstream of Rylstone Blackfish were abundant during the 1930s but had dramatically declined by the 1980s (Robbins, OH 12).

In the upland zone the oral history records that by the 1930s the fishery near Hill End had significantly declined but was still considered to be reasonably good (Thompson, OH 13; Burns, OH 14). By that time cod had become scarce in the Macquarie River, upstream of 'The Forge' (Burrow, OH 11; Jim Buchan, pers. com.). In the Turon River native fish were scarce upstream of Sofala (Thompson, OH 13; Pearce, OH 3). Trout cod and Murray cod were fairly common in the Hill End area into the 1950s but subsequently declined (Thompson, OH 13; Burns, OH 14). The last reports of Trout cod were from the Macquarie River around 1984 and the Turon River shortly before that time (Thompson, OH 13; Uren, OH 15; Cole, OH 9). Macquarie perch also maintained a significant presence until the 1930s but had disappeared by the 1960s (Thompson, OH 13). Golden perch disappeared from the upland zone after the construction of Burrendong and Windamere Dams, suggesting that their upstream migrations were blocked (Burns, OH 14; Robbins, OH 12). Silver perch underwent a major decline by the 1950s (Burns, OH 14) but were still captured in numbers until Burrendong Dam was built (Uren, OH 15). Catfish remained common in the Macquarie River until the 1970s, then declined, but are still present (Herb Thompson, pers. com.). They were rare upstream of 'The Forge' by the 1950s (Burrow, OH 11). Blackfish disappeared from the Turon River in the 1970s and became scarce in the Pyramul Creek by the end of the drought of the early 1980s (Cole, OH 9).

In the slopes zone the decline in the Trout cod population transpired earlier than at Hill End with the species having virtually disappeared by the 1930s (Inward, OH 16). Macquarie perch had vanished by the end of the Second World War (Inward, OH 16) though two fairly recent unconfirmed captures from the lower Cudgegong River and the Macquarie River near Wellington suggests that a relic population might persist (Ian Parks, pers. com.). In the rivers and creeks of the slopes zone, Blackfish progressively declined after the 1930s and had disappeared from the Macquarie River by the 1970s (Inward, OH 16). While there is evidence of earlier population declines (Inward, OH 16; Ryan, OH 18) Murray cod, Golden perch, Silver perch and Catfish became scarce in the Macquarie River after the construction of Burrendong Dam in 1967 (Ryan, OH 18; Bruce Lee, pers. com.)

In the lowland zone Murray cod, Golden perch, Silver perch and Catfish were fairly common to abundant until the 1970s when a noticeable decline in catches occurred (Frank Astell and Ken Jones, pers. com.)

17.3.2 Changes to Habitat

Siltation generated by alluvial mining and the ringbarking of trees for agriculture had destroyed many of the holes in the Turon and Macquarie River gorges by the end of the nineteenth century (Hodge, 1973). Large

quantities of fish were killed during a flood at Molong in 1858 (*Sydney Morning Herald*, 23 March 1858) and in 1865 massive fish kills, stated to be on scale never seen previously by indigenous people, are reported to have decimated the fish population of the Macquarie River (*Deniliquin Pastoral Times*, 9 September 1865). In 1907 a "freshet" appears to have killed or caused serious distress to large numbers of cod (NSW Fisheries, 1907). Large fish kills near Hill End in the early 1980s, associated with drought, decimated the cod population in the Macquarie River (John Uren, Rick Burns and Ken Smith, pers. com.) and Trout cod were not taken after that time.

Goldfish and Tench were introduced to the Macquarie River at Bathurst during the early 1880s and had become prolific in that area by 1885 (*Sydney Morning Herald,* 6 January 1885). They were introduced to a lagoon near Dubbo in 1886 and in 1889 stocked from that source into the nearby Macquarie River (*Argus,* 23 March 1889). Brown trout were introduced to the Duckmaloi and Fish Rivers during the early 1890s and by 1905 were prolific in those waters (NSW Fisheries, 1900). Their introduction was associated with a decline in cod and perch populations (*Sydney Morning Herald,* 31 October 1905; Maher, OH 5). Redfin perch first appeared and proliferated during the 1970s after their introduction to Burrendong Dam (Inward, OH 16) and became common below the dam in the Wellington area (Lee, OH 17). European carp appeared in Burrendong Dam during the late 1970s and their appearance was associated with a decline in Catfish populations (Inward and Burns, pers. com.). Murray crayfish were introduced to the catchment in 1919 (NSW Fisheries, 1919; 1920; 1923; 1925) and unsuccessful attempts were made to introduce Australian Bass (NSW Fisheries Reports, 1910-13; 1916).

The first impoundment constructed was Oberon Dam on the Fish River Creek in 1949, followed by Chifley Dam on the Campbell River in 1956. Burrendong Dam was constructed in 1967 and is suggested to have caused declines in upstream populations of Golden perch and Silver perch (Burns, OH 14; Uren, OH 15). Cold water released from the dam has depressed summer temperatures immediately downstream by 10-11°C compared to that of the Macquarie River upstream near Long Point. The temperature regime of the river has been altered for as much as 300 km downstream making conditions less suitable for native fish (Sherman, 2000).

17.4 The Current Situation

The *Sustainable Rivers Audit* concluded that:

> the Macquarie Valley fish community was in Very Poor Condition, with the Upland Zone community in Extremely Poor Condition. Alien species were most of the biomass and abundance. The community had lost most of its native species and was dominated by alien fish (Davies *et al*., 2008).

It is clear that a major loss of biodiversity in the upland and montane zones has transpired, with the extinction of two species that were once prolific in these areas being Trout cod and Macquarie perch. Blackfish are now scarce and while upland populations of Murray cod and Golden perch exist, they are supported by extensive stocking into Burrendong and Windamere Dams. Downstream of Burrendong Dam significant populations of Murray cod, Golden perch, Silver perch and Catfish still exist.

During the early 1990s small numbers of Trout cod fingerlings were liberated in the Hill End area but, while a small number of fish were subsequently caught, failed to establish a population. In 2010 a more extensive stocking program commenced in the Macquarie River between Bathurst and Burrendong Dam to attempt to re-introduce Trout cod to the upland zone. A stocking program has established a population of Trout cod between Wellington and Warren though it is unknown whether it is self-supporting.

17.5 Newspaper Highlights

Sydney Morning Herald, 23 March 1858
Although there was no rain in the township of Molong at the period of the late flood, the creek was higher than it had been known to be for fifteen years previously. Great quantities of fish were washed upon the flats adjoining the banks of the creek

Sydney Morning Herald, 28 September 1858
Fish:—The season now becoming advanced, many of the Macquarie cod-fish have been brought into town, and proved a very acceptable addition to the table. Some years ago several parties made a very good living by regularly catching these fish in the season, and bringing them into Bathurst for sale. Further down the river, towards Wellington and Dubbo, they can be caught in abundance.

Sydney Morning Herald, 9 December 1859
Wellington. / A great quantity of fish, comprising the cod, perch, and bream have been caught during the last four months, from the Macquarie River, and from the apparently inexhaustible supply to be obtained there, for a distance of 200 miles, it is a wonder that some party does not enter into a speculation, to erect weirs, set nets, and otherwise establish methods of taking fish of sufficient size to salt and cure for the colonial market; tons and tons annually are consumed in the different towns, which the price at which it is usually sold (a shilling per lb.) would leave a good margin to both the procurer and vendor. The blacks camping along the river during three-parts of the year obtain plenty of fish, ranging in weight up to 30, 40, and 50lbs. / As proof of the immense weight that the cod attains in the Macquarie River, some few years ago I may mention that Mr. W. Curtis, of Wellington, landed one at the Commissioner's Fall here, close to the township, that weight 99lbs. Four months ago at Gobolion a bullock-driver caught one that weighed 52 lbs. Mr, A, Cruickshank, of Murrumbidgee station, captured there about the same time a cod, weighing 55 lbs., and unable in consequence of securing a retreat.

Sydney Morning Herald, 6 May 1871
Last Tuesday week, a codfish weighing over 36 lbs. was caught by Mr. John Piper, of Stoney Creek, near Bathurst.

Sydney Morning Herald, 6 June 1885
Bathurst, Monday. / There is wholesale destruction of fish in the Macquarie River. Numbers of persons are using nets to catch the fish, principally carp and tench, which are taken in quantities. The large ones are carried off, and the smaller ones left to rot on the banks. These fish were put in the river two or three years ago, and have increased with wonderful rapidity.

Bathurst Times, 4 October 1887
A Successful Fishing Excursion—Mssrs W. Hansard, H. Ford and Butler had a "good time" at the Forge yesterday, wither they had gone on an "eight hours" fishing excursion. They caught 60 lbs. weight of cod, and other fish, and six of them weighed 33½ lbs., among them being a 12 pounder who is now undergoing the process of boiling

Bathurst Times, 20 March 1895
A Large Cod Fish – Mr. J. Piper, the veteran of the Macquarie river about, brought into town an enormous cod fish weighing 40 lbs. He caught it at the Forge with a strong line, which he had procured on purpose, knowing that there was a large cod thereabouts. He judged this from the fact that lines had been broken on previous

occasions. The fish, which is much thicker and heavier than a shark of the same length (about 4 ft.), was exhibited at Whelan's Commercial Hotel, and was curiously examined by many who had not seen such a monster since the days of poor George Saville. It may be mentioned that recently Mr. Keane, a great enthusiast with the line, and a party went to the Willows, a place on the Macquarie 26 miles from Bathurst, and caught 72 lbs of splendid fish.

Sydney Morning Herald, 31 October 1905
The Duckmaloi Trout. / The Duckmaloi was stocked some years ago with trout fry by the late Police sergeant-major Lawrence, whose widow, now aged over 70, can tell many tales of the stirring times when bushrangers terrorised the country-side. / There are no carp in the Duckmaloi, but other streams in the district, and particularly the Fish River and Creek, have plenty of them. / Three years ago Mr. R. Yates, of Tarana, caught a 5lb trout. "Trout," says one old angler, "will eat anything but the log fences hereabout. They have cleaned out the bream, the cod, and the carp, but we will not mind that if they stay themselves."

National Advocate, 9 February 1907
Macquarie Cod
As a result of a few days visit to The Forge, Macquarie River, at the end of last week and the beginning of this, Messrs Samuel Davis and Frank Carey caught about 140 lbs of Macquarie cod, comprising specimens ranging from 2 lbs. up to 30 lbs. Hauls made by other parties at about the same time brings the total up to nearly 200 lbs.

Sydney Morning Herald, 27 November 1909
Trout-fishing is being carried out daily by plenty of fly-fishers throughout the State. Tarana and Oberon are being well fished, and the two best trout caught recently were a 4½ and a 3 pounder at Oberon, which gave their captor, Mr. Poole, great fights. Mr. S. Cunynghame caught two perch weighing 4lb in the Fish River, which is full of perch, notwithstanding the presence of trout also.

Sydney Morning Herald, 18 December 1909
Angling. / Oberon and Tarana fishing is up to the usual summer mark. Recent catches in this mountain district are as follows: – Mr. Sperring, 12lb weight of cod, near Limestone: Mr. J. Grady, a 4 lb trout, in the Fish River near the Duckmaloi Post-office: Messrs. G. Nunan and V. Bourke, four trout up to 2lb weight and six bream up to 2lb weight, near Hampton Crossing. Mr. Scammell caught an eight-pounder and a seven-pounder near the junction, as well as several cod up to 1½lb weight: Mr. T. Nunan caught four trout ranging from 1½lb to 2½lb weight; Miss A. Grady caught three nice trout, and Mr. D. Galvin six large bream at another favourite locality.

Bathurst Times, 4 April 1922
'THE FORGE' WORK
Bathurst fishermen who frequent 'The Forge' are delighted with the work carried out by Mr. H. Chick in widening the channel considerable which enters into the Pot Hole. Previously the opening was extremely narrow and it was the census of opinion amongst good judges that if the fish were able to come nearer to Bathurst a much greater opening was imperative. The work has now been completed to the satisfaction of practically all anglers. At present the fish cannot pass the Pot Hole owing to the water being too low but as soon as the fresh occurs they should experience no difficulty in accomplishing the hitherto impossible task.

National Advocate, 13 January 1925
Can You Beat It?
Speaking to an 'Advocate' reporter last night Mr. P. Hansard, of Russell Street, who has just returned after a fishing expedition at the Forge on the Macquarie, made some interesting remarks in regard to the fishing this year.

Whilst on the excursion Mr. Hansard witnessed a sight which he says he has never seen before in all his 20 years as a disciple of Isaac Walton on the Macquarie. "We were sitting on the bank of the river" said Mr. Hansard, "and we notices a couple of fairly large cod swimming upstream through a narrow channel near a sand bank. We watched for a while and presently two more fish passed the same spot, also traveling upstream. We stayed watching for over an hour and there was an almost continual procession of four or five pound cod passing the same spot. We could only come to one conclusion and that is that the fish were making a general migration up stream. It had generally been understood by fishermen in these parts that the cod travel upstream only when the river is high. Now, however, the stream is very low and the marvel is how the fish manage to get up the fords and rapids. Whilst out on this trip we met another party from lower down the river and they informed us that they also had seen the fish traveling up stream in large numbers. There is a great deal of green weed in the river lower down and I have come to the conclusion that the fish are desirous of getting away from this."

Mr. Hansard, who was accompanied by Mssrrs J. Rigby and W. Austin, decided to give the fish every inducement to travel up the river as far as possible. With this end in view, assisted by other fishermen present, got to work with gelignite and opened up the river near the Forge at a point that was blocked with rock and other debris. He now believes that if the river rises three feet the cod will be able to come right up to Bathurst, in which case the good sport will be obtained without going any great distances.

Mr. Hansard and the other members of the party numbering about ten in all obtained splendid bags. Fishing from 4 o'clock on Saturday afternoon until 7 o'clock on Sunday morning they obtained 50 fine fish ranging from 7 lbs down. In one hole 20 splendid cod were brought out in two hours on Saturday night.

Referring again to the migration of the cod, Mr. Hansard said that he noticed that quite a number of the fish had bruises on the jaws and gills. This he put down to the fact that they used these portions of their bodies to pull themselves over the rocks and obstacles barring their progress up the river. /

National Advocate, 14 January 1925
Can You Beat It?
The blasting operations referred to under this heading in yesterday's issue were, Mr Hansard informs us, not carried out during his visit to the Forge, but was performed by Mr Ernie Ewer and done on a previous occasion some 18 months ago.

17.6 Significant Extracts from the Annual Reports on the Fisheries of NSW

1901
The emergence of fish from the bowels of the earth is almost as rare a phenomenon. The following case happened on Mr. J. A. Buckland's station at Pine Ridge, Gulgong…A pump, worked by an engine was fixed, and as it became choked with fish the auger was removed, and a 2-inch pipe substituted. Fish and crustaceans continued to come up, and some of the fish which have been supplied by Mr. Buckland have been identified as

a freshwater species (Aristeus fluviatilis). Of course the fish may have been in the well before the jet of water was let in. The nearest known watercourse to the site of the well, Talbragar Creek, a tributary of the Macquarie, is about 4 miles distant.

1907

As a result of freshets in the Macquarie River in February, the water became so discoloured that large numbers of big cod became affected and were easily captured near the banks and in the shallow waters. It was reported that over a ton weight of fish was secured in this manner, within a distance of 3 miles, near Wellington, several of which weighed over 30 lb.

1910-13

Three very large consignments of Australian bass – Australia's finest indigenous sporting fish, and one of the best edible fishes – have been planted in the Cudgegong River, near Gulgong, 750 being placed in the "school hole" at Birigambil and the remainder in lagoons on the course of the river at Eumaralla Station (late Guntawang).

1916

A portion of the Cudgegong river upwards to its source from the main traffic bridge at Mudgee was closed against the use of fishing nets and fishing lines, other than a single rod and line, or a hand-line, for ten years from the 1st February, 1912, in order to protect the Australian Bass liberated there. Numerous inquiries were made of local residents, and all reported that no record was available of a single Australian bass being seen since liberation. It appears that shortly after the fish were liberated a heavy storm brought a thick muddy rise down the Cudgegong River, and apparently either destroyed the Bass, or they travelled down stream with it and do not have appeared to return.

17.7 Macquarie River Catchment Oral Histories

The following oral histories (OH 1-21) mostly discuss the Macquarie Catchment.

OH 1
Ken Smith of Bathurst was interviewed in July 2006.
I was told how in the early days there were cod and black bream in the Fish River. In the Macquarie River down at 'the Forge' there was a rock barrier, below that they used to catch Murray cod but not above. Up above they only caught a different type of cod. The oral history of the area is that what they now call the Trout cod were all through the upper reaches and headwaters of the Macquarie as well as the Macquarie perch. Some of the stories talk about the cod being trapped in the holes during mining sluicing operations. The last Blackfish were in the Oberon region but the floods and fires wiped them out.

OH 2
Peter Byrom of Oberon was interviewed in March 2007.
I live on the Fish River. All the people used to talk about the bream with the tiny mouths, nobody called them Macquarie perch. The Fish River went up to the Fish River Creek and the Duckmaloi. My great uncle said there was two types of cod down in the river, the long ones were caught up to 25 pound, that was the biggest ever caught, down in 'The Forge' area. A good one was 10 to 12 pounds, the average was 3 to 4 pound. Some of the cod were 'travellers', they had sores on them. I have contacted one old gentleman of 82 called Ken Maher and have got a good account of the river from 1928 on. He tells a story of his dad out shooting rabbits along the river, when checking his old mare he walked over to her and was amazed at a massive fish in the rapids as long as a fence post rolling around in the water. When it seen him it thrashed around in the river until it reached the deep water. Ken said his dad regretted many times over the years that he didn't shoot the fish but he was shocked at the size of the fish. His dad said it was more than likely a codfish. The black bream in the river were Macquarie bream; they were as black as your boot and grew to about 5 to 6 pounds.

OH 3
Henry Pearce of Upper Turon provided these comments in March 2007 at an age of 55 years.
About the cod here, in my father's day there were a few cod, but all we have here now are the browns. All I've known is two cod here in my lifetime, on the Turon. In my time there's only been trout and now the carp. Further down the river there's always been cod

OH 4
Bob Auld of Hill End provided these comments in March 2007 at an age of 60 years.
I caught the black bream, Macquarie perch, when I was a kid down at Dixon's at Long Point. Used to get them between Hill End and Orange, when I was 8 to 10 years old.

OH 5
Ken Maher of Hazelgrove was interviewed in August 2007 at an age of 83 years.
I'm 83, grew up about here, down Braelennie down the Tarana Road from here, then moved out to Hazelgrove. We were down there on the river for 5 years then went to Braelennie. That is the Fish River. There was trout there, an odd cod and the bream, that was about when I was 5 years old. The bream were the best fish ever to eat, a black fish with a snowy white flesh. That's the Macquarie perch though everybody called them bream actually. They were very quiet on the line, if you didn't get them straight out the water rats ate them. You'd get them up to 3 to 4 pound, maybe a bit bigger. I haven't seen one or caught one for 50 years. I only ever heard of them in the Fish River and down further in the Macquarie. I know they went as far back as the Duckmaloi Road at least that far. We got them on worms any time of the year, in season, out of season, mostly at night and in

the evening. There was the old goldfish around, he was no use for anything, only bones. Plenty of them in the river. Never saw slimies.

The cod actually I never saw one in the river. I have heard my grandparents talk about all the cod in the river a long time ago and the trout killed them out. But back then there was plenty around, oh yeah. That's the Hawkens; they were my mother's parents. There was plenty of cod in the river. At one time dad was shooting along the river, had the shotgun over his shoulder, he was coming up the river and he heard a big splash. He saw a fish as long as a fence post, that's what he related it to, he was mesmerized by it. He saw it flip into the deep water, it was only then he thought about the gun on his shoulder but it was too late then.

OH 6

David Stock was interviewed in November 2007 at an age of 74 years.

I'm 74, live just outside Oberon. Well, on the fish in the past, Mick O'Connell just died in the last eighteen months; he lived down at the junction of the Duckmaloi and the Fish River. He told me he could go down and catch a lot of trout or a bream on a worm, back in the 40's and 50's. As far as I understand they were Macquarie perch. Some unusual fish have turned up. Billy Sawell caught an eight or nine inch Catfish at O'Connell's at the flat a while back.

OH 7

Bill Sawell was interviewed in November 2007 at an age of 79 years.

I'm 79, live in Edith, right on the Duckmaloi. I got into the Oberon district about 1948, 49. Back in the 1950s I worked at Mick O'Connell's, digging spuds. In the 50's there was still a few bream around, they were in a hole on Tom Richard's place. They had a guesthouse right on the river; the guests would come and have a fish. I fished that river all them years ago, there was plenty of trout, you could catch as many as you wanted. The bream, most of them were about a pound, pound and a half was the biggest of them, and that's what the local blokes said too. I never caught many, I usually threw them back, but I just ate one to try one. Apparently they caught quite a lot of bream there in the 30's and 40's. Mick O'Connell had been on the river all his life, he lived to 94. He said that there had been cod, some yellowbelly and the bream at the junction of the Duckmaloi and the Fish River, back in the early 1900s, up to the 1920s.

OH 8

Jeff Haskins was interviewed in November 2007 at an age of 85 years.

Oh, I'm too old to tell you! Actually 85. We came up here in 1939; father bought the place on the Duckmaloi, where you go to Sydney after you cross the river you see 'Clear Hills' on the gate. 'Clear Hills', that was the name, there were all these holes about a metre wide and a metre deep dug by the miners, but they didn't find much gold. There was a gold mine just east of our place. I think we had five miles of river. There was a trout hatchery on a hole in Hatchery Creek, part of Bindo Creek, at the second crossing. In the river then were the browns and the rainbows, trout, then there was some, I suppose, a native, we used to call them the freshwater bream. Where did we catch them? Oh well, where our house was on the river there was a big pond in the river, there was quite a lot of them, we used to trap them. They were usually about a pound, up to fifteen to sixteen inches long, they were very hard to catch on a rod. We made traps, actually we had a piggery down there, and we'd put the traps in, in the evening and take them out in the morning. We never really caught them on a line. They were good to eat, terrific. We sold the place about fifteen years ago and they had gone before then.

There was another fish, I called them slipperies, but I never saw them in the Duckmaloi. I used to catch them, used to go over on the other side of the road from Clear Hills, there's a place called 'Ringwood'. It was in the headwaters of the Jenolan River. In the top there, you'd go in there a mile or two, there were springs and then there was a pool with a waterfall. Below the waterfall there was a few there, below the waterfall. I think they

were all the way down to the Jenolan Caves; it was near the very top of the dividing range. How big were they? Oh, not very big, about ten to twelve inches, a bit more. As far as I can remember they were a greeny, slimy colour, they didn't have any red on them like the trout. That was back in the 1940s and 50s. I don't think anybody put them out there; there was no one that lived out there.

OH 9

Brendan Cole of Turondale was interviewed in November 2007 at an age of 57 years.

I'm 57, grew up in Turondale, lived just on the northern side, a property on the Turon. My family, they come to Sofala in the 1850s. I heard all the stories about the fish mostly from me dad when we went fishing, he was born in 1908, and with the uncles. In the early days in the Turon they caught cod and the slipperies, they didn't talk much about yellowbelly in the Turon, they got a few of them out at the Randwick Hole in the Macquarie. Before I was born they used to fish the Randwick and they caught cod and yellowbelly there. I don't have any recollection of dad talking of Macquarie perch. Dad had caught the silver bream or Silver perch in other places, but not in the Turon, he used to call them bream. He did catch them out in the Darling when I was seven years old, but not around the Bathurst area.

We used to catch cod out of the Turon in the 60s and 70s, I caught some of them with him. We used to go down there overnight when I was in my teens. I remember my dad catching a 20 pounder, a Murray cod, and I caught a cod that was 12 pound that was a bit different. It was a bit longer in the head, I reckon I was about 18; I caught it on a lure. We talked about it a lot, during the 80's when we heard about the two types of cod. From what I heard the cod originally went up the Turon to Upper Turon, in the bigger waterholes, and the Crudine Creek had cod in it. There was Catfish caught then in the Turon, and at 'The Marbles' in the 70's, and the last slipperies were caught out of it at the same time. In my time the Blackfish, there was a lot of Blackfish in the Pyramul Creek, then they died out, I can't be sure of any being caught after the 82 drought. Mum and dad told me that the Turon was so dry in the 40's that they had to dig for water for the stock. Dad did say at one stage that there was a long period of time when there was no fish in the Turon.

OH 10

John Hadley of Bathurst was interviewed in December 2007 at an age of 52 years.

I'm 52, grew up here at Bathurst. My grandfather, he really pioneered the place, he came from out around Forbes, Parkes way. He used to tell all these stories about the fishing, how he built the old hut down at 'The Forge', used to call it the old 'Flat Hole'. He said the cod had disappeared, that all they used to catch was Catfish, and all of a sudden the cod came back. He was a fairly quiet man, so it was a big thing to say. My father, he used to live down there, every weekend, and all he caught was cod for fifty odd years, just cod, cod, cod. He only used one rod, no lines or setlines. The average he used to catch and keep was about 40 pound, back then 10 pounders were as easy as anything. Even now, last year you'd catch 10 and 20 pounders. The bait was grubs, crayfish. My grandfather down at Stony Creek, about 5 km down from 'The Forge' got a 48 pounder there.

OH 11

Shirley Burrow of Broadwater near Bathurst was interviewed in February 2008.

Many, many years ago they caught cod here. There was some perch, and a Blackfish, that was about it, from the old timers. Back in the fifties I know they caught at least one cod, my father caught one. And the perch well my father said you would get one in a blue moon. There was the odd Catfish about too. He died in the 1960s and the trout was the main thing he caught during his life. By the time they upgraded Chifley Dam that's all they ever caught.

In Kings Creek here there was the gudgeon, there's still gudgeon in the creek, they survived here because there was a few springs. Back in the forties we'd go to the creek to have a bath and the gudgeon were there, they've always been in the creek and the river. There's also trout, there was plenty about when they put the fingerlings in years ago, but I haven't heard of any for a while. Back in the forties they had to sink holes in the sand to find water in the river, that's how bad the drought was then. And there was a dreadful drought they talked about in the 1890s.

With this river there are some big holes in the river with rapids in between, at Broadwater, Walters, Billywillinga. In the fifties we could go to the river and it was clean, it had big Oak trees and no blackberries. The eighty six flood that went through here was the highest on record; it piled logs thirty feet up the river into the creeks. It was so strong that when the flood came down the young oak trees were snapped out. The river has a lot of sand in it, but the holes are still there, but it does need water to flush out the sand.

OH 12

Doug Robbins of Kandos was interviewed in November 2007 at an age of 75 years.

The Cudgegong here, there used to be a lot of cod in it, a long, long time ago, and the slipperies, the Blackfish, there was a lot of them. About 60 odd years ago they used to get the cod, get them up where the water supply is, the Kandos Weir. I'm 75 now, I've fished it since I was a kid I was born here and my father was here. He used to tell me about all the cod up there when they were building the weir. There was a lot of big holes and cool water. That would be ninety years ago. We used to take him out fishing up there; he used to point out all the holes where they used to get the cod. Years ago up there I heard of them caught up to 40 pound. I caught one there about 20 years ago, it was 5 ½ pound, that was an original fish, before any stocking. There weren't any spinners around in those days; we just used a rod and line. The rod was an old Hickory stick or wattle and a cork for a float. We got the fish mainly on worms, the cod, all of them.

There was also a lot of the lobsters up there, the crays, in the early days they were great big ones, they're still there. There was a few yellowbelly up there too. There was a bloke got one about 16 pound, not by fishing, it was caught up in a fence, that's a long time before there was any stocking, so it got up there itself. There was a lot of catties there, and there's still some there. We used to catch mainly catties in the finish, and mainly Blackfish. The Catfish you'd get them up to 3 to 4 pound. I've seen their nests many years ago there, they would have them full of rocks and you could see the catties. The nests have been seen lately, where it's sandy and pebbly not far from the bank. The grunter I have seem them in the Barwon, there used to be a lot of them out there, but they've disappeared. But not in the Cudgegong, I've never seen one up here.

The Blackfish we used to catch 20 or thirty, no worries then they disappeared. I know one place below the wall, you would catch a hundred of them, but I haven't seen one there for fifteen to twenty years. There was piggery up there and stuff got washed in. After that the slipperies disappeared. To eat, I prefer the cod. The Catfish they were pretty good too. Years ago we used to get odd slipperies up to eighteen to twenty inches long; the average one was eight to ten inches long. If they grew bigger they would have been terrific. It was a shame to see all the fish die out. Since they put Dunns Swamp on 'Getaway', it now gets five or six hundred people fishing it, it's now heavily fished. Even though they've stocked it they're taking them all out undersize.

OH 13

Herb Thompson of Hill End was interviewed in October 2007 at an age of 84 years.

I'm 84. I grew up in Hill End, so did my father, mother and my grandfather. When I was young in the Macquarie River was the cod, the yellowbelly, Catfish and the little slipperies. The Macquarie perch were here, my father called them a white eye, they were called something else, but I can't remember, but they were a bream. There was also the silver bream and the carp, but not the European carp back then. The Macquarie bream were a bit

different to the ones we get now, I've got one of them, a silver bream, now in my freezer. I'm sure they had rounded tails, and big eyes, weren't as silvery and they weren't as bony as the silver bream we get now, that they've stocked in the dam. They weren't real big, up to 2 to 3 pound; the average would be a pound and a half I'd say. I caught them mostly down at the junction and in the Randwick Hole, that's in the Macquarie. They used to go up the Turon, I caught them I'd say up to Everett's, that's 5 to 6 miles up, also caught the cod there. But I caught more in the Macquarie, but they weren't as common as the cod. They were beautiful to eat. When I came back here in 1960 they had gone, when I was about 41 I seen the last of those bream. Yes, dad used to talk about the white eye, how they used to be very common and were the best of all fish to eat, he was going back to around 1900. He called them something else too; I think it was a goggle eyes bream.

We used to get two types of cod; there was the longer one and a dumpy cod which was more white and compact. The long cod, some called them the rock cod, that's what we used to call them. The head was longer and pointier, the nose kind of protruded, stuck out more over the mouth. The markings, the rock cod was more blue on the head, and sort of green on the back, and the markings was stripy looking, lots of spots and little stripes. And the Murray cod, the fat ones, the mouth sort of met, they were more white on the belly and lighter in colour. The rock cod were fairly common in the early years, about the 30's, 36-38, they were pretty common. They pulled a lot harder than the Murray cod too. They were in the Turon and were caught up as far as Sofala, there the trout took over. Old Sidey Howard and George Benda used to go out at 'the Forge' fishing, that's further up the Macquarie towards Bathurst. They caught cod there, but not above it. In the forge or just below.

I caught the rock cod up to about 30 to 40 pound, that was the biggest, the common size was from 7 to 12 pound, you seldom got a big one. The Murray cod were more plump, mostly 7 to 20 pounds, but I got them up to 75 pound cleaned, I'd say they were fewer but you saw them bigger. The rock cod used to breed up in the rocky creeks and holes. We thought the rock cod was the local cod, and that the Murray cod used to breed down the river and were caught while they were moving up the Macquarie. That was one theory. Dad, he talked about going down to the Randwick Hole and walking across, the water was about waist high. He walked through all these cod, they were all swimming upstream, but they wouldn't take the bait. He had gone down with a horse and cart to catch them. Back then I'd say we caught more rock cod than Murray cod out of the Macquarie, that's down near Burn's place near the junction with the Turon. And in the Turon they were mostly rock cod, they were the most common. The last rock cod I saw I caught in the Macquarie down near the junction with the Turon about 1983 or 84, they were scarce by then.

The yellowbelly was in the Macquarie, I caught a few myself up to 12 pound but they weren't common, and a few redfin in latter years about the 1970s. There was a lot of silver bream around in them days, when I was young, up to 5 to 6 pounders. I was away in the 40's in the army and after that working. Apparently in the 56 flood a lot of yellowbelly came up the river. My brother in law and my brother, they're both dead, but they caught a lot at the time. The slimies were very common in the Pyramul and Green Valley Creeks. The Green Valley runs into the Pyramul which runs into the Macquarie down near the dam. The cod also went up the Pyramul in fact up as far as the Little Falls. I am sure that there was rock cod in the Pyramul. I haven't seen a slimy for years; the last ones would have been about 10 years ago.

The Catfish, they used to be pretty common, it was nothing to catch a couple on dark. The biggest were 8 to 9 pound, but were common up to about 5 pound. I've seen them on their nests; they would clean them out and patrol it. I saw the nests in the Macquarie, where the Bathurst Road meets the Macquarie, above the junction of the Turon. There was one once on his nest, in the circle, and I tried for two hours to catch him. I'd drop the bait in and he would kick it out of the circle. I then tried to jag him but didn't do any good either. We used to use for bait mainly the Oak grubs, but also the carp and yabbies. And some big worms, but you could only get them in two places. But the Oak grubs were the best. You could catch the cod anytime, but mostly about

September was the best time. We wouldn't fish for them when they had the eggs. In the cod I've found platypus, in fact a couple of little ones, yabbies, the carp and stones. I'd say the cod was the best to eat; actually the rock cod was better than the Murray cod. It was more sweeter and didn't have as much oil in them. The biggest change I've seen is the water in the river. There were some real dry times in my school days, but this ones a lot worse, it's more prolonged.

OH 14

Rick Burns of Hill End was interviewed in October 2007 at an age of 66 years.

I'm 66, grew up in Hill End. My father came here from Sydney in 1929, took up land. My great grandfather was here in 1870, struck it rich in the gold rush. He set up a business in Sydney and must have talked about Hill End so my father came out here. My great grandfather was dead before I was born. My father talked about here during the 30's and 40's. They were particularly dry years, like it is now. The holes silted up, rabbit droppings were washed in, he doubted that anything could live in it the way it was. In the 50's the floods flushed the river out, the fish came back, well some did. There was mostly cod and the odd yellowbelly. Catfish were fairly common. The bream were rare by the 1950s; they called them the silver bream. They've since stocked them in the dam, that's Burrendong, and they sometimes move up out of the dam into the river. The slipperies were in the creeks leading into the Macquarie, like the Pyramul Creek, and they are still there.

Back in the 40's three rabbiters were rabbiting and they got a good cod, over 30 pound, probably got it on a bit of rabbit. Well they decided to cook it and eat it there and then; it would have been a big meal between the 4 of them. Back in the gold rush there was a commercial fisherman here who made a living on the cod. He had a boat, all his nets and gear, he used to get them out of a big hole in the Macquarie just down here and sell the cod to the miners up on the goldfield. The old blokes from Hill End used to talk about the two types of cod. One day they were really biting, they were getting them on their setlines and bringing them up the bank putting them in a pile. You're talking about 20 to 30 fish here. They were classifying the cod like fleeces, putting them into two piles. In one pile was what they called the 'mountain cod' which were what they now call the Trout cod and in the other pile were the 'river cod' which were Murray cod. The fish would have been from about 3 to 20 pounds. The mountain cod were a bit smaller, were chubbier and had the long trouty snout.

The old blokes seemed to think that the river cod used to migrate up the river to Hill End from below where Burrendong is now while the mountain cod lived up in the mountains, up around Hill End and were caught all year round. That was well over 30 years ago when I saw those fish, but the old blokes were talking about what they had seen right back to the 20's. That was in the Macquarie just down here. In the Turon the cod went right up, and in the Crudine but its all silted up now. The old blokes used to also call the Trout cod a 'rock cod', that was another name for them. We know what they are, they released some Trout cod here and in the Ophir Creek some years ago, there was a few caught, they're the same fish. The Catfish I wouldn't say were as common as the cod, they were from a pound up to about 6 pound, and they're still here. The old blokes talked about how the yellowbelly used to push their way up the river in spring with the flooding, how they'd get a few but they weren't particularly common. After Burrendong went in they couldn't come up at all but they have been stocked in the dam. And the redfin, 20 years ago there was a fair few there, but they haven't been heard of for a while.

OH 15

John Uren of 'Yankee tom' near Hill End was interviewed in November 2007 at an age of 59 years.

I'm 59, grew up here, spent all my life here. I'm on the Macquarie, just above where the Summer Creek runs in. Me father arrived in Ophir in 1902, he come from Cobar. He talked about how they used to catch the cod, the catties and the slipperies in the Ophir Creek. They used to catch a lot of Murray cod but he also caught the Trout cod. He caught one when I was young, it was 16 to 17 pound, that was the first one I saw. He called them

a bluenose or rock cod, he pointed out the blue snout, and they were longer looking. I caught a few myself later on, in the river. I think he said he caught them up to 23, 24 pound; they weren't a very large fish. The last one I caught would be in the early 1960s, below Long Point, it was 11 pound. In 1982 I did see one that was dead in the drought, in with the Murray cod.

The Murray cod the average size me dad talked about was 7 to 8 pound, that was the common size; In March he reckoned he used to get a lot of small stuff. The best ones me dad caught were 80 to 100 pound. I've got an old photo of him with an 80 pounder in the 1930s. He used to camp at what they called the 'Little Station', its down in Burrendong, but comes out when the dam is low. He would go down there rabbiting and fishing, but he preferred the fish. He said that in summer when the river stopped running the fish there wouldn't bite. You could see the cod, but couldn't catch them. He reckoned he seen a rabbit with a bit of grass in his mouth swim across the river towards an island and bang a large cod grabbed him. H also talked about the army blowing up the Forge in the 1930s so the cod could get up the river easier, but I forget how much he said they took off it.

There used to be quite a lot of yellowbelly, they were common about 5 to 6 pound. The biggest one caught was a twenty eight pounder, would have been the mid 1960s. The yellowbelly got caught out, but they're coming back from the stocking. I can't remember him talking about the grunter. The Macquarie perch, I remember me dad catching one in the Ophir Creek, he caught it on an old chord line, about 4 miles up from the junction. I was about 7 at the time. He did talk about them, I can't remember what he said, but that was the only one I seen. The Catfish, I remember when me dad used to talk about them. You could see the nests on the sandy beaches, in some holes there were ten to fifteen nests. Me uncle always used to try to catch one, with the chord line; he dropped it in the nest. He pulled one out and the spikes went into his hand. He spent the night putting his hand in hot water.

OH 16

Bill Inward of Dubbo was interviewed in January 2008 at an age of 85 years.

I'm 85, grew up really at Mount Burrendong and Fashion Mount, on the Macquarie River, where the dam is now. My father grew up at Burrendong, he then went to the first world war, came back with 27 pieces of shrapnel in him, drew a soldiers block out near Leadville near Dunedoo, but had to throw it in and leave in the depression, about 1932. He came back to Burrendong on the properties, on Burrendong, Murphies, Kattela. He fished too, early on he said there were cod, some yellowbelly, the yellowbelly had never been very common, always a bit hard to come by. I remember what a magnificent fish the yellowbelly was, the first one I saw, very golden and very green on top with a prominent lateral line. When I was young no, not common at that stage. There was a fish, a slippery, a freshwater Blackfish, biggest I ever seen was about 16 inches long, codfish loved them. I started catching slipperies when I was 8 years old at Bathurst; that would be about 1930, in the Macquarie River. You could see their heads sticking out of the rocks; they were common you could catch them on a bent pin and a piece of bread. At Burrendong if you had one on your line periodically a cod would take it. They were common in the Curra Creek down at Wellington and in the Wuuluman Creek about 2 miles up from where the dam is. There also used to be a lot of them in the river at Maryvale, that was about the last place I saw them, in the seventies. In both those creeks you also got the gudgeon, it looked like a little Murray cod; it had purple spots down the sides. At Burrendong the Catfish were the mainstay for eating.

The white eye, there was a fish we called the white eye, a type of bream. He was found mainly in the gravelly country on the river beds, often in holes fifty to sixty yards long, not so much in the big holes. When it got clear well the big cod could see them, they were in the smaller holes. There was quite a few of them caught around the junction of the Cudgegong. Also there was the silver bream, had very fine scales and pure silver, shiny like a two bob piece, beautiful to look at and good to eat, not like the big black bream you get in the dam now. Never seen a silver bream over 2 1/4 pound out of the river back then. The white eye were not very common, not

down our way at Burrendong, more around the junction. They were up in the Cudgegong, below Mudgee, and up in the Maroo. He and the slipperies were common up there and in all the creeks in the district. In the 1930s you would quite often hear people mention the white eye in the 30's. I did a lot of fishing after I came back from the Second World War and I cannot remember ever catching one then or since. A fair size white eye was 2 to 3 pound, the average 1 ½ to 2 pounds. I believe the white eye has been caught in Wyangala. And the freshwater Catfish and yellowbelly were more common in the Cudgegong. There was a little fish, where there was an island in the river under Fashions Mount, this little fish with black and white stripes along his body, vertical stripes, only two inches long. They used to swim near the edge of the current at the island, never seen them since.

The cod when I was young, there were quite a lot of big ones. After the '26 flood they found this big cod against a fence, they cut off his head and put it on a bridge post, he was 80 to 90 pound, on the Burrendong bridge. They were common and there wasn't a lot of fisherman, there was only six or seven families in the area. Back in the 30's you would quite often get a cod, usually 8 to 10 pound. Catfish or freshwater jewfish about a pound, the biggest I saw out of the river was 7 ½, in later years bigger out of the dam. The silver bream they were in patches. There was a fine gravel hole, about 200 yards below the junction of the Cudgegong and Macquarie Rivers, that's where we caught the most. The yellowbelly were less common. The biggest yellowbelly I saw on the water up there was 4 ½ to 5 pound, that would be the biggest. After the 50 flood a mate showed me some caught near Maryvale, near Wellington 6 mile out. One was 19 pound and another 15 pound. The biggest cod, there was one weighed in at Wellington that was 119 pound.

I had the pleasure of seeing this spotted cod at Narrandera, it was a Trout cod. John Lake was there at the time at the research station, he was a terrific bloke, did wonderful work with the fish. I saw one there, they had him in a big case, he was a fairly big fish, maybe 30 to 40 pounds. I remember it so well I was very interested in it at the time, I'd never seen one before. He told me that they used to be found mainly well up the rivers, he got that first hand from the old fisherman. I can tell you the only cod I ever caught out of the Macquarie was the Murray cod, some were fat, some were thin, I am fairly sure on that. All Murray cod known as a dumpy cod and a thin cod we used to call the Macquarie cod. But they had been here. I heard the stories about them many years ago. The old blokes, the old fellas, talked that they caught what they called the Trout cod at Wellington. It was about World War One, they were regularly caught but were not common. They said that they were a very pretty fish, they said it had an undershot jaw, and spotty like a trout. Not very big, 4 to 5 pound was the general run, and I think they said they were common further up the river. Yes, I am certain that's what they said. They knew the fish and certainly talked about them. That was about World War One they caught them in Wellington. When I saw the fish at Narrandera I knew what they were talking about. I've got a friend on a property 7 to 8 miles below Wellington; I can go to a place there and fish anytime. I was out there about 3 months ago, I got a bugger about 48 centimetres long, a Trout cod; I've caught plenty since they've stocked them. They're a greedy fish; I've seen them with a crayfish hanging out its mouth and still get caught. I never saw them until they got stocked. And the crayfish, he's not native to the Macquarie, they were introduced, that's what I was told years ago. The green ones and the black ones are native but not the big ones.

The old blokes talked about the cod up in the Fish River, I was about ten, they talked about it and it was a long time ago, before the First World War, certainly. I soaked the stories up; I loved my fishing, even at that time I used to catch the slipperies on a pin. In the Little River at Terabella I heard there were slipperies and the grunter bream. In the Bell River back then there was mainly trout, quite a bit, up around Molong, where the Molong Creek comes in. In later years when it flooded up at Neurea they would get a few cod and also yellowbelly. Nowadays it's overloaded with Euro carp up to twenty pound and also they're in Burrendong up to twenty pound. We also went up to 'the Forge' fishing, up there with my father, I caught my first slippery up there, they were very common up there. My father caught an 18 pound cod in that hole, the repatriation people had sent

him up there. There was a 10 foot fall and on the rock face they sometimes found cod stranded. It's hard to believe that the cod would jump up onto it. Maybe they came down the river. The billabongs, well there really weren't any from The Forge down to past Warren, really nothing permanent until you got to the marshes. Maurie Kimbell and I, we were spin merchants. The biggest cod was 82 pound; we got that about 8 mile down the river from Wellington. We once caught four cod 82, 72, 34 and 15 pound, there was four of us. There was a pool of water and this little pool had small carp in it, so we scooped four carp out, the original carp, and used them for bait. A cod on each carp. Before the dam went in there were a few fishermen, but not that many. There was an old Dutchman and he'd got out in his boat and go at 10 knots trolling the cod in the dam. He'd catch the cod and sell them, there was always cod in his fridge, and had big ones. There was three holes of water that held some very big fish at Burrendong.

The changes to the river, well long ago it was dredged. The dredges were for gold, back around 1910, they were below Burrendong, Fashions Mount. Below where the mountain falls into the river, that was number two. Number one was in front of Black Mountain. There was another one around Major Murphy's near where the low level bridge is. It got dredged early on. And one at Mackerwar called Driseois, the buckets are still there. Siltation, well upstream of the dam I can't say that there has been any change in my lifetime, it hasn't changed much. And redfin, that's my nickname! It would be after the dam was built that caught one. Maurie and I were the first people at Wellington to use flatfish. At that stage they were in the dam. The story goes somebody put in crosslines and used them for bait. They are a bit delicate; you need an aerator to keep them alive. Apparently they tipped the rest in, that's how they got in. The first I caught in the dam, he was smaller than the flatfish, about six inches. They got so bad the kids would go for a swim in the dam and they would have to get out, there were schools of them biting the hairs off their legs, they were voracious.

OH 17

Bruce Lee of Wellington was interviewed in January 2008 at an age of 79 years.

I'm 79, born in Coonamble, moved over here in 1951. I caught cod, yellowbelly, Catfish, and grunter. Used to catch slipperies in the Molong Creek. Mostly I used to fish around the 'Black Mountain Hole', about a mile below where the spillway is now. Cod was the most common; I went down one afternoon, just down here, got a 30 pound cod on a grub. In the Black Mountain Hole the biggest was around the 33 pound mark, used to catch a lot around 4 to 5 pound. There was a lot of yellowbelly; you'd get them up to 5 pound. The Catfish, there was a lot. You could go down of an afternoon and you'd catch 7 or 8 catties, no longer than 12 inches long. The grunters, we used to catch a lot here once, then they went off, we used to catch heaps of them. They got scarce; they disappeared a lot when the dam went in. I've never seen or heard of the Macquarie perch, and I didn't know about the two types of cod. I've caught the Trout cod down here in recent times. Never saw redfin in the Macquarie until after the dam was built, then they turned up in the river. It was when the freezing cold water come down that I caught the reddies, mostly on the little celtas.

OH 18

Pat Ryan of Wellington was interviewed in October 2007 at an age of 71 years.

I'm 71 years old, grew up in Wellington. About the cod, oh well, there, in my time there's never been a real prevalence of cod, you'd get an odd one. There's Catfish, Silver perch, when I was a kid, and the river was full of goldfish carp. You wouldn't have got a cod a day back then. Never heard about two types of cod till recently, when they put the Trout cod in. There was a lot of Silver perch and Catfish, but they've declined since they put the dam in, they were common up to four years after the dam. The Silver perch probably 4 to 5 pound was the biggest, the biggest Catfish I saw was 7 pound but that wasn't here that was out of the Darling. In the Macquarie the biggest was about 4 pound, they were common at about a pound and a half. To eat, well it was a toss up between yellowbelly and cod. The Catfish were good; we used to skin them and fillet them and then fry the fillets in batter.

The Macquarie perch, the only place I caught one was at Cooma, in the Murrumbidgee. I left Wellington about 1965 to work on the Snowy Mountains Scheme. Never saw a Macquarie perch here. The only unusual fish we used to get here occasionally was the river Blackfish; they used to call them slipperies. Roundabout the turn of the century they were prevalent, that's from some of the old timers, they told me about it. The first one I caught I didn't know what it was. I caught very few of them. From the old timers back then there was a lot of cod, and yellowbelly. In my time there have been very few yellowbelly, the last one I caught was about 1960. The cod, oh roundabout 2 to 3 kilogram was the average size, the biggest one I ever caught was about 20 kilogram, at that size they were an exceptional. The first place I ever seen a redfin was in Blowering. When I left Wellington there was no redfin and no European carp here, so they arrived after '65.

OH 19

Ian Parks of Wellington was interviewed in February 2008 at an age of 40 years.

I'm forty, my grandfather Syd Hubbard originally grew up in Wellington, then went to the war, then Cowra. He'd be ninety odd if he was alive now. He talked about a black bream that was in the Macquarie, but they were not the silver bream or Silver perch. And I heard him mention the Trout cod. He reckoned they were caught when he was a young fellow out around Ponto; the Hubbards were over from Maryvale way. He definitely talked about them that they were around when he was young. It was back in the 1970s when he told me about it.

OH 20

Frank Astell of Narromine was interviewed in April 2008 at an age of 80 years.

I'm nearly 80, been on the Macquarie, been here nearly 80 years, born in 1929. When I was young in the river here was the carp, both the red and the black, and miles of Catfish. I remember once, I'd say I was approximately 10 years old, and we went out to a place called Euromedah Station, just before Good Friday. We got 99 Catfish in one night, that's about 11 mile upstream from Narromine. We did not count them until we got home, we could have stayed and caught another to make a hundred. The biggest was about 2 to 3 pound and the ones you'd mainly get were a pound, pound and a half. Dave McNair got two Catfish about 4 inches long on a 2/0 hook at the reserve down there. A chap got a Catfish here I'd say a month ago that would go 5 to 6 pound. In the late thirties Ted Collins and Wotty McIvor pulled up at the shop in a 1936 ute. They had been fishing at Gin Gin with nets and they had a Catfish of 9 pound with a big 'V' cut in its tail. They said it was caught small and somebody had cut a 'V' in it and released it!

Back then cod were not so common as they have been over the last 20 years. When I was a bit of a kid you mainly caught Catfish and the black bream. And the yellowbelly, you get them, they'd swim over the Warren Weir and the Gin Gin Weir in a flood and you'd get them. You'd get them up to say 4 or 5 pound. Then you'd get the black bream or grunter, you might get a shoal of them, 20 to 30 on worms in the one place. They've thinned out but they're still here. The biggest one I caught was out at Compton Station down the river, it went 13.4 pound. It was just breaking day and I fished on the end of this beach and this storm came up. And I got this big bream. I showed Harry Guildford it and it was put on the scales in the butcher's shop. Back then 2 to 3 pound was the average. The Trout cod they're bluey-green with a slight hump on the back of the head, the colours distinctly bluey. I caught them only recently, going back 8 to 10 years, but I never saw them when I was young. There was one caught here about eight months ago. No, even the old blokes, they didn't talk about a Trout cod or any other type of cod around here. I pulled a lot of cod in over the years and never saw one. Nobody ever talked about them. Or a Macquarie perch or white eye, never saw them and nobody ever mentioned them being caught. And the slipperies they were never here to my knowledge, no way.

In the lagoons, well there isn't many these days, they haven't had water in them for so long. A lot of the lagoons were creeks that would flood when the river filled and the stop running. In them you would get yellowbelly, the odd black bream, plenty of Catfish and an odd cod. There is one place out from Gin Gin, Ewanmar Creek, in a lagoon we used to get all of them there. And there was another fish like a bream but thinner, very silvery with a white belly, they were small, about half a pound, up to a pound and a half, had a very small mouth. They were no good to eat. There used to be a lot of them, but you would never get them on a line, only in the nets. They'd get in the nets and roll them all up. There was another place out on the marshes about thirty miles below Warren, the Narra Creek. This would be in the forties; an old chap on the corner here had a fruit shop. We went into the Narra Creek about half a mile from the Macquarie River and put four nets in and we got 70 to 80 yellowbelly, and Catfish. There was a place 3 miles up the river, old Trescothick owned it, my grandfather took me up there. There was 2 cod heads there, 20 to 30 pound, as gate posts! I cant remember many cod being around when I was young, there was nearly no cod in the Macquarie in the late 30's and early 40's, not like there are now, then they started coming back. Now you can catch cod 5 to 6 inches long. I've caught them on swallows, on the chests of galahs, centipedes, frogs, grubs, now even on cheese. I remember we were out spinning in the fifties about 20 mile downstream. There was these trees leaning over, and the swallows had a nest in them. We finished with 5 cod over about 50 yards near those trees.

OH 21

Ken Jones of Narromine was interviewed in May 2008 at an age of 68 years.

I was born in 1940, grew up near Braidwood on the Mongarlowe. In the Mongarlowe we used to catch what locals called the perch, they had the big hump on the head. We used to catch quite a number of perch, and good sized, up to 4 pounds, and quite a few about a pound. We caught the perch and the eels, which were prolific. Then the trout came in to their own. We used to get the trout in the little creeks in different areas around Braidwood, creeks that were 5 to 6 feet wide, 3 feet deep. Mainly rainbows 30 cm, up to 40 cm, and a few browns. They suddenly took off in about 55, 56, they became common in the river, oh yes, incredible, big thumpers up to 60 to 70 cm. Yes, the perch were still common when I left. In about January 59 I moved to Narromine. There was the cod; they were the most prolific, and the yellowbelly. The grunter or black bream, that's what some call a Macquarie perch here, they were prolific, and the Catfish. The bream here are not the same as the perch in the Mongarlowe. The perch were beautiful to eat. The grunter's become extinct here and the Catfish is an endangered species. I was out ten days ago and we caught nine Catfish, the largest was about 15 cm, within five kilometres of the town. A friend a few days ago got seventeen, the longest was 40 cm.

The Trout cod we've caught several of them since the late 90s, here in Narromine, and down towards Gin Gin as well. They've released them as fingerlings at Dubbo. I haven't seen one since 2000. I'm quite sure I caught a couple of Trout cod in the late 70's, around 78, 79, and I will say this they were nothing of any size, 40 cm maximum. I didn't know what they were but they stood out, they really had the mottling or spots on them. They were very pale in colour with dark or black spots. I spoke to some old guys I knew over at Warren and they said over the years they had caught Trout cod in the past, what we had caught. Common, definitely not, they said they had never been a common fish, just odd ones. They were caught below Warren and about up to Narromine. In one instance this young bloke, he was going out with my daughter, it would be at least twenty years ago, we were down on the river and there was this drum net in the river. We pulled it up and there was one in it, about a foot long. The young bloke said 'what is it, a trout? The mottling really stood out.

When I first came to Narromine there were Brolgas everywhere, but they disappeared. In the past twelve months we have had about ten nesting magpie geese but the brolgas are still not here. Prior to Burrendong we had no problem with the Macquarie Marshes. Since then even with the marsh release a lot of the water has been channelled onto farms, that's what I have put down to the Macquarie Marshes deteriorating. That's why the birds have come here.

18 Lachlan River Catchment

THE LACHLAN.

(From the Empire's Correspondent.)

March 30.—The continued absence of rain causing stoppage of the puddling machines for want of water, is the sole reason of the small escort leaving to-morrow. As before stated, the river, one mile distant, is tabooed for washing purposes, and the supply from the lagoons is exhausted to the last dregs, so that the returns per escort will diminish until we are blessed with the winter's rain.

Great quantities of fish have this week been picked up by hand out of the bed of the lagoon between the Victoria and Caledonian leads, some of the codfish weighing over 30 pounds weight, besides bream, perch, and jewfish, the latter being one of the oddest of the finny tribe, presenting the appearance of half newt, with porpoise head and feelers round the mouth. This fish deposits its ova in a gravelly cell on the bottom, using stones of upwards of a pound weight in their construction (as a blackfellow asserts). Certain it is that little mounds, of beehive form, abound in this lagoon, containing gravel.

Maitland Mercury & Hunter River Advertiser, 5 April 1862

The Lachlan

(From the Empire's Correspondent)

March 30 – The continued absence of rain causing stoppage of the puddling machines for want of water, is the sole reason of the small escort leaving tomorrow. As before stated, the river, one mile distant, is tabooed for washing purposes to the last dregs, so that the returns per escort will diminish until we are blessed with the winter's rain.

Great quantities of fish have this week been picked up by hand out of the bed of the lagoon between the Victoria and Caledonian loads, some of the codfish weighing over 30 pounds weight, besides bream, perch and jewfish, the latter being one of the oddest of the finny tribe, presenting the appearance of half newt, with porpoise head and feelers round the mouth. This fish deposits its ova in a gravelly cell on the bottom using stones of upwards of a pound weight in their construction (as a blackfellow asserts). Certain it is that little mounds, of beehive form, abound in this lagoon, containing gravel.

Maitland Mercury & Hunter River Advertiser, 5 April 1862

Figure 18.1 The Lachlan River Catchment showing major waterways and key localities

18.1 Early European Accounts

George Evans explored west of Bathurst and in May 1815, encountered a large stream which was to be named the Abercrombie River. Later, he reached a larger river between Cowra and Canowindra, exploring downstream to near the present site of Forbes. He named it the 'Lachlan River' in honour of Governor Macquarie (Scott, 2005). In 1817, John Oxley, accompanied by botanist Allan Cunningham, undertook a further exploration of the Lachlan River downstream to the extensive marshes near the confluence with the Murrumbidgee River. Oxley was impressed by the abundance of fish:

> Many fish were caught here, one of which weighed upwards of thirty pounds. / If however the country itself is poor, the river is rich in the most excellent fish, procurable in the utmost abundance. One man in less than an hour caught eighteen large fish, one of which was a curiosity from its immense size, and the beauty of its colours. In shape and general form it most resembled a cod, but was speckled over with brown, blue and yellow spots like a leopard's skin; its gills and belly a clear white, the tail and fin a dark brown. It weighed an entire seventy pounds, and without the entrails sixty-six pounds (Oxley, 1820).

The seventy pound monster was described by Cunningham as 'the largest that has been caught' and he recorded that the catch on one day was 190 to 200 lb. (86.4 to 90.9 kg) of fish (Lee, 1925).

In 1834, naturalist and surgeon Dr. Johann Lhotsky, travelled south through the Gunning area to explore the upper Murrumbidgee catchment. On the 25th of January he camped on the headwaters of the Lachlan River upstream of Gunning. At the time the river was known as the Fish River, probably named like its predecessor near Bathurst, for containing fish in abundance. Lhotsky caught and ate cod upstream of Gunning, recording the presence of cod in a tributary stream of the Fish River in Gunning itself:

> We left the bank of the Fish River at an early hour. The road tended now toward Mr. Kennedy's farm, about which granite is the predominant formation. The latter farm is situated in what is called Goneng Valley intersected by a chain of Ponds. These, the tendency of which is towards the Lachlan, as well as those which run into the Murrumbidgee, and which I traversed afterwards, abound with fish, amongst these, a freshwater cod is the most remarkable, of which some were caught hereabout, weighing as much as 90 pounds (Lhotsky, 1979).

In March 1838, Major Thomas Mitchell travelled along the Lachlan River from Eugowra to near Forbes. The party caught Catfish out of holes from a creek near Eugowra. Mitchell described them as 'eel-fish', and during his first expedition in 1832 along the Barwon River, gave them a species name of *Plotosus tandanus.* In the later trip, the party netted a 17 lb. (7.7 kg) Silver perch and a 12 lb. Catfish from the Goobang Creek near Condobolin:

> On dragging our net through the muddy pond we captured two fishes, but of monstrous size, one weighing 17 pounds, the other about 12 pounds. Although very different in shape, I recognised in them the fish of the perch kind with large scales and the eel-fish formerly caught by us in the Namoi (Mitchell, 1838).

Mitchell also recorded catching Murray cod, identified as *Gristes peelii,* from the Lachlan River near Lake Cargellico.

Samuel Mossman and Thomas Banister wrote extensively on their travels through Victoria and New South Wales in 1852. On a visit to a property near Binalong they recorded that the Boorowa River was *'full of fine fish'* (Mossman & Banister, 1853). Mossman and Banister had been lured to the area by the prospect of

making a fortune from gold. Accounts from the miners record that there was an abundance of fish in the upper Lachlan Catchment. The *Sydney Morning Herald* in 1860 reported how:

> 'A party of Chinamen, on their way to the Tuena gold-fields, during last week, encamped on the banks of the Lachlan, a few miles from Reid's Flat, were fortunate in securing about one hundred and seventy pounds of fish in the space of half-an-hour' which included 'quantities of beautiful cod and bream fish' (Sydney Morning Herald, 20 June 1860).

In 1869, the same paper reported that the Tuena Creek 'abounds in cod fish, perch and bream' (Sydney Morning Herald, 3 July 1869). The Yeo Yeo or Bland Creek near Stockinbingal also abounded in fish. On one occasion a man caught 90 fish with his bare hands, and a man and his wife angled 'no fewer than 453, weighing from ½ lb. to 8 lb. each. These fish were chiefly bream, perch, and cod' (Sydney Morning Herald, 6 November 1872).

The early accounts record an astonishing abundance of fish in the lower Lachlan River. A newspaper describes how:

> '…owing to the succession of floods this season we have the River Lachlan teeming with these fish – fine fellows, from 20 to 30 lbs. weight being constantly caught, and the fish can be seen making their way up the river in large numbers (Sydney Morning Herald, 1 December 1863).'

Another account recorded how at Forbes heavy rain was followed:

> '…by the sickening of thousands of fish, large numbers dying, and the rest becoming so helpless that they could be speared or caught by the hand without any trouble. In this manner hundreds were caught in the neighbourhood of the town, several specimens of the cod, weighing upwards of 40 lbs., and two between 50 lbs. and 60 lbs., being brought to land out of a deep hole near the new bridge (Sydney Morning Herald, 29 December 1866).'

John Langtry during his 1949-52 fish survey of the Murray-Darling system reported on the commercial fishery in the Hillston area, as well as carrying out netting operations in the Willandra Creek. He recounted anecdotes about the fishery from a number of professional fishermen as far upstream as Forbes. Langtry reported that Murray cod, Golden perch, Silver perch and an abundance of Catfish was present in the lower Lachlan River. He also noted an absence of Trout cod and Macquarie perch (Cadwallader, 1977).

18.2 The Past Distribution of Fishes in the Lachlan River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the Lachlan Catchment into a lowland zone (downstream from Condobolin), a slopes zone (upstream to Wyangala Dam), an upland zone (upstream to Gunning and Jerrong) and a montane zone beyond the latter locations. The physical form of the Lachlan River below Forbes is of low gradient, effectively unconfined with extensive billabong and anabranches. For simplicity, the lowland zone is treated here as being downstream of Forbes, and all other habitat zones match those in the *Sustainable Rivers Audit.*

Jane Roberts and Geoff Sainty provided a detailed oral history of the environment of the Lachlan River downstream of Eugowra, effectively covering the entire lowland zone (Roberts & Sainty, 1996). They presented oral history of the fish going back to the 1920s, supported by newspaper accounts. Most of the

information presented below on the lowland zone is sourced from their work, supported by additional oral history. Much of the information on the slopes, upland and montane zones is largely from oral histories of senior residents recalling their own experiences, as well as stories told to them by past generations (mainly OH 22-36). Some early detailed newspaper accounts and information published in the Annual Reports of NSW State Fisheries is used, as well as a few old photographs of catches of native fish in the catchment.

18.2.1 The Montane Zone

Lhotsky's observations in 1834 indicate that cod penetrated the upper Lachlan Catchment into the montane zone upstream of Gunning. His use of the phrase 'amongst these, a freshwater cod is the most remarkable' suggests that more than one species was present (Lhotsky, 1979). His catches, supported by general observations, indicate that cod were at least reasonably common in the montane Lachlan River and some creeks. Second hand oral history from the early years of the twentieth century supports his account of the existence of cod in the montane zone. Cod were present in the Jerrong and Wiaborough Creeks (McAllister, OH 23) and in the Abercrombie River upstream of Jerrong (Newman, OH 22). The specific species of cod in the montane zone is unknown. Based on oral history, both cod species were present in the upland zone, with Trout cod the more prevalent (Flint, OH 32; Lewis, OH 28). It may be inferred that this may also have applied to the montane zone.

The only account of Macquarie perch in the montane zone describes their presence in numbers in the Jerrong area (Newman, OH 22). They were once abundant in rivers near the top of the upland zone (Lewis, OH 28; Croker, OH 24) suggesting that they were probably common in larger montane habitats. Oral history recalls Blackfish to have once been fairly abundant in some rivers and creeks in the montane zone (Newman, OH 22; McAllister, OH 23; Lewis, OH 28). Catfish were occasionally caught in the montane zone near Jerrong (Newman, OH 22) but there is no evidence of the other large native fish species being present in this zone (McAllister, OH 23).

18.2.2 The Upland Zone

The upland zone above the present Wyangala Dam was formerly a region of high fish diversity. Cod were abundant in both the Lachlan and Abercrombie Rivers (Motum, OH 29; Croker, OH 24; *Sydney Morning Herald,* 20 June 1860; 27 September 1893), and common in the larger creeks such as the Bolong, Burra and Tuena (Croker, OH 24; *Sydney Morning Herald,* 3 July 1869). Rod Harrison's capture of a Trout cod (LR5) from the Lachlan River at Reids Flat c1968, confirms that the species was present in the Lachlan Catchment and specifically in the upland zone. A number of oral accounts recall the past presence of Trout cod, including some good descriptions of the fish (Flint, OH 32; Motum, OH 29; Lewis, OH 28; Hanrahan, OH 25). Three accounts suggest that both cod species were common, but that Trout cod were more prevalent, particularly further upstream (Flint, OH 32; Motum, OH 29; Lewis, OH 28).

Macquarie perch were once abundant in the rivers of the upland zone, including the Lachlan, Abercrombie and Boorowa (Croker, OH 24; Hanrahan, OH 25; Elvins, OH 30; Stacey, OH 26). This fish also had a strong presence in small creeks such as the Bramah, Mulgowrie and Taylors Creeks (Elvins, OH 30), as well as Tuena Creek (*Sydney Morning Herald,* 3 July 1869). It has been reported that, until 1970, a small population of Macquarie perch existed in the upland Belubula River (Harrison, 1977; Rod Harrison, personal communication). They were naturally present in the Belubula River up to a waterfall near Junction Reefs which was impassable (Dick Elvins, personal communication). The upland population appears to have been translocated from the Bathurst area in

the early 1880s (*Sydney Morning Herald,* 4 March 1886). Blackfish were generally abundant in all the waters in the upland zone, including the rivers and small creeks (Croker, OH 24; Hanrahan, OH 25; Lewis, OH 28).

The oral history records indicate that prior to the construction of Wyangala dam, Golden perch were regularly taken in reasonable numbers at Reids Flat (Motum, OH 29), occasionally at Reidsdale (Lewis, OH 28) and sometimes in the lower Abercrombie River (Croker, OH 24; Hanrahan, OH 25). In later years they were also taken in small numbers from the Boorowa River (Elvins, OH 30). While regularly encountered they were not very common, particularly in the upper reaches of this zone. Good numbers of Catfish and Silver perch were present in the Abercrombie River (Croker, OH 24; Hanrahan, OH 25; Stacey, OH 26), and good numbers of Silver perch with some Catfish, were taken from the Lachlan River at Reidsdale (Lewis, OH 28). Catches of Silver perch rivalled those of Macquarie perch in the Lachlan River, and were very common to abundant (Lewis, OH 28). In general, the numbers for these three species progressively fell further upstream, with Silver perch reported to be the only one found in any amount near the top of the upland zone (Lewis, OH 28).

18.2.3 The Slopes Zone

This section of the Lachlan River is reported to have contained all the larger native fish species, with Arthur Flint providing a detailed first-hand account of the fishery back to the 1920s. There was a noticeable decrease in abundance of Trout cod and Macquarie perch near Cowra compared to upstream of Wyangala (Flint, OH 32). Murray cod were very common at Cowra, but Trout cod were caught in smaller numbers, being much more common upstream towards the gorges in the Wyangala region (Flint, OH 32). Neil Cambell reported that two Trout cod were taken near Canowindra in the 1960s (Cambell, OH 34) which were formally identified by members of NSW State Fisheries (Neil Cambell, personal communication). Cod were also very common in some major tributaries such as the Belubula River near Forrest Reefs (*Sydney Morning Herald,* 2 September 1910; 9 January 1912) and in the Bland Creek near Stockinbingal (*Sydney Morning Herald*, 6 November 1872; *Sydney Mail***,** 3 January 1923).

Macquarie perch were regular captures near Cowra, but secondary in abundance to Golden perch and Silver perch (Flint, OH 32; Bryan, OH 33). A newspaper account describes 'bream' and 'perch' being abundant in the Bland Creek near Stockinbingal in 1872 (*Sydney Morning Herald*, 6 November 1872) however, it is impossible to determine their identity. The fish appeared to have declined progressively downstream in this zone being abundant at Wyangala, common at Cowra and occasionally captured near Canowindra (Flint, OH 32; Cambell, OH 34). Catfish were abundant in the Lachlan River near Cowra (Flint, OH 32) and in some tributaries towards the bottom of the slopes zone (Roberts & Sainty, 1996). Blackfish were abundant at Cowra (Flint, OH 32), and at times large captures were taken in the Lachlan River near Canowindra (Craven, OH 35) and in the Belubula River and its tributaries (*Sydney Morning Herald,* 2 September 1910, 3 September 1910).

18.2.4 The Lowland Zone

In the lowland zone there appears to have been Murray cod, Golden and Silver perch, and Catfish in abundance in the Lachlan River, major anabranches, creeks, lakes (Roberts & Sainty, 1996; *Sydney Morning Herald,* 1 December 1863; Craven, OH 35; Cussack, OH 36) and in the lagoons (*Maitland Mercury & Hunter River Advertiser,* 5 April 1862). The lower Lachlan once supported a substantial commercial fishery for cod (NSW Fisheries, 1898-1928), and in Lake Cargellico cod were considered to be 'easily caught' (*Sydney Morning Herald,* 26 April 1911). Langtry reported that Trout cod were absent from the lower Lachlan around 1950 (Cadwallader, 1977), and a commercial fisherman familiar with the species, J.H. Jarman of Narrandera, reported the same situation in 1920 (*Argus,* 1 October 1920). A news item from Forbes records the capture of

a number of very unusual cod that were dark coloured cod with a 'pronounced hump on the shoulders' (*Forbes Advocate*, 8 May 1917). This may be a description of Trout cod, but is too limited in detail to be conclusive. The collective evidence is that Trout cod were absent or at best very rare in the lowland zone.

Macquarie perch appear to have been absent in most of the lowland zone. Grove Craven, who fished the lower Lachlan since the 1920s, could not recall seeing a Macquarie perch downstream of Euabalong (Craven, OH 35) and they were unreported by Langtry in the lower Lachlan at the end of the second World War (Cadwallader, 1977). The *Western Champion* of 25 April 1918, recorded a party of anglers catching Murray cod, Golden perch, Catfish, Macquarie perch and Blackfish from the Bundaburra Creek near Forbes. While not conclusive, due to possible confusion with Silver perch, it suggests that some Macquarie perch were present at the top of the lowland zone. The account is significant, as it clearly describes the presence of Blackfish in lowland habitat. There are no historical records of Trout cod, Macquarie perch or Blackfish downstream of Forbes, but a minor presence is plausible, particularly for Blackfish, which have been reported from the lower Murrumbidgee near the confluence of the Lachlan.

Golden perch and Silver perch were abundant along the length of the lower Lachlan (Craven, OH 35; Cussack, OH 36). Catfish were particularly abundant in some creeks such as Goobang and Bundaburra Creeks. In Bundaburra Creek, 81 Catfish averaging 2 lb. (0.9 kg) were taken on one occasion (Roberts & Sainty, 1996; *Western Champion,* 16 December 1915). In lagoons near Forbes, Catfish were present and extensive nest construction was reported (*Maitland Mercury & Hunter River Advertiser,* 5 April 1862). A similar situation existed in local lakes such as Lakes Brewster and Cargellico, where Catfish were once the most abundant species taken by anglers (Roberts & Sainty, 1996).

18.2.5 Estimates of Native Fish Abundance in the Lachlan River Catchment at European Settlement.

Presented are the rarity scores used in the Sustainable Rivers Audit (Davies et al., 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts**.**

Table 18.1 Lachlan River Catchment Rarity Scores (Main River Channels)

	Lowland (downstream of Forbes)		**Slopes** (Forbes to Wyangala Dam)		**Upland** (Wyangala Dam to Gunning & Jerrong)		**Montane** (upstream of Gunning & Jerrong)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod	0	0	3	L3	3	5	1	3
Murray cod	3	**5**	5	**5**	5	3	3	L3
Golden perch	5	**5**	5	**5**	5	**1**	3	0
Silver perch	5	**5**	5	**5**	3	**L5**	0	0
Macquarie perch	0	0	3	3	5	**5**	5	**L5**
Catfish	5	**5**	5	**5**	5	**U3**	3	**1**
'Blackfish'	0	L1	1	U3	5	**5**	5	**L5**

Key

0 = Absent: no credible account reporting the species former presence

1 = Rare: a few individual fish could be expected to be taken by a resident angler each year

3 = Common: regularly taken by a resident angler in small numbers

5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating

U = abundance at the upper end rating

Ratings in bold type are supported by multiple accounts or lines of evidence e.g. oral history, newspaper accounts, photographs

Figure 18.2 **Historical Records for Murray cod and Trout cod in the Lachlan River Catchment**

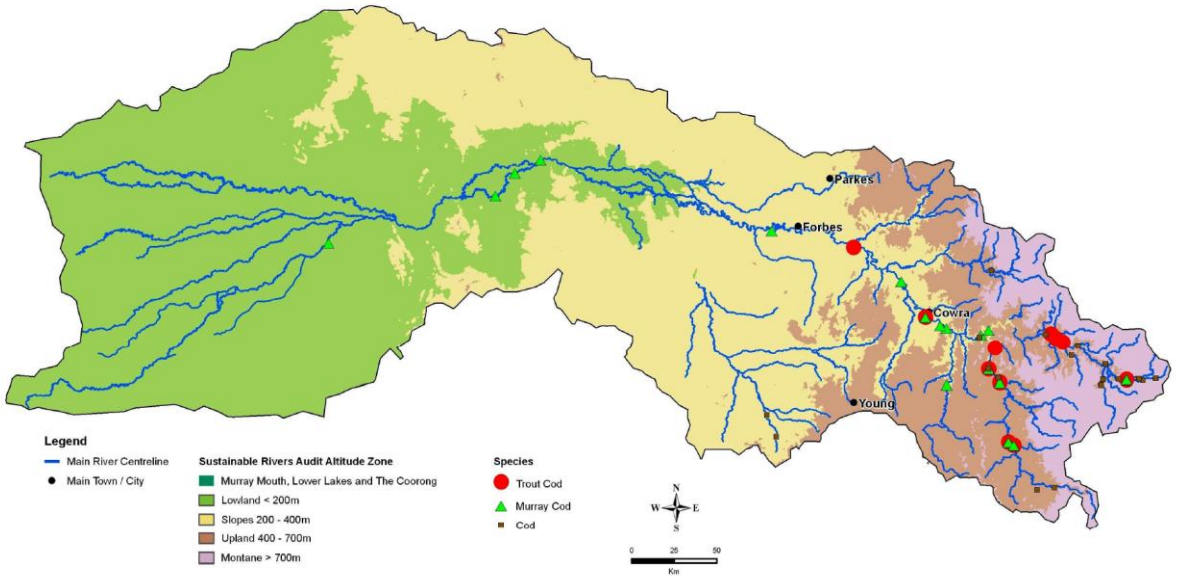
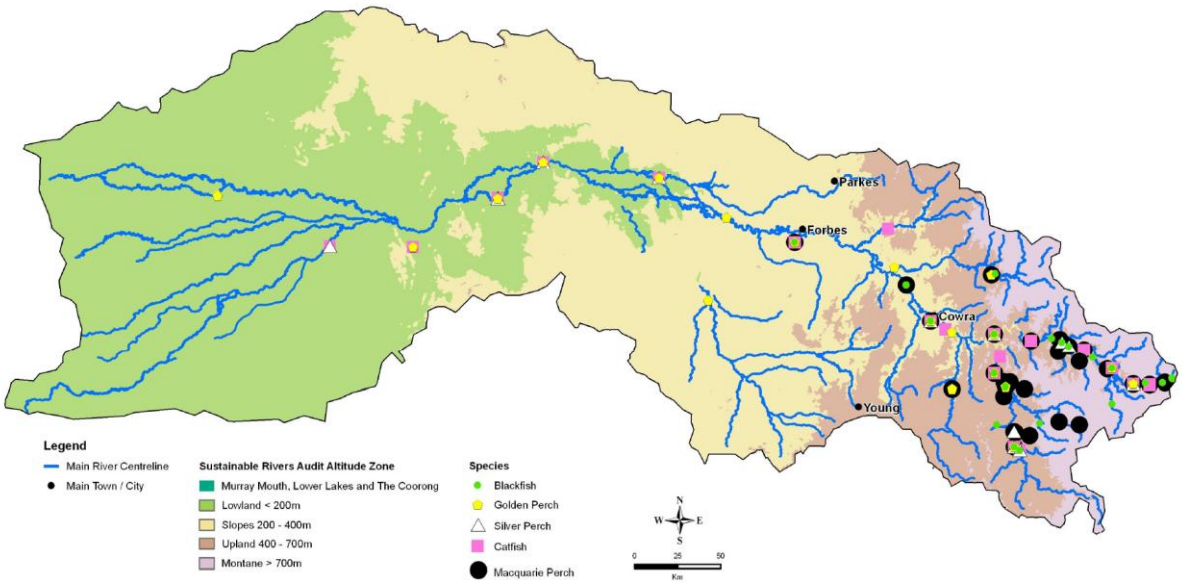


Figure 18.3 **Historical Records for Native Fish Species other than Cod in the Lachlan River Catchment**



Photograph 18.1 Lachlan River Trout Cod

Photo LR5. Respected angling writer Rod Harrison captured this Trout cod while spinning for trout in the Lachlan River at Reids Flat c1968. Rod also played an instrumental role in the discovery of the Trout cod population and hybrids in the Cataract Reservoir near Sydney. The photograph confirms the historic presence of the species in the upper Lachlan and supports the accounts of Joe Lewis, Mona Motum and Tibby Flint that the species was once prevalent in those waters. Photo courtesy of Rod Harrison.

Photograph 18.2 Cowra Catch

Photo LR 1. Arthur 'Tibby' Flint with a catch of fish including Murray cod, Golden perch and Catfish downstream of Wyangala Dam c1945/50. Photo courtesy of Tibby Flint.

18.3 The Changes

18.3.1 Changes to Native Fish Distribution and Abundance

A handful of accounts provide limited information on the decline of native fish in the montane zone. Cod had declined by the early twentieth century and completely disappeared by the 1920s (Newman, OH 22; McAllister, OH 23). Macquarie perch were largely restricted to the lower reaches of this zone by the 1920s, but persisted in numbers in the Jerrong area, and near Crookwell until the 1950s (Newman, OH 22; Lewis, OH 28). By the 1920s, Blackfish are reported to have undergone a decline in some waters, with the fish vanishing from many areas by the 1950s (Newman, OH 22; Lewis, OH 28).

Early in the twentieth century, the upland zone still contained significant native fish populations. Major declines are reported by the 1930s, and cod were generally rare by this time (Flint, OH 32; Elvins, OH 30) though small numbers were captured in the Narrawa area until the 1950s (Lewis, OH 28). Isolated captures of cod subsequently took place, with the last reported capture of Trout cod occurring in 1968 (Rod Harrison; pers. com.). Macquarie perch, Silver perch and Catfish flourished in the newly constructed Wyangala dam in the 1930s (Motum, OH 29; Flint, OH 32). By the 1950s, Macquarie perch had undergone a decline in the Abercrombie River, Lachlan River and tributaries near Reids Flat (Croker, OH 24; Beer, OH 31; Elvins, OH 30). By the 1960s, this was also the case in the Narrawa area (Lewis, OH 28). Blackfish disappeared from a number of small streams during the 1950s (Beer, OH 31; Elvins, OH 30).

Near Cowra, a decline in the abundance of Macquarie perch and Trout cod commenced during the 1930s and this meant that by the 1950s Macquarie perch were rare, and Trout cod virtually absent (Arthur Flint, pers. com.). In the lowland zone, declines in native fish populations in some areas were observed by the 1950s, with a serious decline noted by the 1970s (Roberts & Sainty, 1996).

18.3.2 Changes to Habitat

Mining and agriculture caused silting of some upland waters, with Junction Reefs Dam on the Belubula River filling with silt by 1920 (Scott, 2001). Silting of holes in the lower Abercrombie River was evident by the 1930s (Croker, OH 24), and this was widespread in the upper Lachlan River by the 1960s, with many holes completely disappearing (Elvins, personal communication). By 1972, the upper Lachlan generated one of the highest annual sediment yields per square kilometre - almost double that of the upper Murrumbidgee River and upper Murray Rivers (Scott, 2001).

Large fish kills associated with drought occurred in the lower Lachlan in 1919 but were considered natural, with fish populations subsequently recovering (NSW Fisheries, 1919; 1930). Kills attributed to mining pollution took place in the Belubula River in March 1907 (NSW Fisheries, 1907), and again in July of that year when it was reported that ‘copper, with which the water from the mine is impregnated, has coloured the stream blue, and fish in hundreds are floating dead on the surface’ (Sydney Morning Herald, 25 July 1907).

A bushfire, followed by a storm event washing ash into waterways in the late 1920s, is associated with massive fish kills in the upland Abercrombie and Lachlan Rivers, after which cod were generally rare (Motum, OH 29; Flint, OH 32; Beer, OH 31; Burns, OH 27; Hanrahan, OH 25). A small recovery of cod occurred in the newly filled Wyangala Dam, but a second bushfire event in 1939 is reported to have eliminated the species from the area (Flint, OH 32).

The first weir in the catchment was built by miners at Junction Reefs on the Belubula River in 1897. More weirs were progressively constructed on the Lachlan River to divert water for agriculture. Construction of

Wyangala Dam which commenced in 1928, and was completed in 1935, created a barrier to the upstream movement of native fish. It was reported that Golden perch subsequently disappeared upstream of the dam (Lewis, OH 28; Dick Elvins, personal communication). It has also been suggested that a decline in the number of Macquarie perch and Trout cod near Cowra has taken place after the commissioning of the dam, possibly due to restricted fish passage and changes to flows (Arthur Flint, personal communication). The capacity of the reservoir was enlarged in 1971. A relic population of Macquarie perch in the middle Belubula River disappeared after the construction of the Carcoar Dam in 1970. Reduced flows are again suspected as being responsible (Harrison, 1977 and personal communication).

It is likely that Macquarie perch were translocated to the upper Belubula River in the early 1880s (*Sydney Morning Herald,* 4 March 1886), and Murray River crayfish were introduced to the Canowindra area in 1915 (NSW Fisheries, 1915). An unsuccessful attempt was made to introduce Australian bass to the Crookwell River (NSW Fisheries, 1910-13). Redfin perch, 'carp' and Tench were introduced to the Lachlan Catchment at Pinnacle Station near Forbes in 1885 (*Bathurst Free Press & Mining Journal,* 24 June 1885), and in 1885, Redfin perch were stocked into a dam near Grenfell which was then used as a source to stock other waters in the catchment (*Sydney Morning Herald,* 4 September 1885; 5 September 1885; 3 December 1888). John Langtry reported that they appeared in large numbers near Hillston around 1940, and moved upstream reaching the Forbes area by about 1950 (Cadwallader, 1977). Some residents associated a decline in native fish numbers with the proliferation of Redfin perch (Flint, OH 32; Roberts & Sainty, 1996).

Brown trout were introduced near Taralga and Crookwell in 1892 (NSW Fisheries Reports, 1892, 1904). They were associated with the decline of cod and Blackfish in the Jerrong area in the early twentieth century (McAlister, OH 23), and the rapid disappearance of Macquarie perch and Blackfish in some small upland creeks near Wyangala during the mid 195's (Elvins, OH 30; Beer, OH 31). The Boolarra strain of European carp arrived in the Lachlan Catchment during the 1970s. Many residents noted declines in native fish populations in the lower Lachlan after the arrival of European carp, particularly Catfish. One resident reported the presence of thousands of small Catfish in the Lake Brewster Weir during the 1970s, but after carp arrived much of the aquatic weed disappeared, as did the Catfish (Roberts & Sainty, 1996). The arrival of European carp in the 1970s in Wyangala Dam occurred after the local decline of Macquarie perch populations, but coincided with a rapid reduction in the Catfish and Silver perch populations (Beer, OH 31; Elvins, OH 30).

18.4 The Current Situation

The *Sustainable Rivers Audit* concluded that 'the Lachlan Valley river ecosystem was in Very Poor Health'. Overall, it concluded that native fish populations in the Lachlan Catchment were in 'Extremely Poor Condition' due to a 'loss of species richness, low abundance of native species and intrusions by alien species' and that 'most expected species were absent' (Davies *et al.,* 2008).

Large native fish are very rare in the montane zone. There has been a major loss of biodiversity in the upland zone, with Trout cod believed to be extinct. A small stocking took place in the Abercrombie River with a few captures subsequently taking place. Blackfish are now scarce, and upland populations of Murray cod and Golden perch are supported by stocking in Wyangala Dam. The upland zone contains a population of Macquarie perch of high conservation significance, primarily in the Abercrombie River with a diffuse population also present in the Lachlan River upstream of Wyangala. Redfin perch appeared upstream of Wyangala Dam in 2005 after having been released into a farm pond, and these fish are now in abundance and posing a major threat to the Macquarie perch population. Downstream of Wyangala Dam in the slopes and lowland zones, Macquarie perch and Trout cod are absent. While greatly reduced, populations of Murray cod, Golden perch, Silver perch and Catfish still exist.

18.5 Newspaper Highlights

Sydney Morning Herald, 20 June 1860
Fishing in the Lachlan. A party of Chinamen, on their way to the Tuena gold-fields, during last week, encamped on the banks of the Lachlan, a few miles from Reid's Flat, were fortunate in securing about one hundred and seventy pounds of fish in the space of half-an-hour. The banks of the river are studded with blind creeks and lagoons, which are supplied by the efflux of the stream, and into one of these pools or creeks the Chinese shed a quantity of that powerful narcotic known to chemists as cucculeus indicus, and its effects soon became visible by the quantities of beautiful cod and bream fish floating on the surface which were speedily transferred to the Chinese's tent and pickled for future use.

Sydney Morning Herald, 1 December 1863
Acclimatisation Society of New South Wales. / "Just now," said the writer "owing to the succession of floods this season we have the River Lachlan teeming with these fish – fine fellows, from 20 to 30 lbs. weight being constantly caught, and the fish can be seen making their way up the river in large numbers."

Sydney Morning Herald, 29 January 1866
The Lachlan. / A remarkable phenomenon was produced by the first fresh in the river a short time ago. The water which was from the Belabula rivulet, was strongly impregnated with red clay, and its appearance in this part of the Lachlan, and I am informed as far as the fresh reached, was immediately followed by the sickening of thousands of fish, large numbers dying, and the rest becoming so helpless that they could be speared or caught by the hand without any trouble. In this manner hundreds were caught in the neighbourhood of the town, several specimens of the cod, weighing upwards of 40 lbs., and two between 50 lbs. and 60 lbs., being brought to land out of a deep hole near the new bridge. Shrimps in myriads were also cast upon the sandy banks

Sydney Morning Herald, 3 July 1869
Rich Gold Discovery at Trunkey Creek. / Tuena / It is situated on Tuena Creek, about 4½ miles distant from its junction with the Abercrombie River, which runs about 5 miles N. of Tuena, and traverses the district from E. to W. It is of considerable magnitude, and at times, during floods, rises to a height of thirty feet above its usual level. It abounds in cod fish, perch and bream.

Sydney Morning Herald, 22 April 1871
Canowindra. / The river is at present flowing, a shallow stream of a uniform width of about 40 feet, and an average depth of 2 feet. Small fish abound, and the diggers may be found angling in places where the water is deep, in order to vary their eternal diet of bread and meat. Fish from ½ to 3 lbs. are the reward of patience and suitable times—as the fish do not always bite freely.

Sydney Morning Herald, 6 November 1872
Fish in the Murrumbidgee - It is not often (says the Wagga Advertiser) that one hears of so splendid a haul of fish as that which was made a few days ago at Geraldra. Our informant, Mr. Allen, mentions that while they were at dinner one of his servants brought him upwards of ninety fish of all sorts and sizes, which had been captured in the Yeo Yeo Creek, without the aid of net or line, but simply with the hands. Subsequently one man and his wife caught no fewer than 453, weighing from ½ lb. to 8 lb. each. They were chiefly bream, perch, and cod, and were taken in the ordinary way with a hook.

Sydney Morning Herald, 4 March 1886
Carcoar, Wednesday. Some perch ova were put into the Belabula River about four years ago, having been brought from the Macquarie River. Several perch have lately been caught weighing from ½lb. to 5lb. each.

Sydney Morning Herald, 27 September 1893
Trunkey. Tuesday. / The fish in the Abercrombie are biting freely. Some fine cod were hooked on Thursday night, one fish being 8 b. in weight.

Sydney Morning Herald, 25 July 1907
A Polluted Stream. Carcoar, Monday. Landowners living along the Belabula River between here and Blayney are complaining bitterly at the present state of the water, alleged to be caused through the mineral water from a copper mine being pumped into the stream. The copper, with which the water from the mine is impregnated, has coloured the stream blue, and fish in hundreds are floating dead on the surface.

Sydney Morning Herald, 2 September 1910
Forest Reefs, Thursday. Owing to the discoloured waters of the Belabula River, fish do not appear to bite too well, though cod up to 3lb weight, several trout, and many slipperies were landed last week. These slipperies are equal to garfish. Some sport catching these in different creeks may now be had.

Sydney Morning Herald, 9 January 1912
Forest Reefs, Monday. During the holidays different spots on the Belabula afforded some fair sport, and Mr. G. Jarvis landed nine fine cod. Others of his party, not used to rod fishing, brought the total to sixteen, the largest weighing 4lb.

Western Champion, 16 December 1915
Messrs. Sayers and Williams had a royal time amongst the fish in Bundaburra Creek last Thursday evening and night. On bamboo rods, the landed no less than 81 catfish, averaging 2lbs., and on a cross line secured a fine 45lb. cod.

Forbes Advocate, 8 May 1917
Mr. Sayer also tells us of a remarkable run of codfish which never exceed 12lb. in weight, and never are caught below the town weir. He describes them of having a pronounced hump on the shoulders, being very dark along the back and being yellow underneath. From the description, they would appear to be the result of inter-breeding between the Murray cod and golden perch (yellowbelly).

Western Champion, 25 April 1918
A fishing party at Bundaburrah Creek last Saturday secured 5 varieties of fish. They were Murray cod, golden perch, Macquarie perch, catfish and river blackfish (slippery).

18.6 Significant Extracts from the Annual Reports on the Fisheries of NSW

1907
Owing to the death of a number of fish in the Belubula River, in March, inquiries were made to ascertain the cause, and it was ascertained that the Copper Company were discharging the water from their old copper mine into the river, and that the fish were adversely affected by it.

1915
Permission was sought by the Canowindra Progress Association, to transport Murrumbidgee lobsters from the Tumut River to local waters. This was granted.

1910-13
Dissemination of Australian bass. / 1,020 yearlings were taken to Crookwell, and there liberated into “holes” on the Crookwell River and Kiamma Creek.

1919
A visit of inspection was made to the Lower Lachlan River between Cargellico and Oxley, with a view to ascertaining the fishery there. It was found that the waters were very low, and fish were dying in large numbers. Subsequently, very heavy rain fell at and above Thelangerin, causing the river to flow from below Booligal to the reed beds, and the remainder of the fish in that area were saved.

1930
Worse than drought is the effect of the first freshet thereafter; the dry watercourses have been made the receptacle of all the fallen eucalyptus leaves and bark from the trees standing in the channel and on the banks from the excrement of stock which find shelter under the eucalypts from the summer sun; at times the accumulation is like a carpet, inches in depth.

A few years ago—at Booligal, the local police officer reported that he had employed a man with a horse and dray to remove great numbers of dead fish from the low weir there and cart them away—they had been destroyed in the manner described by the first small freshet after a drought, had drifted down with the current and accumulated against the weir / This has been going on since the world began and will continue until doomsday, yet so great is the power of recovery of our fisheries that given good seasons within a couple of years the fishery is restored—by migration and by natural reproduction.

18.7 Lachlan River Catchment Oral Histories

The following oral histories (OH 22-36) mostly discuss the Lachlan Catchment.

OH 22
Noel Newman of Goulburn was interviewed in February 2008.
Jack Newman was my grandfather. In 1908 he took up some land on the south side of the Abercrombie River. It was just west of the Jerrong Road, and Long Swamp Creek ran through his property joining the river there. He named the property 'Long Swamp' for this reason. Jack's brother's land was closer to Taralga. Jack had two sons, Bill (who was my father) and Charlie. Charlie also took up land that joined Jack's property on the west so between them they had about two miles of continuous frontage to the Abercrombie on the south bank.

When the Newman family went to live at 'Long Swamp' in 1908 there were cod and Catfish coming up the Abercrombie as far as Long Swamp Creek, I was told that they did not go any further up than the junction even then. The cod were around six to eight pounds, they were only small ones, I think they had already been in decline for a while and they slowly disappeared. Eventually a big fire went through and that probably finished them off, after a big bushfire there was always a big reduction in the fish population. My cousin John, who was Charlie's son, was born in 1935 and lived there for years, spent a lot of time fishing in the Abercrombie and he said there were no cod or Catfish in his time.

The trout and Macquarie perch were plentiful in the upper reaches of the river, about a mile and a half above the Jerrong Road crossing is as far up as I have heard of the perch. They were generally called a black bream. The biggest bream would have been about two and a half pound, the average size about three quarters of a pound; they were very good to eat. The slipperies, sometimes called blueys, were in nearly every stream, right up to blazes, right up to the top. Upstream from Jerrong Road Crossing was where the Back Creek joined the river on the south side; Millamein Creek was a tributary of Back Creek. There were slipperies in those creeks.

Some good fishing places on the Abercrombie were known by name. Starting about a mile above the Back Creek junction there were the Black Holes also known as Wunnyallabay Holes, the Goose Hole near Jerrong Road crossing, then the Women's Fishing Hole, the Round Hole, Little Rocky Hole, McKenzie's Crossing, Eagle Hawk's Nest Hole and the Long Hole.

OH 23
Peter McAllister of Golspie was interviewed in February 2008
I think my father caught the last cod out of the Abercrombie, it was about 5 pound, he caught it out of what was known as the 'cod hole' about five miles as the crow flies below Bummaroo Ford, about seventy to eighty years ago. I'm almost 70, I started going fishing to the Abercrombie when I was about six or eight years old and I didn't see it. The cod were through all the headwaters in all the spring creeks. Creeks like the Jerrong and the Wiaborough the old hands said there was plenty of cod in them; they got massive cod out of them. Eighty to ninety years ago every big hole had the cod in it, plenty of them. What they said was after the trout were put in the cod they disappeared.

And there was the blueys or slipperies they grew up to half a pound up in the headwaters, there was a lot of them up there too. In the Burra Creek it was nothing to catch half a sugar bag of blueys seventy to eighty years ago, that was from the old hands. The bream they went fairly well all the way up and plenty of them. The bream, back thirty years ago there was still plenty of them in the Abercrombie up to two to three pound. The little streams when I was a kid I caught heaps of what I used to call the spotted and striped gudgeon, yeh that's the purple spotted gudgeon. I haven't seen any in the streams for five years. There wasn't so many in the

Abercrombie or the Burra Creek the trout used to clean them up. You'd get them in the creeks where there wasn't the trout. Like Monkey Creek it runs into the Burra, Flanagans Creek, and Golspie Creek; they were in their hundreds in the little creeks.

There was a few Catfish caught back about forty years ago, they came up to the Bummaroo Ford for the one year, it was after Wyangala filled, not many, one was caught just below the ford and a few further down. The yellowbelly or the grunter I never heard of them caught up here, I think it was just too cool for them. There used to be a lot of the white claw crayfish, they've disappeared since the carp came in. Going back thirty to forty years I often got them fishing just on worms. As far as I know they were native to the area, the old hands talked about them. You could see them in the creeks, just their white claws which stood out; they went right up into the headwaters.

When they put the trout in the cod disappeared, that's what I was told, and the blueys disappeared from a lot of places too. The trout here didn't grow too much of a length, I used to go spinning and fly fishing; you could catch forty or fifty of them in a day. I once got thirteen in thirteen casts with a spinner; it got caught on a rock on the fourteenth cast. I can remember if you went a day's fishing you'd catch that many trout, you'd give them all away for a bream. Then the carp came in, and we've had the drought, I've never before seen the Abercrombie stop running, it did last year.

OH 24

Les Croker of Golspie was interviewed in March 2007 at an age of 64 years.

They settled the property in 1882 that was my grandfather. My grandmother was born in 1865, about 1881 they set up a house at Pine Grove on Phil's River. My father was born in 1902, my grandfather died in 1927, I was born in 1944. I used to get all these stories from the past as bedtime stories. My family, they used to be keen fishermen, they'd fish the Abercrombie every two to three weeks through summer. Back then the river didn't have any of the rubbish in it like it has now. I was told that originally there was all big Oaks in the paddocks and along the river. You could walk right along the river. Today there is lots of small Oaks and the rubbish like the blackberries, all since the big trees have gone.

They told some wonderful stories, a lot of the family members; they would go out fishing and stay the night. In this creek where we live today, the Boree or Burra Burra, they said the cod were that thick you could catch them by tying a hook on a stockwhip and using a bit of red flannel to catch them. The cod were in the Abercrombie, the Boree which was also known as the Burra Burra, they were particularly thick in that, there was no sand in there, just big rocks. There were cod in the lower parts of the Bolong. There was a wall or rock bar about thirty feet high on the Bolong, none of the native fish was caught above that. There was only trout above that. Years ago you could see the trout die in the Boree and the Bolong from the heat in summer. They would just go still in the holes and then they would just disappear. The Macquarie perch, well they were the black bream here. They were so thick I was told you had a job to keep the bait away from those that were three to four inches long. They were caught up to about 3 pound or a bit better. Dad got one in the Abercrombie about 3 pound the last time he went out, that was in the early 70's.

My grandfather and a brother in law one day hooked into a good cod at Scrammy's waterholes, named after a man with a "scrammy" or withered hand. They both held onto the line, it was a set line, to try to land this fish, but it broke away, he said it was as big as a pig. Another story was that one fellow got himself a cod, but it tied itself around a stump or tree. They found him some time latter all rotted with the jaw still with the line on the tree. The cod well I think they got quite a few around the 5 pound mark; the biggest one known was 25 pound out of the Big Hole in the Abercrombie. My father never said that yellowbelly had been caught here, there was the gudgeon, the black bream and the cod from the early 1900's up to the 1930's, and Catfish. On one occasion

my father caught a 5 pound Catfish and my grandfather a 5 pound cod. Apparently there had been quite a few Catfish, they would come and go, but that was before I went out there. My grandfather put trout into Phil's River; I don't know what was in there before then. My dad's brother apparently was skinning rabbits out there and threw some legs in and these fish that were about three feet long and thin, well they ate them. They could have been cod.

I can remember my father, we went down to Francis's Crossing, but when I got bigger he brought me up here. There was a big hole; there was a big rock above Cameron's Hole, a wonderful spot for the Macquarie perch. Up above there was Scrammy's Hole then Pete's Hut. One night we caught 27 Macquarie perch, in Cameron's - that was in the early 1950's. They would have been from 10 to 14 inches long. The big hole by then was a disappointment, it had been cut in two, and it had silted up from the erosion. I was told that there had been plenty of cod and the Catfish out there, but the Macquarie perch were still there. There was a fish like a gudgeon, the slimy, the slimies are still out there, and I caught a few there with my son out there at Reedy Gully Hole about six years ago. In the old days the bait for the cod was the oak grub, out of the tree, and crayfish. The bait for the bream or Macquarie perch was worms.

The cod were pretty well gone before the war, though there were odd ones around. There was a big hole in the Bolong, with a big cod in it. The trout were plentiful, and the bream, up till the 1960's. Back in those days there was such a flow in the Abercrombie you couldn't cross it in summer without getting wet. I think now it's gone twelve months without running. The only one that continually runs is Phil's River. In the Myanga Creek there's a lot of sand, it filled the Abercrombie, below the junction of the Bolong there's a lot of sand, up above there is a lot of gravel. Dad thought it was caused by all the rabbits. Every sheep dip when they started dipping sheep was built on a waterhole, all the arsenic drained into the river. I think that destroyed a lot of the fish. There was also a lot of rabbits poisoned with the phosphorus, I think that went down into the river too.

After reading Jack Rhodes' stories, which I found extremely interesting, I have this to add. Uncle George Smith and my grandfather William Croker that hooked onto the biggest cod ever seen in the Abercrombie were using a horse hair line (as mentioned in Jack's stories), and I heard uncle George make the remark that was the only fish he ever knew of to break a horse hair line. Also with reference to the "up country swing" and a "flight to the bank" uncle Johnny Weekes was the most notorious fisherman of this style – he tore the gills out of the first trout caught in the Abercrombie which then floated to the surface.

OH 25

Peter Hanrahan of Bathurst was interviewed in November 2007 at an age of 55 years.

I'm only 55, but my father Lambert Lake Hanrahan had a few stories about the fish, he grew up around Triangle Flat, that's near Burraga. He told me about the Abercrombie, how there was a fire out there in 1929, and that knocked the cod about, but there was the bad one in 1939 and then a flood, that knocked them right out. He was only a kid, but he remembered going out there fishing with his older brothers and his father. There were cod and that many Catfish up to 4 pound, they threw them up behind the logs, they were after the cod.

There was stacks of what he called the bluegut, they used to go in behind Trunkey Creek, and there was three holes, at Rosebottom, the Sounder Hole and the Sandy Hole. He never caught yellowbelly there, but he caught what he called the silver bream and the black bream. I'm sure he talked about the rock cod there too, and how they used to love the rocky water holes out there. The Abercrombie silted up in the 1930s, all the sand come down the Bolong. I've caught stacks of Macquaries out of the Abercrombie, there still there up above the Retreat River.

In the Macquarie, there was this old barber in Bathurst back in the 70's, old Miller. He used to talk about catching Macquarie perch in the Randwick Hole, along the Bridle Track, that's about 30 k's below The Forge towards Hill End. It would have been the 40's when he was talking about catching them. We used to tell him he was a 'silly old bastard, that there was no Macquarie perch in the Macquarie'! I remember an acquaintance of my father, Offo Press; he talked about all the cod that used to be caught at Mt David, and what they called the bream, that's up quite high on the Campbell River. He was talking about the 1920's.

OH 26

Veeny Stacey of Bathurst was interviewed in November 2007 at 94 years of age.

My father used to go fishing down to the Abercrombie; it was in the sulky days. I can remember the terrible fires out there in 1927, 1939. I was born in 1913, it was when I was a bit of a kid, I suppose I was 8 or 9 years old. You went down through Trunkey, down to the river. He used to catch them on worms; he would be digging for worms for a week before he went down. There was none of those modern lures to catch the fish then. They used to go out at Curragh that's one place they went, I'm sure, and they went out through Trunkey, it wasn't far to go.

He used to bring home a wheat bag full of the bream, they were a beautiful fish. My father used to salt the bream in the middle. I'm not really a fish eater but if someone put a bream in front of me now I would eat it, they were beautiful. They used to catch a few Catfish there, but nobody ate them. I never saw the Catfish, just heard about them. I think some people thought they were poisonous, but there was so many bream. The bream, well I suppose they were up to about 3 pounds, 2 ½ to 3 pounds I would say.

When we were kids I would go down with my brother and sisters, we would catch the gudgeon, in a creek called Burn's Creek, it started after Triangle Flat, it was a big creek, never went dry. We used to cook up the gudgeon, they were lovely. Sometimes they were much bigger, up about six inches long, they were a little bigger in some pools where there was less of them, they wouldn't have to fight over the food. I remember they had white bellies and I think a few spots down the side, they were in all the creeks around there. They weren't the blueguts I know about them, they were called a gudgeon. I hate worms so we didn't use them, we would catch them on a bit of meat, they would snap at anything.

OH 27

Wayne Burns of Triangle Flat was interviewed in November 2007 at an age of 58 years.

I'm 58, live at Triangle Flat. My father, they used to catch the cod and the bream, him and his brothers. They used to use the old chord lines and big old black hooks, I don't think they had eyes on them, they were just tied on. I can still remember them sitting in the buckets. Out through Trunkey, on the Abercrombie, near where the bridge is, that's where they used to fish. There's a camping area there now, we used to go out there. I can remember only catching trout, it was full of trout. Dad died in 73, and he was talking about the cod from a long time ago, it would be the 40's or earlier. I never saw the fish; he was talking about when he was young. I know they used to use the wood grubs.

Just thinking about what they said, the cod were about 5 to 10 pound; 10 pound was a big one. They said they used to catch the cod there, and they talked about the black bream. There was another fish out there, the slipperies, they mentioned them but they didn't fish for them, they were after the cod. They said once the bushfire went through that was the end of it, the end of the cod. They never got a cod after it.

OH 28

Joe Lewis of Narrawa was interviewed in December 2007 at an age of 67 years.

Well I'm 67 nearly; I was born near Crookwell but grew up down here at Moorabinda. I actually live in the district of Crookwell, Narrawa. We're only 4 to 5 k's from the Lachlan. My relatives probably arrived in the 1850's, they actually were dairy farmers, they came to Bevendale, south of here, then they spread further and further west. My father had the stories; he always used to say that at Easter time he wouldn't have to buy fish, he would just catch a fish, down the Lachlan here, always four to five cod and not much of anything else, that's what dad used to tell us. There was also what they used to call the old black bream; they used to call them white eyes here, now they call them Macquarie perch, and the trout.

When I was about 8, I went with me brother fishing down to the river down from Moorabinda to a hole called Evan's Hole, it was on Jessmondeen. We got the humpy back - that was another common name for the Macquarie perch, and goggle eyes I've heard of that, the ordinary silver bream or grunter and rainbow trout. We got so many fish we had to bring some ahead a mile or so and go back and get the second load. We did that all the way home, we made three stops. When we got home we got the biggest hiding - that was for going down the river by ourselves. The neighbours came and got what fish they wanted for Easter.

The rock cod and the green back - that was the old common names for the two types of cod here in the Lachlan. An uncle of mine, his father was a keen fisherman. He said there was a distinct difference in the types of cod. What I remember they mostly talked about was the pointy nose, they were spotty, and they always said that most of the cod they caught in the early days were the spotty ones. I particularly remember a couple of uncles over at Taralga and they used to talk about the rock cod. They said they used to get a few rock cod and also said that they used to get the odd greenback, over at Taralga. They always used to talk about the white eye; they caught a lot of them, a lot of trout, mostly rainbows, and the yellowbelly. They used to get the old silver bream, but they weren't really plentiful there. The cod you might get one each trip, if you were lucky, only small stuff, anything from 2 pound to 6 to 8 pound. That's what they said. The stories I heard are going back to the 1920's. To me they were just all cod; I can't be sure what type I was catching.

In my lifetime, what I remember of them, the cod never went much past Reidsdale, but the old stories were that Reidsdale was one of the best cod areas around here. There was deep water, but it's all silted up now. I can remember the cod in the Lachlan; we used to catch some at Jessmondeen, from there up to Reidsdale, just upstream from the Lachlan Bridge. We caught quite a number, they were not real big, they were around thirty pound. I remember in 1952 I seen one hooked up on a fence post in the 52 flood, he was over a hundred pound. There was a photo taken of it. The last I remember they were big and fat, that was the tail end of them. Never caught little ones out of the Lachlan yet. I wouldn't say they weren't common when I fished. Probably around the fifties was when we were getting them. My uncle got one in 1958; he was about 17 pound, that was the last one I saw.

The Crookwell River was one of the best bream spots around; we used to go down there as kids. Moorabinda, the Kensits owned it, we used to go down there with a little Stringybark rod and six foot of line, we'd catch six to eight bream and they'd be good ones, two to three pounds. That's the Macquarie perch. The bream used to go nearly all the way to Crookwell, there was a bit of a fall just below the town, they were certainly caught there. In the Lachlan the Macquaries were caught all the way up, certainly at the Poplar Hole, that's where the Narrawa Creek comes in. They used to be up in the Jerrewa Creek, that's actually Spring Creek, the last I remember them there was the late 60's.

The Catfish, my dad said, he said there was only odd ones here early on, they didn't come here in any numbers till the 1950's. The Catfish they used to come right through from Forbes, and the yellowbelly, they used to get an odd one, very, very early on. With the old dam they could get round it in a big flood. I've never caught a Catfish further up then Reidsdale, they preferred the muddy holes. Above Reidsdale there was a fairly steep rapid. Yellowbelly, again very odd ones, grunter or silver bream, yes there was quite a few of them here, they went all the way up too, you could catch them anywhere there was a sandy bank. The bluegut was always plentiful. Every creek, they were just about everywhere, they were very plentiful. The rainbow trout was the most common, right through, and the old hands used to be saying they used to catch a lot in the depression era. Not a lot of browns. The trout, they more or less stopped above Reids Flat. It was after the 56 flood that a lot was caught further down, a lot of browns.

The smaller fish, well there was the smelt, and gudgeons, three types of them. One was the purple spot, there's still odd colonies of them around here in the small creeks. One place is the Burrawinda Creek. I've seen them there six to eight inches long; they're big ones, with a lot four to five inches long, some two to three inches. The other gudgeons were nearly clear and a lot smaller, 50 mm would pull them up. In 1980/81 I caught two fish which I think were perchlets, just down here. Got them under a float on worms, never seen them before. I suppose they were about eight inches long, they were a transparent blue colour, with a bit of a pink background in them. That was down in Evan's Hole. I read later about a new perchlet they discovered over at Hillston, so it might have been them.

The Macquarie perch started to drop off in the 60's and by the time the big fire had come through in 75 they had disappeared in most areas. The bluegut disappeared too. In the Lost River, it runs into the Lachlan, there's still blueguts in it, odd ones. I know of two that were caught in it a while back. From the 60's onwards we had quite a few droughts. The first carp that I know from around here was in 1968. When I was young the river was deep, clear, there was no debris in it, a lot of it was rock out in the deep water, and sand on the bends. The changes have happened a lot since the early 70's; I put it down to the drought of 65. There was grass about, then there was a lot of heavy rain, washed all the topsoil off. Sandbanks appeared in certain holes, and every year they've increased, going up the river all the time. It used to a nice clean green colour and now it's murky all the time. The local people have been fencing the banks off in places and there's natural regrowth. From what I've seen the changes have made a fairly big difference, and I think the government should help them more. Where the stock have been kept out when it rains the sand gets scoured out and doesn't work its way back in again.

OH 29

Mrs Mona Motum of Tanilba Bay was interviewed in February 2007 at an age of nearly 92 years.

I'll be 92 in September; I grew up at Reids Flat, on the Lachlan River. My father come from around Bigga, my mother herself was from Reids Flat, so we were all from around there. When I was young we fished and caught nice fish, we always had nice fish, there was plenty of fish in the Lachlan. I remember mum said one afternoon to us kids, that we were going down to the river fishing, I was about 6 or 7 years old. There were no rods or reels; we just had a pine fishing rod with a chord, float, sinker and a hook. We went over to the river, we sat down and fished where there were three logs and put worms on the hook. In no time we had three beautiful cod, they were about 2 to 3 pound. We went back home then, that was enough for us, there were no refrigerators back then to keep them.

The 3 cod that we caught were the streamlined cod. We used to catch two types of cod, the streamlined cod and the stumpy cod, but really they were all cod to me. The streamlined cod were more common than the stumpy ones, they had a pointy head and it wasn't as big or flat like the head of the stumpy ones. They were different in colour too, though it's been years since I have seen one. The streamlined cod they were a grey sort

of colour, while the fat ones were a darker colour and green. And the streamlined ones didn't have the fat in them like the stumpy ones, they were better to eat. But really both were beautiful to eat. With the fat ones my mother would fry them, then cook them in the oven over a pan, that took all the fat out of them.

Most of the cod were a nice size to eat, though some of the cod were bigger. After a flood, at the racecourse above the bridge, the flood used to wash them out onto the racecourse. My father and uncle used to pick them up and put them back in the river, there were some mighty ones they put back. They looked after the cod; we only took what we needed. But then there was a bad fire, it nearly burnt us out, they stopped it at Bakers Creek, it happened well before the war. And before that there were two blokes who were dynamiting the river. The cod used to float up for days after, we couldn't stand the smell, it cleaned out a lot of the fish. After that there were very few cod seen out of the river.

Apart from the cod we used to get at Reids Flat the yellowbelly, they were a good size, and the bream, they were a good size too. One fish was a feed. The bream were a lot more common, they used to swim around in schools, you could sit on the bank and watch them. The bluebellies, you could catch them all the time. A cousin of mine, Bill Norris, he was like my brother to me and I was like a sister to him. He used to catch them, they'd be 6 to 8 inches long, little slimy things, they were called slipperies too. They were as common as can be, you'd get 3 to 4 every time, then they disappeared overnight. It was the same further up the river, on the farm up at Battery Crossing, a few miles above Reids Flat. There were the same sorts of fish; it was no bother catching them, bream, yellowbelly, bluebellies and both cods.

In Wyangala Dam there was plenty of cod, bream and yellowbelly when I was young. There was grunter too, oh yes, they were in Wyangala, in the dam you didn't have any trouble catching them, but I never saw one in the river at Reids Flat. And the Catfish, you could catch them easy. I remember one day later on we went down to Wyangala, my husband and I, and we weren't catching anything. It got dark and we had our lines out. I shone a torch and they were right in front of us where we were fishing, not out where we had our lines. We threw out our lines in front of us and we caught a lot. I don't remember catching one at Reids Flat.

After the fires and the dynamiting I used to go down the river once a week with handlines and worms, by then there was only bream. When I became a teenager I left Reids Flat, went to Sydney. You could still catch a bream, over 20 years ago. Then they put the trout in and they started to die out. I haven't been back permanently to the area and I don't go back today. It's not the same place.

OH 30

Dick Elvins of Lemon Tree Passage was interviewed in February 2007 at an age of 62 years.

The cod in the upper Lachlan, that is from the top end of Wyangala Dam and up, were something of a mystery. I can recall as far back as 1952. There were a lot of tales around about the cod that used to be caught in the river in previous years. Some of these were caught by my grandfather, his sons and daughters, one of which is my mother who is alive today at the age of 92 and has clear recollections of the fish that inhabited the river system.

My grandfather had a property on the Lachlan above Reids Flat, he had about twenty odd miles of river front, I didn't live far from him. His main residence though was at Reids Flat. He and my uncles used to come home on weekends if it wasn't flooded. He used to talk about how in the past how he used to catch there Catfish, yellowbelly, Murray cod, the Macquarie perch and the blueguts or slimmies. He said he used to be able to catch a cod or a yellowbelly anytime. His best cod was 80 pound, though he got plenty over 40 and lots of smaller ones. My grandfather used to take me fishing a lot in my younger years; he used to live about half a mile from the river. We used to walk along the Lachlan and he used to show me the holes where he used to get the cod.

He would take his pole with a line attached, pole usually being about a 10 to 12 foot long Stringybark sapling, with a line the same length and a cork on the line. It used to astound me how he could tell the difference of a bite from a shrimp to the bite of a Macquarie perch or black bream as we called them.

We would sit on the bank at the Reedy Hole and while he fished he would tell me about the fish he used to catch there. The cod were in plentiful supply back then. He would and had caught them up to 80 pounds; the biggest was caught just above where we were fishing. Back then and until just recently we all thought they were Murray cod, but when I think about it both he and my mother said that the long thin cod were better eating the short fatter ones. Obviously the thinner ones could have been Trout cod. The first time I had heard of the Trout cod was back in the late fifties when me, my father, grandfather and uncles were fishing in Burrinjuck Dam and my father caught a cod of about 30 pounds. It fought and looked a bit different from the other cod, that was in late 58 or 59. My grandfather knew all about the Trout cod or bluenose. He said it was a Trout cod and was great eating as they were not as fatty, but said they liked the faster flowing water, to live in. And they go a lot harder than the normal Murray cod. Mum told me that after the big floods my grandfather and his brothers would go along the river and get all the big cod caught in the gilguys and billabongs and return them to the river. She said it was silly trying to keep them because they had no refrigeration and the fish would go bad.

I have not fished in the Abercrombie as I have the Lachlan. I do know that the black bream used to be more prevalent there than the other streams, that was because it was a faster flowing river with plenty of rocky holes. Back in the gold rush days around Tuena most of the miners lived on rabbits and fish. From what my grandfather said his brother, who was on the goldfields, said that there was good cod and bream in the river. I do know that back in the late 40's and early 50's, even as late as the sixties they used to get bream in Tuena Creek, but I think it only has trout in it now. The old blokes talked about the cod and Silver perch being common up from Bathurst in the early years. And the top of the 'bidgee, they used to get cod up from Canberra. My grandfather had a mate that used to fish the 'bidgee up from there for cod.

Anyway back to the type of fish that were caught in the river system. There was no shortage of black bream, cod, slipperies, Crucian carp and Catfish. I can recall my grandfather coming home one afternoon in the mid-sixties and telling us that he was astounded. While he was fishing down at a hole known as the Green Bank that afternoon, he walked onto the top of the bank and there were three yellowbelly sunning themselves on the surface. He swore that they had to be over 30 pounds each. So my father and I went down about a week later to see if we could catch one. We were using yabbies and worms and we set four handlines along the bank one of which was beside a log about twenty feet from us, as we were bobbing with worms. As we were sitting there we heard a whack near the log. We went there and the line had been shattered. The lines were all 45 pound breaking strain that was because my father always said you never know what you are going to hook when fishing. But I don't think it was a yellowbelly that broke it.

In the early 50s in the afternoon you could go down to the river and catch half a dozen Macquaries, not a problem, that would be our fish for the week. We used to get them up to three, three-and- a- half pound. And the Catfish, well the dam was full of them, but you would get one occasionally, up to about 3 pound, maybe one every six month at Reids Flat. Another good place to fish was Taylors Creek as we knew it, above Reids Flat, but its real name was Kallaba Creek. It was the home of the black bream and was one of our favourite creeks for Maccas, the holes were 7 to 8 feet deep, in between the rapids, they were in all the creeks as well as the river. You could look in the holes and see the Macquarie perch, mum, dad, and all the kids swimming around the hole. My father and mother used to take us fishing there when we were kids. It was quite common to catch anything up to a dozen bream.

It would have been in the late seventies when my cousin Phillip Roberts and myself were at the hole above Green Bank known as the Pumpkin Paddock. We had been shooting ducks further up the river and came back to the car to pluck them. As we sat on the bank of the river there was an almighty splash and bang under a willow tree on the other side. This poor old wood duck came out honking, feathers going everywhere and had an injured wing and could not fly. Although she could see us she preferred to be over our side as over there. A couple of minutes later as we were watching the Willow a cod swam out from under it. You could actually see his fin sticking out of the water; he would have to have been well over a meter in length. He swam about half way across and then disappeared, that was the first one I had actually seen there.

I often fished the Reedy Hole and Supples, but it was such a long walk from my grandfather's farm house, but I still used to do it. It was about six or seven k's to Reedy Hole from the farm house. Supples and Hogans holes were another of my grandfather's favourite fishing holes as well as my own. He used to catch cod and bream, but all I caught was trout and the occasional bream. One of the best streams for bream was used to be Mulgowrie Creek. We used to walk up above Rosewood Station and watch the bream swimming around in the rocky holes, but we never ever caught any as we thought it was probably the only stronghold they had left. As far as I know they should still be there, unless someone has got them. The only thing I used to take out of there was the bloody trout. It is probably full of European carp by now which is a shame. They, like the trout, have caused a lot of damage to our native species. Take the bluegut or slippery for instance, the last one of those I caught was in 58 or 59. I blame the trout for their demise. They were there like the bream before the trout but did not last long after they arrived.

There were other creeks around that contained good stocks of bream in those days, such as Bramah Creek, Mulgowrie Creek and the Crookwell River. I don't know much about the Crookwell River as it was a bit past my fishing grounds. But I fished the Lachlan from Wyangala Dam to what we know as Sounding Rock just below the entrance of the Crookwell River. The only time that I have fished above Sounding Rock was once with my grandfather and uncle. We were fishing up above the junction of the Crookwell River at a place called Fords Crossing above Koala Station towards Rugby. That would have been in the late fifties or early sixties. We had gone there to catch bream; it was beautiful water, deep with lots of logs. That night we heard four big wallops, my grandfather told me it was a cod feeding. He and my uncles always said that they thought that there was still cod at the Sounding Rock, at that time parts of the hole were very deep and so was the deep hole just below it.

Another river known as the Boorowa River used to hold yellowbelly and cod back in the fifties. I can recall once when my father and a farmer who lived at Frogmore, he owned the land around Roaring Rock which is a series of deep granite holes. I was only about 8 or 9 years old when we went up there for the weekend, mum and us kids stayed at the house for the weekend. Saturday night dad and Eric came home from down at the river and had half a dozen nice yellowbelly, the biggest being around 8 pounds. Next morning they went around their lines and came back with a few more yellowbelly and two bream. Dad was saying that they had two lines broken through the night. As I said before my father never fished lighter than 45 lb. line. After that time it was only good for trout fishing further up.

Wyangala Dam has gone through several stages. Back in the 50s and 60s it was full of Catfish and bream. We used to call them white eyes or pygmy bream, but they were actually baby Maccas. Then, when the trout and the carp built up numbers, they disappeared. Gone from can't keep a bait on because of small Catfish and bream, to not losing a bait, or catch a carp. On one occasion while they were working on raising the wall at Wyangala I recall watching with a couple of workmates a very large cod which used to patrol one certain stretch of a bay every day about the same time. He did this for about three days and then we did not see him anymore. He would have been 80 pounds or more, that was back about 63 or 64. So there was obviously still

some cod still around in the dam. But they were obviously not breeding or if they were they were not surviving. I do recall that the Bigga Fishing Club along with the fisheries stocked it with big cod caught at Burrinjuck; it was in the late 70s I think. Just how many I am not sure.

The only time I caught a cod from the Lachlan was back in 1982 when I landed a 56 pound fish were the river met the backwater of the dam. At that stage there were no carp in the system. I went back four months later and I caught a European carp in the river just above the headwaters of the dam at what we called George Smith's and it weighed in at sixteen pounds and was full of roe. Twelve months later the system was full of carp. The last cod caught in the river to my knowledge was caught just below Reids Flat by my cousin Phillip Roberts. Since then my cousin has found three breeding pairs above that and protects them. He has vowed never to keep another big fish after that one. He also told me that one of Tony Taylor's sons was spinning for trout just below the bridge last year and a couple of cod around 20 pound followed his celta in.

The tales told and from some of my experiences seems to lead to the fact that that a lot of the demise of the bulk of the fish types in the upper Lachlan and for that matter the Abercrombie was caused mainly by bushfires and man himself along with trout and European carp. My mother told me that there were thousands of fish killed and left to rot by indiscriminate dynamiting of the holes in the rivers, the bulk of it by two men in particular. She said for weeks after they did it you could not get near the river because of the stink of dead fish. These holes would have taken years to rehabilitate.

Grandfather told me there was a massive fire in the upper Lachlan in the late 30s or early 40s; it started over near Rugby and burnt across through to Crookwell before they got it under control. About a week later it rained and brought in all the ash into the river, then it flooded. He told me the floods washed all of the bodies away, the cod were getting washed up and hung up on the fence at the old Reids Flat racecourse. The fire pretty well wiped the cod out, though I may have heard of odd ones around there, maybe up to the 60's, but I never saw one myself. My grandfather thought that some had survived, in the creeks above where the fire went through. I remember we were fishing one night, up above Rugby, and there were four big wallops, my grandfather told me that it was a cod feeding, that was back in the early 60s. The Macquaries and the blueguts had survived in some of the creeks away from the fire, and they later came back.

The trout first hit Reids Flat about 55/56, they were a bit like the European carp today; they had just been put in. They went up every creek, every pot hole, they grew fantastic. Well that was the end for the other fish. I can remember the first time I caught a rainbow trout, I was 12 years old. We went to Taylor's Creek fishing for bream and we ended up catching about thirty "bloody trout" as my father said. He said it would be the end of the fishing there, and he was right. I fished that stream for several years after and only caught one bream, while I must have caught 200 trout. Gone were the days of watching the bream swim around. It was amazing to watch how they swam around as a family group. I sat and watched one group for two hours one day and it was amazing how mum and dad herded the troupe up. One little hint of danger and the little ones would dive under the bank, then mum and dad would come out, swim around, and if all clear out would come the littlies and either mum or dad at the rear. I actually saw one of the old ones catch a shrimp and break it up. All the little ones came around and feasted on the scraps. Alas gone are those days.

And the same with the blueguts, I was told they used to be really common, that they were a great bait for the cod. We used to still get them when we were kids, a few a month, then the trout picked them off. The blueguts have been wiped out for years, since the late 50s, the last one I saw would have been in 58 or 59. I know there still are a few Macquaries in the Abercrombie but the only place I've seen them doing well in recent times is in Cataract, and the Silver perch there's heaps of them in there, as well as Murray cod and Trout cod. The native

fish have got it all to themselves in Cataract, there's no trout, redfin or carp and they're doing really well. That's how it should be.

OH 31

Eric 'Sugar' Beer of Wyangala Dam was interviewed in January 2007 at an age of 70 years.

I was reared on the upper Lachlan; the old people called it the Fish River. There was two stories I was told about the cod in the river here, up above the dam. A big bushfire went through, before my time, above Rugby. They reckon there was that much charcoal washed in the river, well the gases killed them. The other theory was that they got a gill bug, and that killed them. When that happened, what killed them, they said you could nearly walk across the river on the cod. They told me that when I was a kid, 60 years ago. There was supposed to have been cod in the Abercrombie, there had to have been. The first cod I saw up here was 49 pounds, out of Wyangala, in the old dam. They finished the dam in 32 or 33, and I was 10 or 12 years old when I saw the cod. The dam was increased in the sixties. I didn't see another cod until they stocked them. The Bigga Fishing Club put them in, and then the Wyangala Club put more in, I was the President of the Wyangala Club. The Bigga Club went to Burrinjuck and netted some cod, they had permission, and brought them back, that was the early to mid-70s. Then we bought fingerlings over from Narrandera, not long after.

I used to catch a lot of Macquaries over at Reids Flat, they were still up there till about 55, though not that many by then, they were starting to reduce in number. The Macquarie perch, my stepfather used to catch the buggers there, plenty, from ¾ to 1½ pound. Anything bigger was exceptional. I blame the trout for wiping the Macquaries out. They put the trout in, well within a couple of years you could see the change, the Macquaries got real scarce. We still get an odd little Macquarie in the Abercrombie Arm of the lake. Speaking for myself, before the trout, Macquarie perch were the dominant fish, and the freshwater Blackfish which we called the 'blueguts'.

The last I seen of the Blackfish was in the creeks up near Rugby, they were common, they called them 'sprats' up there. Those creeks, they had stacks of them, 8 – 9 inches long, I was 15 to 16 at the time. You are looking at about 1952. They were apparently the ideal cod bait up there; they told me in the old days you had to stand behind a tree when you put them on the hook! I don't know of them up there now. I heard of one from below the dam, I didn't see it but it was positively identified, would have been over 20 years ago.

There used to be nice little holes at Reids Flat, 300 to 400 yards long, 6 to 8 feet deep, that's when the river was low. And then the 50 and 52 floods virtually levelled it, two whopping floods. I didn't see a redfin until I got out to Bland Creek, that was my first, near West Wyalong. I've never seen one above the dam, heard of them but seen no proof, but there used to be plenty of them below the wall.

OH 32

Arthur (Tibby) Flint of Cowra was interviewed in January 2008 at an age of 82 years.

I will be 82 this year. I'm only a boy really and still go to work on the farm which is 14 kilometres up the Lachlan River from town. When I was very young I can remember a section of the river, about three kilometres up from the town, being a very popular fishing spot. This was known as the second sand bank, and swimming carnivals were also held there. My father, friends old Digger Wright, Bill Slattery and many other fishermen they would line up on Sundays, sometimes on a Saturday, with their Rangoon cane poles and a tin of worms. There would be a line of fishermen for about three kilometres and they would mostly all finish up catching fish. They caught cod, slipperies, and yellowbelly which were common.

My father-in-law, Bill Byrnes, used to fish the 'narrow gutted hole', right where they built the dam. There were very many small cod in the river at that time. The first time I caught a Macquarie perch was above Wyangala. I have also caught them in the Lachlan above the second sand banks. Their size would have been approximately one and a half to two pounds. They were certainly caught in the river near Cowra, but not in abundance. They were not as common as the yellowbelly, small bream or grunter. I haven't known of any here in the last twenty five years, but I haven't fished this portion of the river much for many years.

Catfish were very common here, but they were more plentiful about 25 kilometres up the river. We caught them mainly at night with worms. A good sized one would have been about two pounds. During the last forty years I've fished mainly in Wyangala Dam and the river below and caught Catfish in both areas. Yellowbelly weighing a pound to a pound and a half were also caught there. I have seen some good ones, the biggest being about twelve pounds. Seven to eight pound cod were caught by the old blokes especially after a fresh in the river. The cod went right up the Lachlan.

I knew there were two types of cod. The old blokes had names for them, but I can't remember what they were. They couldn't understand why they were different. To my knowledge they only caught a few of the other type, odd ones at Cowra, but they caught both types in the river above Wyangala Dam. The grey ones had a beak or a hooked nose on them, and they were common in that area. Macquarie perch were also common up there too, in the Abercrombie, around Tuena. They also caught some Murray cod, but more of the other, that's what the old blokes used to say. The old blokes used to talk about how it was before the fires. The fires wiped them out for many, many years. An old bloke at Reids Flat told me how the fire went through, and a storm washed the ash in. This killed thousands of fish which were washed up on the bank. I am not sure of the exact time of the fires, I'd say it was in the twenties, it was well before 1939 and it specifically wiped out the cod in the rivers.

In the late 1920's, early 30's, they built the first Wyangala Dam. I can remember my father and mother going to hospital to visit a relative. He was one of my mother's brothers. He died eight days after being caught in a concrete mixer while working on the dam. I fished the dam in the late 30's and I've seen it down to the river bed. In the first dam there were cod, grunter, slipperies, yellowbelly, bream and Catfish. They caught a lot of Catfish but more cod than anything. A lot of people wouldn't eat them, the Catfish but they were beautiful. The bream and the Macquarie perch was the best eating. Cod has always been too fatty for me.

The dam has changed a lot. In the 1940's there weren't many cod or yellowbelly being caught in the dam. A few bream and Macquarie perch were being caught in the 1950's. After the trout came in there were no other native fish other than the Catfish and grunters. My father-in-law ran a few competitions for the Lions Club in the late 50's. Mainly trout and Catfish were caught. I remember the last time he ran one the new wall was under construction. Redfin came into the Lachlan after a big flood in the 1950's. They were plentiful for about ten years. They did well until the carp arrived.

In the 60's we stocked the dam with yellowbelly, we brought over from Bland Creek. It was done by the Cowra Angling Club who and supervised by the Fisheries Department. It was done over two weekends, on one occasion 300 went in. In the 70's cod were brought over from Burrinjuck, then fingerlings from Narrandera. Below the dam the river has changed, it's silted up; towards the town part it's really silted.

OH 33

John Bryan of Cowra was interviewed in January 2007 at an age of 79 years.

My father owned 'Glenogen', about 7 miles out of Cowra and I was up at Bennet Springs 40 years ago. I have never seen one, a cod, out of the Lachlan at Cowra. They were here over 80 years ago, my father caught a big cod, dragged it onto a sandbank about 1910. I remember him telling me how this cod was gasping and the

boys were frightened by the mouth! He said they used to catch Yellowbelly, grunter. There's always been a fair bit of yellowbelly about.

OH 34

Neil Cambell of Canowindra was interviewed in February 2008 at an age of 70 years.

I'm seventy, and yes I did have some Macquarie perch in my dam years ago, they came from over at Wyangala. I also had some yellowbelly in the dam; they grew to a fair size. The Macquarie perch they might have got to a pound, pound and a half, that was back in the mid-sixties. I can remember my father and the old blokes used to talk about the good cod fishing there used to be up in the top of the Lachlan before the big bushfires. In the Lachlan near here the Macquarie perch there was the odd one caught below Cowra. There used to be a lot of cod, Grove Craven and my father used to get a lot.

In the Belubula I can go back to the mid-sixties and at that time there was a lot of rainbow trout in it. A mate and I we once walked down about a mile and a half below the bridge and we caught eleven rainbow trout plus all those that got away - we were burying them in the sand as we went. I've caught years ago Golden perch, the odd one in it, not far from the Lachlan. And I did catch a couple of cod, they were coming up out of the Lachlan, one was eight to nine pound.

There was a couple of blokes here that caught a couple of Trout cod, between Cowra and Forbes but I'd say closer to Forbes as I remember. It was a long time ago, in the sixties, no later than about 1970. They were not very big, only a couple of pound, they weren't sure what they were, they brought them back to get them identified, but one of the blokes at the time said he thought they might have been Trout cod and that's what they were identified as. That's what they were and they're the only ones I've ever seen out of the Lachlan.

OH 35

Grove Craven of Canowindra was interviewed in February 2008.

The Macquarie perch: many years ago we went up to Wyangala just after it opened and we used to catch them up there; we called them the pygmy perch. I can't recall catching them in the Lachlan; we used to do a lot of fishing down below Euabalong, in the lower reaches round Lake Cargellico. The main fish there were the old yellowbelly or Golden perch, the odd Silver perch and the Murray cod. There were some good Golden perch down there, but no Macquarie perch. There was plenty of Catfish in the lower Lachlan, and there was times when Wyangala was full of them. My old man was a keen old fisherman, he'd always fish for big fish, and he'd use frogs and sparrows for the cod. We got an invitation to go to Euabalong and dad got a forty five pounder and his mate an eighteen pounder. On that trip down there, that was my first trip there, the bream were breaking my light lines, and the yellowbelly.

In the Belubula, well the only fish that did any good there was the rainbow trout and that was only in some years that were suitable, when it was cooler. The Belubula hasn't reached the Lachlan now for months, and in the past it was only in good years that you could fish it. The Lachlan near here wasn't too bad, but there was too much fishing going on, you had to go below Condobolin to get good fishing. The buggers all had traps in; I was a fisheries inspector for seven to eight years. I once asked one old aboriginal bloke about why they got so many big cod in their traps. He told me they used to put a bag over the top of it and the cod thinking it was a log would move into it. There was a time when I was a teenager and you'd catch a few of the smaller cod in the Lachlan near here. We also used to catch the slipperies, we'd catch them under a float with worms, and they were commonly about six inches long, they were very sweet to eat. That's about thirteen mile from Canowindra, they were common for a time, the last time I saw one would have been ten or fifteen years ago.

Our great fishing places were Wyangala and Burrinjuck. Burrinjuck was originally terrific for cod; we could always catch six to eight cod there in the forties. The first time I ever fished it was in 1932 and from that trip I'm the only bloke left alive, I'm ninety five and a quarter years. We went there and there was two blokes that really knew how to fish for them, they were bushrangers! There was a lot of cod, and the Silver perch and some of the Macquarie or pygmy perch. In particular the Macquarie perch there was a lot of them in the upper reaches of the dam and up the rivers. That was the bushranger days; some blokes would have a mile of crosslines. That was the last year you could actually use net, they were still legal. I can tell you one place where I struck the Macquarie perch. We struck them this one day over in the Goodradigbee, beautiful fish, three quarters of a pound to a pound; I think I caught them on worms. They are beautiful to eat though I think the old cod takes some beating.

With the droughts, well the worst one was the terrible drought in 1944, the river nearly went dry. The following year there was fifty two inches of rain, it tore the wonderful Lucerne paddocks we had apart, at one stage we got eleven inches in a week.

OH 36

Tom Cussack of Wellington was interviewed in May 2008 at an age of 82 years.

I'm 82, grew up in Parkes. Joycee, that's the wife, we've been fishing the Lachlan, the Macquarie and the Darling for a long time. The brother in law, Robert Smith, they'd come with us. Fifty years ago I used to fish the Lachlan, past Condobolin at a place called the Blackfella's Monument. We used to get a lot of yellowbelly there, and Murray cod. We also used to get a lot of Catfish and the grunter too. When the carp came about they ate up all the weeds, and you saw the change. The yellowbelly it would be nothing to get 4 to 5 pounders, the biggest we caught was at Euabalong, 14 pound was the biggest. The wife got two in one day 14 pound. The biggest cod I ever got was 61 pound dressed, it was a female. We used to throw the big males back because they look after the young. Others threw the females back, but we threw the males back because they're important. We used to keep the cod at about 10 to 14 pound, but we got a lot around 2 to 4 pound. I remember I once put a line out with milky worms and there was a cod on it about three quarters of a pound. When I pulled the line in a bigger one about 4 pound had grabbed him, I knew because he had the smaller one in him. The grunter were mostly a pound, pound and a quarter, and the Catfish were up to 6 pound. I never ever saw a Trout cod there, in the Lachlan, though there is a few here now in Wellington. I never ran into Macquarie perch there either.

We used to fish in the Macquarie; we used to go up to Carter's property near Warren. It was pretty well the same there; we got yellowbelly, Catfish, cod, the whole works. And the Silver perch I remember we used to get them up to 3 pound back in the 1950's. We were up near Warren, 3 to 4 years ago, we used to go fishing up there a lot. There was a dead cow near the river, and I said to the wife that we'll camp here, she wasn't too happy about it. We fished there for a day and got a couple of small ones. Next day it rained and I had a cod line with two sets of yellowbelly heads. Wayne, the number one son, went around the lines. I straddled two logs and brought him up, he was a 43 pound cod and he wasn't even hooked. Many years ago the Lachlan was good and the Macquarie was good too. We were down at a place called Waroo, down towards Condobolin. Joyce threw the first line in and got a 4 pound yellowbelly straight away. We never saw another fish for a couple of days. That's what they were like sometimes. The yellowbelly we got mainly on milky worms and yabbies and the big cod I've caught mainly on yellowbelly heads and guts. The Catfish and Silver perch we mainly got on worms.

19 Murrumbidgee River Catchment

STOCKING THE BARREN JACK DAMS.

TO THE EDITOR OF THE HERALD.

Sir,—A short time since a paragraph appeared in the "Herald" re stocking the dams at Barren Jack with economic fish, i.e., cod, perch, etc. A request was sent to the Fishery Department to take the matter in hand, and an expert was detailed to carry out the suggestion. This expert's idea was to capture fish in the reaches of the Lower Murrumbidgee, and transplant them to the said dam. Instead of so doing it will be far better to permit the dams to be stocked by or with the fish that are in thousands above the dam. They are precisely of the same species as will be obtained from the stretches of the same river lower down.

The young fish that are in the waters above the dams will be sure to make for the deeper waters; it is their natural habit—the larger and deeper the waterholes in rivers the larger its fish inhabitants.

The writer has seen young perch and codfish in the Murrumbidgee and its tributaries near Cooma by the thousand. Then why take the trouble and go to the expense to take fish from one part of the river, and dump them down among the same species in another part of the same river? "Coals to Newcastle" again

The great flood that occurred two or three months ago in the upper parts of the Murrumbidgee gave ample proof that the codfish, etc., grow as large in the Gundagai district as in the lower parts of the said river. Tons of these fish, weighing up to 60lb or 80lb, were left to die on the mud flats for miles along the river banks. Such fish will be sure to find their way down to the Barren Jack dam if they have not already done so.

I am, etc.,

COOMA FISHERMAN.

Sydney Morning Herald, 10 March 1915

STOCKING THE BARREN JACK DAMS

TO THE EDITOR OF THE HERALD

Sir, - A short time since a paragraph appeared in the "Herald" re stocking the dams at Barren Jack with economic fish, i.e. cod, perch etc. A request was sent to the Fishery Department to take the matter in hand, and an expert was detailed to carry out the suggestion. This expert's idea was to capture fish in the reaches of the Lower Murrumbidgee, and transplant them to the said dam. Instead of so doing it will be far better to permit the dams to be stocked by or with the fish that are in thousands above the dam. They are precisely of the same species as will be obtained from the stretches of the same river lower down.

The young fish that are in the waters above the dams will be sure to make for the deeper waters: it is their natural habitat – the larger and deeper the waterholes in rivers the larger its fish inhabitants.

The writer has seen young perch and cod-fish in the Murrumbidgee and its tributaries near Cooma by the thousand. Then why take the trouble and go to the expense to take fish from one part of the river, and dump them down among the same species in another part of the same river? "Coals to Newcastle" again.

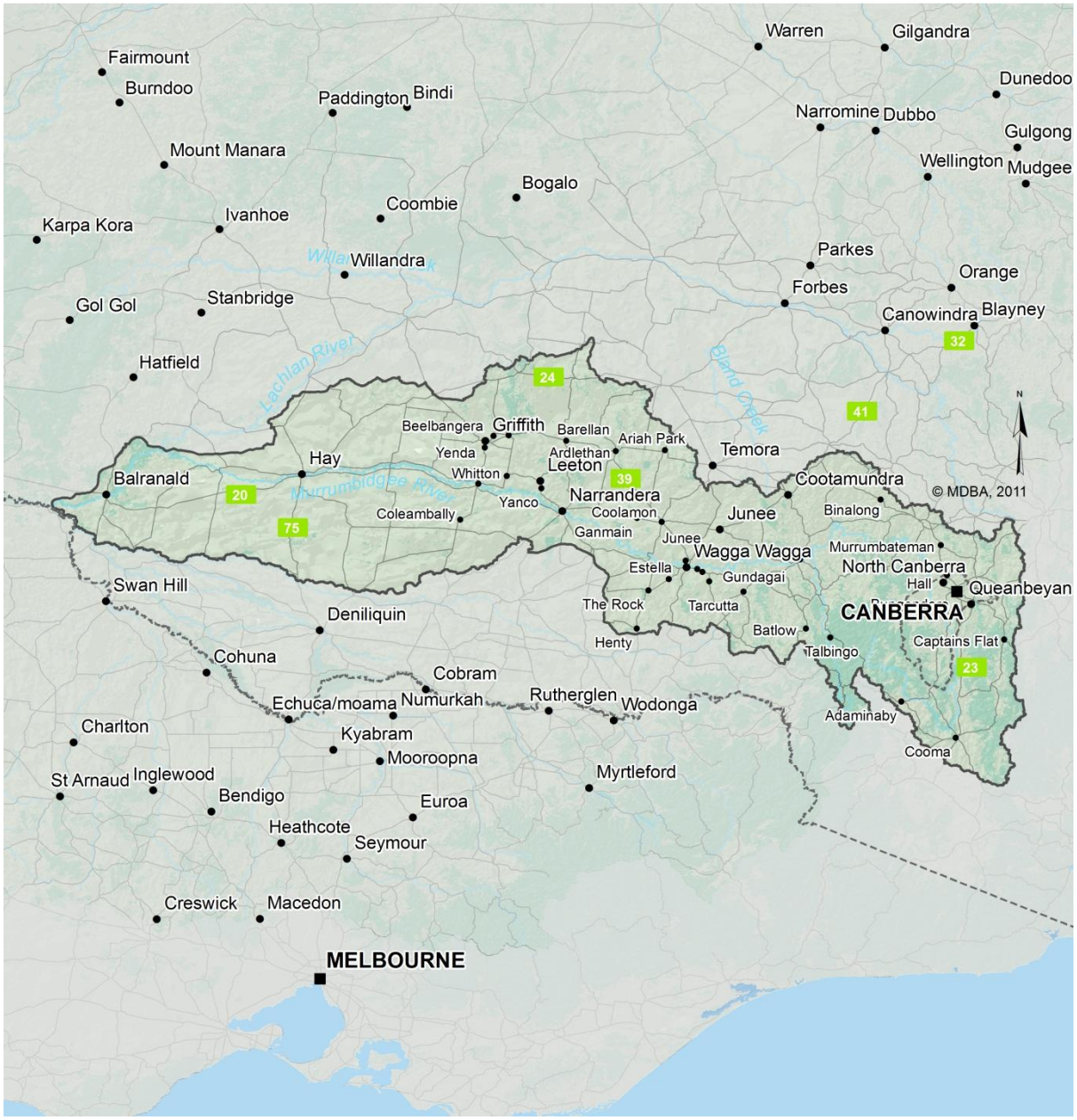
The great flood that occurred two or three months ago in the upper parts of the Murrumbidgee gave ample proof that the codfish etc. grow as large in the Gundagai district as in the lower part of the river. Tons of these fish, weighing up to 60lb to 80lb were left to die on the mud flats for miles along the river banks. Such fish will be sure to find their way down to the Barren Jack dam if they have not already done so.

I am. Etc.

COOMA FISHERMAN

Sydney Morning Herald, 10 March 1915

Figure 19.1 The Murrumbidgee River Catchment showing major waterways and key localities



19.1 Early European Accounts

Evidence provided in newspaper correspondence by historian Mary Gilmore, whose image features on the Australian ten dollar note, indicates that Aboriginal people constructed large numbers of elaborate fish traps in the Murrumbidgee catchment (*Sydney Morning Herald,* 8 November 1933). The smallest were formed by placing tree limbs across gullies carrying ephemeral creeks. This created permanent ponds which supplied both fish and water. Single gullies, in some instances, had dozens of these ponds. Larger wooden structures were also built across billabongs. Stone traps similar to those that still exist near Brewarrina were also constructed, employing the use of removable key stones to regulate fish passage and stream flow. A stone trap between Narrandera and Hay was the focus of large gatherings, and other such traps existed, including one in the upper Murrumbidgee. The wooden fish traps were destroyed by Europeans who used them for firewood, the last disappearing in 1880, while the stone traps were dismantled and used for building hearths (*Sydney Morning Herald,* 8 November 1933). The remains of one stone trap still exist in the Murrumbidgee River (Mac Hardie, pers. com.).

European exploration of the upper Murrumbidgee area commenced in October 1820 after aboriginal people reported the existence of a very long river called the 'Mur-rum-bid-gee' meaning 'big water' (Lea-Scarlett, 1972). Charles Throsby, accompanied by Joseph Wild and James Meehan, explored south of Gunning to a river known as 'Boongaroon', now named the Yass River. In December 1820, a second expedition ventured to the Yass River near Gundaroo, and the party 'caught 5 fish like the Bathurst fish' suggesting that they had caught cod. Further 'Bathurst fish' were caught the following day (Smith, 1820). On the 8th of December, the expedition reached a river named by the aboriginal people 'Yeal-am-bid-gie', now known as the Molonglo, before returning to Lake George. Charles Throsby is considered to be the first European to sight the Murrumbidgee just downstream of its junction with the Molonglo River during a later foray into the catchment in March 1821 (Lea-Scarlett, 1972).

William Kearns camped on the Queanbeyan River in 1822 and recorded in his diary: 'Caught a great quantity of Fish in the River the largest of which weighed about 15 lb., they were Rock Cod, and Perch' (Kearns, 1822). In 1823, Captain Mark Currie, Joseph Wild and Major John Ovens followed the Murrumbidgee upstream towards the region known as the 'Monaroo'. On the 6th of June, at what they believed to be the Murrumbidgee River (actually the Bredbo River) about 5 km upstream from the Murrumbidgee, Currie wrote: 'Caught a considerable quantity of fish in the river, resembling the rock-cod of Port Jackson' (Currie, 1825; Gale, 1927).

In 1824, William Hovell recorded in his journal that the Murrumbidgee River near Yass:

> abounds with excellent fish, of the same species as that in the Lachlan, and in the other streams which run to the westward. These are in shape like the cod-fish, and of a fine Flavour/These fish weigh in general from five to twenty pounds; some of them even exceed the latter weight (Bland, 1831).

He also sighted cod in the Tumut River just upstream of Tumut and on the return leg of their journey enjoyed successful angling in that river near Brungle catching the 'usual kind', probably referring to cod (Bland, 1831). Captain Charles Sturt in 1829 traced the Murrumbidgee River downstream to its confluence with the Murray River. While camped on the river near Wantabadgery, Sturt noted: 'During our stay on the Pondebadgery Plain, the men caught a number of codfish, as they are generally termed, but which are, in reality, a species of perch. The largest weighed 40 lb. but the majority of the others were small, not exceeding from six to eight' (Sturt, 1833).

In 1832, naturalist George Bennett wrote extensive notes on cod while camped at the junction of the Murrumbidgee and Tumut Rivers:

> Large numbers of native perch are caught in the Yas and Murrumbidgee rivers; their flavour is delicious: their average length is nineteen inches, and the weight from three to six pounds: they have however been taken from two and a half to three feet in length, and weighing seventy pounds; and some even of the enormous size of one hundred, and one hundred and twenty pounds: the breadth is great in proportion to the length of the fish. Those I examined were a yellowish-green colour, covered with irregular black spots, with a silvery abdomen. They are named by the colonists, 'river cod', and by the aborigines, 'Mewuruk' / In the Tumat country, varieties of the 'river cod', are called by the natives Bewuck, Mungee &c (Bennett, 1834).

He also went on to describe another type of fish, probably providing the first European account of Golden perch:

> Another fish of the family of perches is also caught in the Yas, Murrumbidgee, and other large rivers in the colony: it is called the 'perch' by the colonists, and 'Kupé' by the natives. I preserved a specimen, caught in the Murrumbidgee, measuring seventeen inches in length, and six inches at its greatest breadth, containing a fine roe: twenty inches was the greatest length they had as yet been taken in this river / The colour of the Kupé was inclining to bronze; the ends of the scales being black, gave to the fish a checkered appearance (Bennett, 1834).

In 1834, Johann Lhotsky fished the Molonglo River about 12 miles upstream of the Murrumbidgee and 'caught two cod, weighing about 13 lbs. each. A larger one took the bait, and carried away line and all' (Lhotsky, 1979).

John Gale was a noted local historian who was involved in the acclimatisation of Redfin perch, Goldfish and Brown trout in the Canberra region. He recorded the excellent cod fishing that existed in the Queanbeyan River: 'In our own day it is not an uncommon thing for a cod of twenty pounds up to 60 or 70 pounds to be taken from the Queanbeyan River' (Gale, 1927). Gale also recounted stories from the pioneering McKeahnie family, of numbers of cod being present in the Queanbeyan River. He tells of an incident of school children sighting a human body floating in the Queanbeyan River which, when retrieved, was found to be a 'cod with two tails'. When examined it proved to be a 90 lb. (40.9 kg) specimen that had attempted to swallow another fish of 45 lb, (20.5 kg) (Gale, 1927).

In 1848, Sir Terrence Murray translocated 'Murray cod and bream' from the Molonglo River at Yarralumla to Collector Creek at Winderradeen, a feeder stream into Lake George. In subsequent decades the cod population proliferated to such an extent that it developed into a significant commercial fishery (Gale, 1927) and 'prodigious quantities' of large cod were taken from feeder streams such as the Deep Creek near Bungadore (*Braidwood Independent,* 14 September 1867). The Lake George cod fishery met its demise when the lake dried up during the Federation Drought that occurred early in the twentieth century (Gale, 1927).

Large native fish were absent upstream of a set of falls on the upper Molonglo River, and cod from the Lake George system released into the upper Molonglo in 1867 were thought to have become established (*Braidwood Independent,* 14 September 1867; *Queanbeyan Age,* 18 December 1873). An additional translocation of 300 cod and perch from the Queanbeyan River to the upper Molonglo River near Captains Flat occurred in 1886 (*Queanbeyan Age,* 1 May 1886). Similarly, a waterfall barrier on the Ginninderra Creek prevented upstream access of native fish, and cod and perch were translocated from the Murrumbidgee River into the creek (*Braidwood Independent,* 14 September 1867).

In 1867, a public meeting at Braidwood was called to undertake the translocation of cod into the upper reaches of the eastern Shoalhaven catchment. Tenders were called for, and accepted, for the stocking of 200 cod (*Braidwood Independent,* 21 September 1867; 12 October 1867). A further translocation of cod from the lower falls on the Queanbeyan River to the Shoalhaven occurred in 1876 (*Queanbeyan Age,* 8 April 1876), and cod and perch from the Murrumbidgee were released into the Little (Mongarlowe) River a few weeks later (*Queanbeyan Age,* 17 May 1876). A small cod population that developed in the upper Shoalhaven River had disappeared by the 1950s (Gordon Winter, pers. com.), however, a population of Macquarie perch still remains in the Mongarlowe River.

The Murrumbidgee River was the focus of research into the biology of native fish in NSW from an early date. Harald Dannevig successfully stripped and artificially fertilised cod eggs on the Murrumbidgee River 20 miles from Wagga Wagga in 1905 (NSW Fisheries Report, 1905; *Sydney Morning Herald,* 30 May 1905). It was proposed to establish a cod hatchery at Oura on the Murrumbidgee. Alternate sites at Albury, Corowa and Cooma were also considered (*Sydney Morning Herald,* 28 October 1907; *Adelaide Advertiser,* 23 May 1908). David Stead oversaw extensive research into the general biology and reproduction of native fish, much of it conducted on the Murrumbidgee. One project included attempts at the artificial propagation of native fish, collected from the Murrumbidgee River and held in ponds at the government hatchery at Prospect near Sydney (NSW Fisheries Report, 1910-13). Tagging experiments were also conducted to identify if native species undertook migrations (NSW Fisheries Report, 1917).

The observation of large numbers of native fish perishing in the drying lagoons near the Murrumbidgee led to the development of the Nature's Waste Scheme commencing in 1915. During the course of this project, many tens of thousands of native fish were translocated from ephemeral water holes to permanent waters within, and outside of, the Murrumbidgee catchment. An active participant was William Hill, a professional fisherman at Narrandera and later Bringagee, who helped catch the fish and transport them. Another fisherman who worked closely with Stead was J. H. Jarman of Narrandera (*Argus,* 20 July 1917). In 1917, in less than a month, 90,000 juvenile native fish were harvested from waterholes near Darlington Point. This activity continued for a number of years (NSW Fisheries Reports, 1917; 1918; *Sydney Mail,* 8 August 1917).

In 1916, native fish spawning trials were conducted by H. K. Anderson, assisted by William Hill and resident surgeon and naturalist Dr. H. O. Lethbridge of Narrandera, at the newly constructed Berembed Weir. Anderson's report described in detail the artificial propagation of Murray cod and Golden perch (NSW Fisheries Report, 1916). In the 1920s a hatchery facility for native fish was constructed at Burrinjuck Dam, but damage by floods and the inability to secure ripe broodstock, along with financial cutbacks during the Great Depression, lead to its abandonment (NSW Fisheries Report, 1925; 1929; 1932).

During the late 1930s, additional work on propagating cod was undertaken by William Dakin and Geoffrey Kesteven at Berembed Weir (Dakin & Kesteven, 1938). In 1949 and 1950, Colonel John Langtry investigated the Murrumbidgee fishery in the Bringagee area, collecting many observations and sourcing information from the Hill family. Langtry identified the significant changes that had already occurred to both the Murrumbidgee River and its fish population (Cadwallader, 1977). Concern for the declining stocks of native fish ultimately led to the establishment of the Inland Fisheries Research Station, now known as the John Lake Centre, constructed at Narrandera in 1959. The facility conducted fundamental research into the biology of native fish, as well as developing and refining the technology for the artificial propagation of a range of native fish species (Lake, 1959; 1967a).

Photograph 19.1 William Hill's Cod Catch

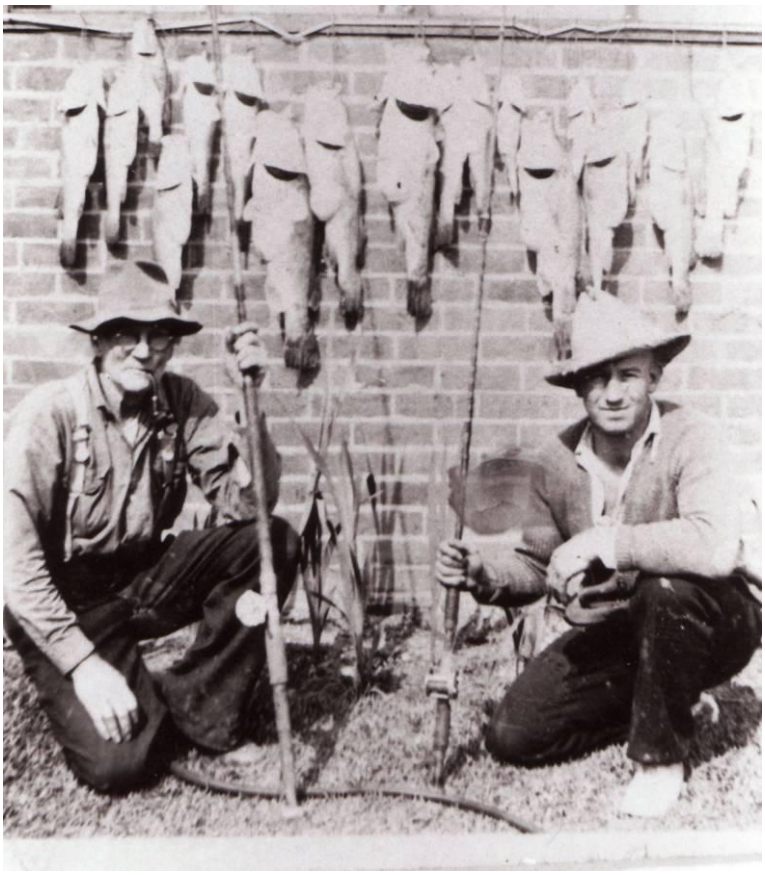


Photo MB 20. William Hill (left) with a catch of Murray cod from the Murrumbidgee River near Narrandera c1940. The lowland habitat of the Murrumbidgee once supported a magnificent cod fishery with the Hill family making a living from it. William Hill commenced fishing in the Narrandera area in 1906 before relocating to the Bringagee area just before the First World War. He assisted David Stead in tagging experiments, H. K. Anderson in his pioneering work at the Berembed Weir in 1916 to artificially propagate native fish, undertook his own work on artificial propagation and later assisted William Dakin and Geoffrey Kesteven in their efforts. He travelled to Fiji accompanying a shipment of Australian bass in an effort to translocate them to that nation. He can be regarded as one of the early pioneers of research on native fish. Photo courtesy of Marge Longford.

19.2 The Past Distribution of Fishes in the Murrumbidgee River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) divided the Murrumbidgee Catchment into a lowland zone (downstream from Wagga Wagga), a slopes zone (upstream to Chindowla, just below Burrinjuck Dam), an upland zone (upstream to near Michelago), and a montane zone beyond the latter location. There is a distinctive change in the physical form of the Murrumbidgee River just upstream of Tharwa at the Gigerline Gorge. This location also represents a point where historical evidence indicates that the composition of the fish fauna changed to species associated more generally with the montane zone, some distance further upstream. Slopes type habitat identified by a confined valley and gravel substrates continues some distance downstream of Wagga Wagga to Colingullie. For simplicity, all habitat zones used in the following discussion match those in the *Sustainable Rivers Audit.*

Most of the historical research in this catchment concentrated on the Murrumbidgee River itself, and to a lesser degree the Tumut River. In other areas there was limited research undertaken. Additional research to locate oral, written and photographic records of native fish in this catchment is warranted. The Yanco Creek originates from the Murrumbidgee and travels south-west to terminate in the Edward River. It is treated separately in another chapter on the streams of the Riverina region.

Much of the information presented below on the lowland zone is sourced from information recorded in the Annual Reports of NSW State Fisheries. This has been combined with some detailed newspaper accounts, museum records and oral history from commercial fishermen. The information on the slopes, upland and montane zones is largely from the journals of early European explorers, some early newspaper accounts and oral history of senior residents (mainly OH 37-51). The oral history includes the recollections of two retired staff members of the ACT Conservation Service and anecdotes provided to the author in the 1980s by the late Gordon Winter, a respected Canberra angler who collected Trout cod specimens for the ACT Conservation Service. Only a small number of old photographs of catches of native fish in this catchment have been located.

19.2.1 The Montane Zone

Cod were very common in the larger rivers of the lower montane zone. Large numbers were present in the Bredbo and Numeralla Rivers (Currie, 1825; *Sydney Morning Herald,* 10 May 1871; Ryrie, OH 38; Gordon Winter, pers. com.). At Cooma, the Murrumbidgee was 'well stocked with Murray cod' (*Sydney Morning Herald,* 10 May 1871). One newspaper account described the past presence of 'perch and cod-fish in the Murrumbidgee and its tributaries near Cooma by the thousand' (*Sydney Morning Herald,* 10 March 1915). Another reported that a flood had stranded large numbers of cod and perch near Cooma (*Sydney Morning Herald,* 16 June 1928). On one occasion, a 60 lb. cod was sighted in shallow water near Cooma (*Queanbeyan Age,* 9 November 1871) while at Michelago cod up to 23 lb. were taken (*Sydney Morning Herald,* 10 May 1871; *Queanbeyan Age & Queanbeyan Observer,* 26 April 1918). NSW Fisheries reports also recorded cod being common near Tarsus (NSW Fisheries Report, 1917) and Cooma (NSW Fisheries Report, 1905). The Murrumbidgee River upstream of Tharwa was subject to a total angling closure during the native fish spawning season until 1905 (NSW Fisheries Report, 1905) implying that up till that time it was officially recognised that a substantial native fishery had existed. Oral history recalls cod as being common at least as far upstream as Bolaro (Hain, OH 39; Ryrie, OH 38). Confirmed cod captures have occurred upstream to at least Yaouk (Pratt, OH 41), with old stories indicating that some cod had been present upstream of Tantangara (Gordon Winter, pers. com.).

The presence of Trout cod in the montane zone is confirmed by a privately owned preserved specimen, photographs (MB11-14), and specimens from Yaouk and Bredbo that were examined by staff from the ACT Conservation Service (Rutzou, OH 40; Pratt, OH 41). First hand oral history indicates that most of the cod taken in the montane zone were Trout cod (Ryrie, OH 38; Pratt, OH 41), though there is evidence to suggest that Murray cod were present, but uncommon. An angler is reported to have taken 'yellowish green' coloured cod near Murrells Crossing (Cooma) sometime between 1965-74, implied to be Murray cod (Mark Lintermans, pers. com.). The late Gordon Winter informed the author that in past years he caught both cod species upstream of Gigerline, but mainly Trout cod (Gordon Winter, pers. com.). Recent captures of Murray cod near Cooma (Lee Payne, pers. com.) are probably derived from stocked fingerlings. Four museum specimens of *Maccullochella macquariensis* recorded from near Cooma in 1906 (*Australian Museum* database) have been lost.

Macquarie perch were historically very common to abundant in the montane zone. Newspapers recorded large numbers of perch or bream near Cooma (*Sydney Morning Herald,* 1 December 1904; 10 March 1915; 16 June 1928), and perch up to 3 lb. were taken near Bolaro (*Sydney Morning Herald*, 13 December 1905). Stead noted that they were present in good numbers in the Numeralla River as well as in the Badja River (NSW Fisheries Report, 1907). He translocated 414 fish from the Murrumbidgee at Tarsus to the Snowy River in 1912 (Stead, 1913). Macquarie perch had been abundant near Michelago (Ryrie, OH 38; Egan, OH 39) and were common in the Murrumbidgee upstream of Tantagara at around 1300 m. ASL, prior to inundation by the dam (Egan, OH 39). During the early 1960s, Anglers setting crosslines captured the species on their spawning run in numbers near Yaouk (Mark Lintermans, pers. com). Cod and perch were recorded as absent at the very source of the Murrumbidgee at Long Plain, with the only fish present being 'myriads of minnows' and large numbers of 'crayfish' (*Queanbeyan Age*, 26 March 1875).

Limited accounts suggest that Blackfish had been present in the montane zone and that the fish was probably quite common. They have been reported from the 'Upper Murrumbidgee River' by David Stead (Ogilby, 1913), near Cooma (*Sydney Morning Herald,* 1 December 1904), Micalong Creek (ACT Government, 1999) and the upper Cotter and Goodradigbee Rivers (Pratt, 1979). Oral history records Blackfish at Colinton, as well as in some of the smaller streams near Michelago and Cooma (Ryrie, OH 38). Silver perch had a seasonal presence in the montane zone as far upstream as the Numeralla area (Pratt, 1979; Pratt, OH 41). It has been suggested that they may have been escapees of fish stocked as fingerlings from local farm dams (ACT Government, 2003). Oral history indicates their reliable capture in numbers near Michelago prior to any stockings, demonstrating that they were naturally present (Ryrie, OH 38). A museum record exists for the species near Cooma in 1908 (*Australian Museum* database) but without collection details. A newspaper story recording the presence of 'cod, bream, perch and gadopsis' suggests that two perch species may have been present near Cooma (*Sydney Morning Herald,* 1 December 1904). While both Macquarie perch and Silver perch have been recorded from montane habitats in the Murrumbidgee, there is no evidence of the past presence of Golden perch in this zone. A record exists of Catfish being collected near Cooma (*Australian Museum* database), but as no specimens or collection details survive it must be considered doubtful, as there are no other accounts supporting this species presence in the montane zone.

19.2.2 The Upland Zone

Caution has to be exercised in interpreting the original presence and abundance of native fish in the upland zone as several early events may have impacted on populations. Major habitat changes are reported to have significantly altered native fish populations by the 1850s (*Sydney Morning Herald,* 31 January 1877). The construction of Burrinjuck Dam around 1912 created a barrier to upstream fish movement into this zone. The

translocation of in excess of a hundred thousand fish to Burrinjuck around 1917 (NSW Fisheries Reports, 1917; 1918) may have altered the composition of the fish fauna reported in subsequent oral history.

Early accounts describe cod as being abundant in the upland zone in the Queanbeyan River (Kearns, 1822; *Braidwood Independent,* 28 September 1867; *Queanbeyan Age,* 8 April 1876) and in the Molonglo River (Gale, 1927; Shumack & Shumack, 1967). Cod were abundant in the Murrumbidgee River near Tharwa (Scott, 2001) and in 1865, a single angler caught 12 cod up to 28 lb. in weight, and another angler six fish up to 16 lb., amounting to a total weight of 55 lb. from the Murrumbidgee River (*Queanbeyan Age & General Advertiser,* 12 January 1865). A commercial fishery for cod operated near Yass until the 1930s, also suggesting that the fish had been abundant (NSW fisheries Report, 1930). Cod were common in the Yass River near Gundaroo (Smith, 1820) and at Yass the river was described as 'literally teeming with cod fish' where, on one occasion, four anglers in a few hours 'caught with lines sixty-one fine fish, weighing from two to six pounds each' (*Yass Courier,* 28 November 1857). Cod were present in the Goodradigbee River near Wee Jasper (Anderson, 1931), and in the Flea Creek area, but were prevented access to the Brindabella area by waterfalls (*Queanbeyan Age,* 23 November 1906). In the upper Tumut River, cod were very common (*Sydney Morning Herald,* 11 December 1909; NSW Fisheries, 1906) and were present upstream to a waterfall barrier above Lobbs Hole (Hill, OH 45). The population was reported to be bolstered by annual migrations into the area (*Sydney Morning Herald,* 22 September 1894).

Conclusive historical evidence for Trout cod in the upland zone exists in the form of museum specimens collected near Yass in 1885 (Macleay, 1885) and the Gigerline Gorge in 1970 (Berra & Weatherly, 1972). They were reported from the Queanbeyan River (*Sydney Morning Herald,* 27 November 1909). Oral history records their presence in the Murrumbidgee River at Uriarra, Red Rocks and the Sandwash Hole at the bottom of the Gigerline Gorge near Tharwa (Pratt, OH 41; Rutzou, OH 40). The oral history begins after major declines had occurred in upland cod populations, making it difficult to assess the original relative abundance of the two cod species. The frequency of captures of Trout cod from the Gigerline Gorge during the early 1970s, combined with reports of them being regularly taken in the Murrumbidgee, both immediately upstream and downstream of the upland zone (NSW Fisheries Report 1910-13; Ryrie, OH 38), suggests that they had been at least locally abundant. Similarly, Murray cod were probably originally abundant.

Macquarie perch were abundant in the Murrumbidgee and Goodradigbee Rivers (*Argus*, 10 August 1917; Anderson, 1931), and at least common in the Cotter and Molonglo Rivers (Gale, 1927; Pratt, 1979; Lintermans, 2002). In 1908, an angling party captured 'eight large black perch and some sprats' from the lower Cotter River (*Queanbeyan Age,* 29 January 1907). As recently as 1948, it was reported that one hole in the Molonglo River near Scott's Crossing held hundreds of perch (*Canberra Times,* 7 May 1948). In the Goodradigbee River, Macquarie perch were very common (Anderson, 1931; *Argus*, 10 August 1917), and were present upstream to waterfalls between Flea Creek and Brindabella (*Queanbeyan Age,* 23 November 1906). Newspaper accounts at Queanbeyan recorded at intervals the arrival, at times in numbers, of a second perch species that was silver in colour which probably referred to Silver perch (*Queanbeyan Age,* 3 March 1870, 26 January 1915, 3 January 1919). Silver perch were one of the most frequently caught species in the Murrumbidgee River at Uriarra, particularly during upstream migrations, prior to the construction of Burrinjuck Dam (Pratt, OH 41). They were also abundant in the dam after filling (Craven, OH35; Hill, OH 45; Moore, OH 42). They were found in the Yass River upstream to Gundaroo (Pratt, 1979), in the Goodradigbee River upstream to Flea Creek (Anderson, 1931; Pratt, 1979), and in the lower Cotter River (Gilligan, 2005). The oral history suggests that Golden perch were originally not particularly common in the upland zone, their presence being related to upstream migrations when fair numbers were taken (Pratt, OH 41). They were reported in the Yass River (Bennett, 1834) and present, but rare, in the Goodradigbee River (*Argus*, 10 August 1917).

There are few early accounts of Blackfish in the upland zone; they were common in the Goodradigbee River upstream of Wee Jasper (Anderson, 1931; Macleay, 1885), and in the Jounama Creek, where they were present and abundant (Ogilby, 1913; Franklin, 1963). There are no confirmed historical records indicating the presence of Catfish in the upland zone prior to their translocation to Burrinjuck Dam in 1917 (NSW Fisheries Report, 1917). One historical account records an 'unknown animal' and its calf, probably a seal, to have made its way into the upper Murrumbidgee (*Queanbeyan Age,* 3 March 1870).

19.2.3 The Slopes Zone

Early accounts describe cod being abundant in the slopes zone in the Murrumbidgee River (Bland, 1831; Sturt, 1833; Bennet 1834) and the Tumut River (*Sydney Morning Herald,* 22 September 1894). Cod were also present in some smaller streams such as the Tarcutta Creek at Tarcutta (*Sydney Morning Herald,* 26 April 1854) and in Gilmore Creek (Hill, OH 45). In the lower Tarcutta Creek near Borambola, cod up to 45 lb. (20.5 kg) were taken (*Camperdown Chronicle,* 5 August 1937). Both Murray cod and Trout cod were formerly abundant in the Murrumbidgee River between Gundagai and Wagga Wagga (Laney, OH 46), as well as in the Tumut River (Denson, OH 51). In 1904, seven museum specimens of Trout cod were collected near Wagga Wagga and near Gundagai (NSW Fisheries Report 1910-13; Berra, 1974; Gilligan, 2005) confirming their presence. Macquarie perch were abundant in the Murrumbidgee, Tumut and Goobarragandra Rivers (Laney, OH 46; Hill, OH 45; Ballard, OH 43) and were common in smaller streams such as the Tarcutta, Adjunbilly and Gilmore Creeks (Cockburn, OH 47; Ballard, OH 43; Hill, OH 45). They were also present in lagoons near the Tumut River (Denson, OH 51).

Silver perch were abundant, and Golden perch were very common to abundant in the slopes zone of the Murrumbidgee River (Bennett, 1834; Laney, OH 46; Ballard, OH 43). Museum specimens of Silver perch were sourced near Tumut (*Sydney Morning Herald,* 13 June 1864), and they were present upstream to the Blowering area (Pratt, 1979). Golden perch have only been reported from the lower reaches of the Tumut River (Pratt, 1979). 'Perch' and 'bream' were recorded as being common in the lower Tarcutta Creek with a specific record (*Camperdown Chronicle,* 5 August 1937) indicating that Golden perch were common in this stream. One catch of native fish exceeding half a hundred weight was taken in half an hour from the Tarcutta Creek (*Camperdown Chronicle,* 5 August 1937).

Catfish were common in lagoons near the Murrumbidgee at Gundagai (Ballard, OH 43), as well as being found in lagoons and creeks at Wagga Wagga (Laney, OH 46). They had been regularly taken in small numbers from the river itself at Wagga Wagga (Harry Laney, pers. com.) and specimens were collected near Tumut (*Sydney Morning Herald,* 13 June 1864). Oral history recalls Blackfish to have been abundant in creeks in the slopes zone including the Adjunbilly and Gilmore Creeks (Ballard, OH 43; Hill, OH 45; Denson, OH 51), with the fish very common to abundant in the Murrumbidgee River (Brook, OH 44; Laney, OH 46). They have also been recorded from the Goobarragandra River (Ogilby, 1913). Seals have also been reported in the Gundagai area as recently as 1947 (*Western Mail,* 25 June 1953).

19.2.4 The Lowland Zone

In the lowland zone all the larger native fish species were present, and supported a significant commercial fishery, with the official total catch at Hay alone exceeding 34 tonnes in 1915 (NSW Fisheries Report, 1915). There is evidence of changes in the relative abundance of a number of fish species progressively downstream in this zone. Murray cod were abundant in the lowland Murrumbidgee River (Bailey, OH 48; Denson, OH 51), in lagoons at Karwar Station near Darlington Point (*Sydney Mail,* 8 August 1917) and in Yanga Lake where large

numbers perished during a drought in 1888 (*Camperdown Chronicle,* 6 October 1931). In 1910, David Stead observed that Trout cod rivalled Murray cod in abundance between Wagga Wagga and Narrandera (NSW Fisheries Report, 1910-13). They were considered to be 'fairly common' at Narrandera by professional fishermen (*Argus*, 1 October 1920). Their presence is confirmed by museum specimens obtained at Narrandera between 1908 and 1920 (*Australian Museum* database) and newspaper accounts (*Narrandera Argus,* 11 January 1910). The Trout cod population in Cataract Dam was translocated using fish sourced from the Berembed Weir area in 1916 (NSW Fisheries Reports, 1914; 1923), also confirming their past presence in that area.

Downstream of Narrandera, Trout cod were present but less prevalent than further upstream. A single museum specimen recorded as being obtained at Hay exists, but most from the Murrumbidgee originated from near Gundagai, Wagga Wagga or Narrandera (*Australian Museum* database; Gilligan, 2005). A sample of nine cod captured near Leeton in 1932 is held by the *Australian Museum,* and was examined by the author. Only one is a Trout cod. Oral history originating after the 1920s indicates that they were taken near Darlington Point but were not common (Hardie, OH 49; Wallace Clifford, pers. com.). Langtry (Cadwallader, 1977) failed to catch any Trout cod at Bringagee around 1950, though he recorded that the Hill family had caught them regularly in past years and that they were occasionally taken near Balranald. Trout cod were not recorded in any shipments of translocated fish from Bringagee (NSW Fisheries Reports, 1915, 1917, 1918; Anderson, 1918), whereas they were identified in those originating further upstream towards Wagga Wagga (NSW Fisheries Report, 1914). An earlier indication of the original abundance of Trout cod in the lower Murrumbidgee comes from a 1910 newspaper account. David Stead reported that out of an angler's catch of 25 cod taken near Hay, two were Trout cod. This contrasts with their reported abundance further upstream near Narrandera (*Sydney Morning Herald,* 28 May 1910; NSW Fisheries Report, 1910-13).

Macquarie perch progressively declined in abundance downstream in the lowland zone. They were fairly common in the Old Man Creek near Colingullie, though less prevalent than Silver perch (Laney, OH 46). At Narrandera they once had been taken regularly in small numbers from the river (Bailey, OH 48), though were more common in the tributaries (*Argus,* 4 August 1922). Oral history suggests they were scarce at Carathool (Laney, OH 46; Denson, OH 51) and Langtry reported their rarity at Bringagee c1950 (Cadwallader, 1977). Records of translocation activities from lagoons at Bringagee between 1915 and 1918, indicate that numbers of Macquarie perch were taken, and that they were more common than Silver perch in these habitats at that location (Anderson, 1918). This suggests that Macquarie perch were originally more prevalent in the lower Murrumbidgee than that indicated by recent (post 1920s) oral history. They have been taken by anglers as far downstream as Hay (Davidson, 1968).

Golden perch and Silver perch are reported to have been abundant in the lowland zone of the Murrumbidgee River (Cadwallader, 1977; Bailey, OH 48; Denson, OH 51), and a Golden perch of just over 42 lbs. (19.1 kg) in weight was captured near Wagga Wagga (Roughley, 1955). Golden perch were also abundant in lagoons and still anabranches (Anderson, 1918; *Sydney Mail,* 8 August 1917: Denson, OH 51). Silver perch were less prevalent in than Golden perch in lagoons at Bringagee and near Narrandera (Anderson, 1918; *Argus,* 11 August 1922), though were abundant in small waterholes at Karwar Station near Darlington Point (*Sydney Mail,* 8 August 1917). In lagoons, Golden perch matched Murray cod in numbers, though in the river cod were considered to be more abundant (*Argus,* 10 August 1917). Oral history recalls that Catfish were abundant in lagoons and creeks (Bailey, OH 48; Hardie, OH 49; Denson, OH 51), and were regularly taken from the Murrumbidgee River (NSW Fisheries Reports, 1915; 1918; 1930). Written accounts record their presence in lagoons at Bringagee (Anderson, 1918) and at Karwar Station near Darlington Point (*Sydney Mail,* 8 August 1917). At specific locations they were abundant in the river itself, and on one occasion 40 were taken in one day (NSW Fisheries Report, 1929; Denson, OH 51) with an account describing nest construction near

Narrandera (*Argus,* 10 August 1917). Blackfish were abundant at the top of the lowland zone in the Old Man Creek at Collingullie (Laney, OH 46). Oral history does not recall their presence in the river near Bringagee (Denson, OH 51), but they were recorded as present in numbers in nearby lagoons (Anderson; 1918; NSW Fisheries Reports, 1917; 1918), in small waterholes near Darlington Point (*Sydney Mail,* 8 August 1917) and in the Hay area (Ogilby, 1913). Overall, Blackfish appear to have progressively declined in abundance downstream in the lowland zone in the river, but were common in the creeks and lagoons. Lampreys, probably Short-headed lampreys (Lintermans, 2007), were present as far upstream as Wagga Wagga with a specimen being found inside a cod (*Argus,* 11 April 1922).

19.2.5 Estimates of Native Fish Abundance in the Murrumbidgee Catchment at European Settlement.

Presented below are the rarity scores used in the *Sustainable Rivers Audit* (Davies *et al.,* 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales of the Trout Cod* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 19.1 Murrumbidgee River Catchment Rarity Scores (Main River Channels)

	Lowland (downstream of Wagga Wagga)		**Slopes** (Wagga Wagga to Chindowla)		**Upland** (Chindowla to Michelago)		**Montane** (upstream of Michelago)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod	3	**3**	3	5	3	5	3	U3
Murray cod	5	**5**	3	5	3	5	0	1
Golden perch	5	**5**	3	**3**	3	U1	0	0
Silver perch	5	**5**	3	**5**	3	**U3**	0	1
Macquarie perch	1	L3	3	**5**	5	**5**	5	**5**
Catfish	5	**L5**	3	3	0	0	0	0
'Blackfish'	3	L3	5	**5**	3	**3**	3	3

Key

0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type supported by multiple accounts or lines of evidence e.g. oral history, newspaper accounts, photographs

Figure 19.2 Historical Records for Murray cod and Trout cod in the Murrumbidgee River Catchment

(Note: Records in the Yanco and Billabong Creeks have been included in the section on the Riverina Catchment)

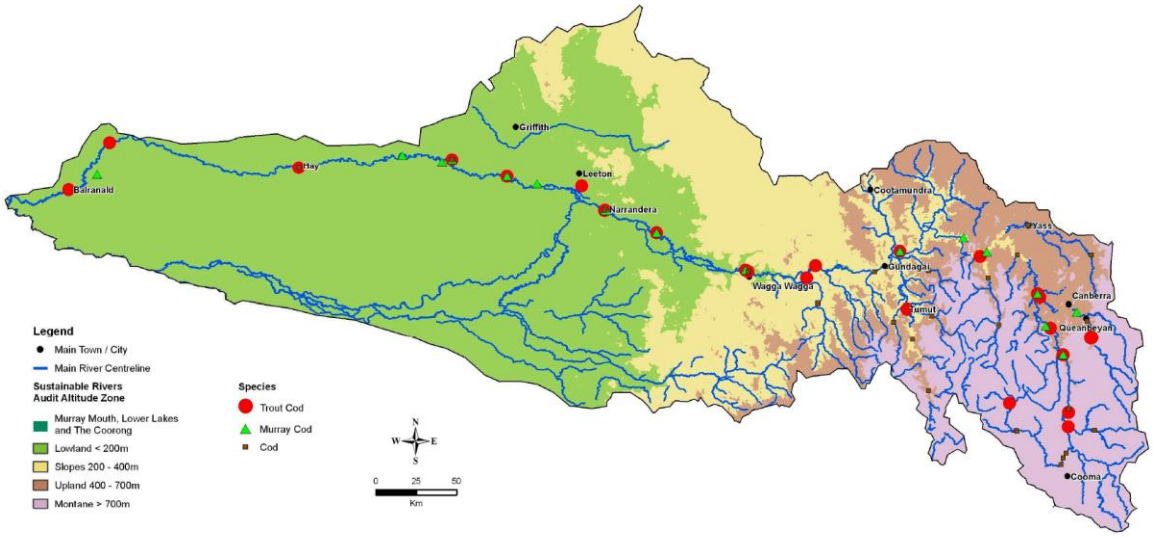
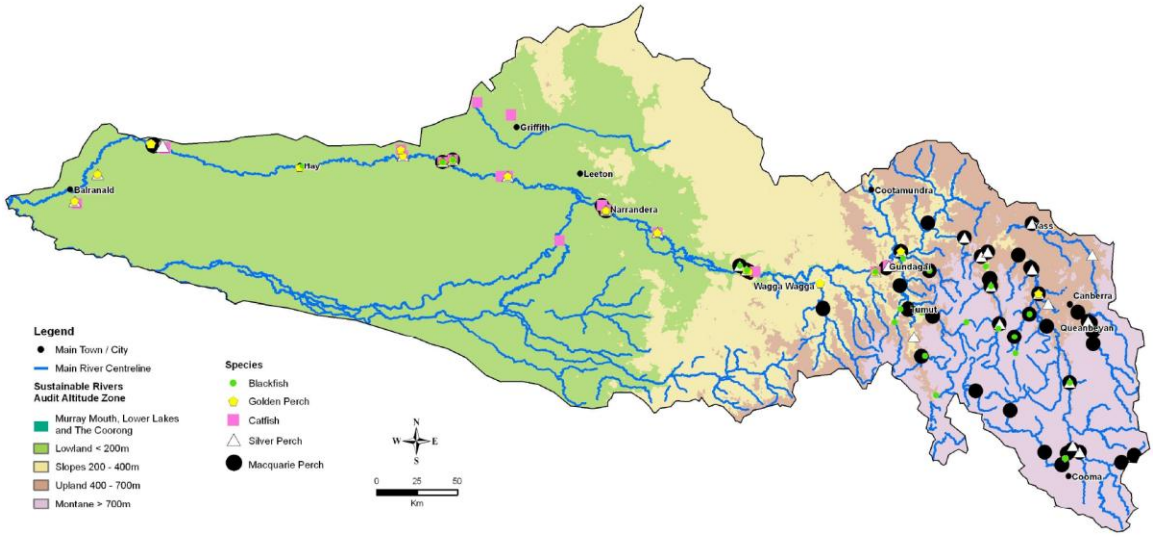


Figure 19.3 Historical Records for Native Fish Species other than Cod in the Murrumbidgee River Catchment

(Note: Records in the Yanco and Billabong Creeks have been included in the section on the Riverina Catchment)



Photograph 19.2 Colinton Gorge Trout Cod

Photo MB 14. A member of the Ryrie family holds an 11 pound (5.0 kg) Trout cod caught by David Ryrie from the Murrumbidgee River near Colinton, May 1967. The fish was subsequently mounted and survives in David's study. David recalled catching numbers of Trout cod in the area without ever seeing a Murray cod. Other photos examined by Dr. Bryan Pratt of some of those captures caught on fly tackle validate his account. Photo courtesy of David Ryrie.

Photograph 19.3 Preserved Colinton Trout Cod

The mounted specimen of the 11 lb. (5.0 kg) Trout cod taken by David Ryrie from the Murrumbidgee River near Colinton, May 1967. This trophy is indisputable proof of the species former presence in montane habitats. Photo courtesy of Simon Kaminskas.

Photograph 19.4 Gigerline Gorge Murray Cod

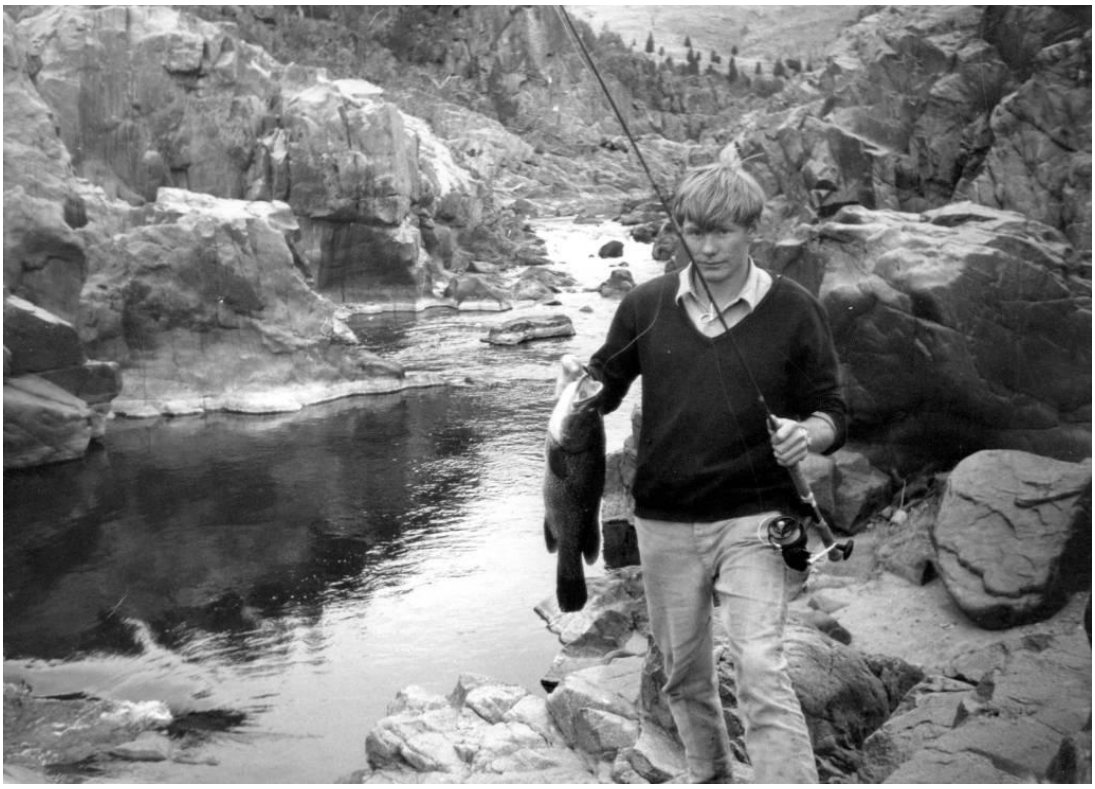


Photo MB 15. David Ryrie with a Murray cod caught from the Murrumbidgee River, Gigerline Gorge near Tharwa, March 1968. This area was the last stronghold of Trout cod in the upper Murrumbidgee and clearly depicts the features of the habitat associated with the species in the region. Murray cod appear to have been scarce upstream of this point. Photo courtesy of David Ryrie.

Photograph 19.5 Kambah Catch

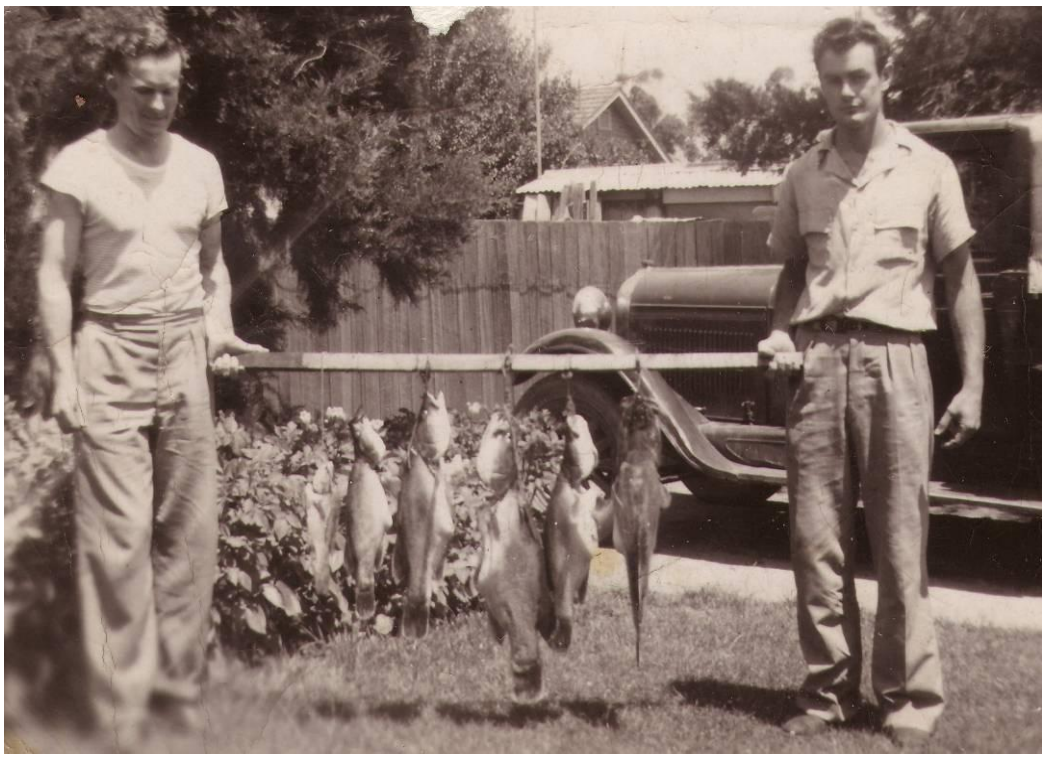


Photo MB 5. A catch of Murray cod including a small Macquarie perch (far left) captured from the Murrumbidgee River in the Kambah area c1949-50. Norman Moore (left) & Ross Holmes. Photo courtesy of Norman Moore.

Photograph 19.6 Murrumbidgee Trout Cod

These Trout cod museum specimens were collected at Hay in 1904 (top) and at Wagga Wagga in 1908 (bottom). Most specimens collected by David Stead and his associates originated from Gundagai, Wagga Wagga and Narrandera. Photo copyright of the *Australian Museum.*

Photograph 19.7 Hill Family Catches

Left: Photo MB 19. William Hill (right) with a crayfish from the Murrumbidgee River at Bringagee c1920. Hill was one of the pioneers on work into the artificial propagation of native fish and responsible for the collection and translocation of large numbers of fish for the 'Natures Waste Program'.

Right: Photo MB 23. Edward (Ted) Hill (left) and Bill Parker in a 20 foot wooden boat with a catch of fish including Golden perch and Silver perch from the Murrumbidgee River at Bringagee c1945. Both photos courtesy of Marge Longford.

Photograph 19.8 Bringagee Catch

Photo MB 18. Professional fisherman William Hill in his boat with a catch of fish including Murray cod from the Murrumbidgee River at Bringagee c1925. The image conveys a clear impression of the existence of a prolific cod population in the area at that time. Photo courtesy of Marge Longford.

19.3 The Changes

19.3.1 Changes to Native Fish Distribution and Abundance

In the montane zone a reduction in cod numbers had occurred by the 1870s (*Sydney Morning Herald,* 10 May 1871), though they were still considered to be common in 1915 (*Sydney Morning Herald,* 10 March 1915). By the 1950s, the cod population had seriously declined, although regular captures occurred at specific locations (Hain, OH 39; Ryrie, OH 38). Occasional captures of Trout cod occurred into the 1970s with the last reports from near Michelago around 1986 (Rutzou, OH 40; Ryrie, OH 38; Egan, OH 39). Macquarie perch had become rare in the tributaries of the Murrumbidgee by the Second World War, the last capture from the Badja River, by local resident James Sullivan, occurring during the late 1950s (Mark Lintermans, pers. com.). Occasional captures took place in the lower Numeralla River up to the 1970s (Pratt, OH 41). They remained locally common in the Murrumbidgee River in the 1960s (Pratt, 1979; Hain, OH 39; Ryrie, OH 38) but declined during the 1970s (David Ryrie, pers. com.).

In the upland zone, changes to native fish populations are reported to have occurred by the 1850s, with a decline in cod, and an increase in perch numbers attributed to environmental change (*Sydney Morning Herald*, 31 January 1877). By the 1890s, there had been a dramatic decline in catches of native fish in the Yass River (*Yass Courier,* 11 February 1898). By 1906, few cod were being taken (NSW Fisheries Report, 1906). Cod flourished in Burrinjuck Dam after its filling (Craven, OH 35), and were considered common up to the 1950s (Moore, OH 42). After the construction of Burrinjuck Dam, Golden perch disappeared from the upper Murrumbidgee River (Pratt, OH 41) but Silver perch remained common upstream until the 1970s (Pratt, OH 41). Macquarie perch were very common in Burrinjuck Dam as well as in the river upstream until the early 1950s (Craven, OH35; Moore, OH 42). By the 1970s, however, they had declined and were only commonly caught during their spawning migration (Greenham, 1981; Pratt, OH 41). They underwent a further decline during the 1980s and are now rare (Lintermans, 2002).

In the slopes zone, a general reduction in native fish abundance in the Murrumbidgee River was reported by the 1890s (*Sydney Morning Herald*, 22 September 1894). Near Wagga Wagga, a major reduction in cod catches had occurred by 1928 (*Sydney Morning Herald,* 23 January 1928), though cod, Macquarie perch and Silver perch remained fairly common up to the 1930s (Ballard, OH 43). Trout cod were common between Gundagai and Wagga Wagga until the early 1930's (Laney, OH 46), but had disappeared by the 1950s (Ballard, OH 43). Macquarie perch had declined in abundance in the Murrumbidgee at Gundagai by the 1960s (Ballard, OH 43), and disappeared from the Tarcutta Creek and the Murrumbidgee during the 1980s (Cockburn, OH 47). They remained common in the Tumut River and some of its tributaries until the 1970s (Hill, OH 45; Denson, OH 51). Catfish were still common in the 1930s (Laney, OH 46; Ballard, OH 43), but by the 1950s had become scarce (Ballard, OH 43).

In the lowland zone, a major decline in the cod fishery was reported by the late 1920s (*Sydney Morning Herald,* 8 September 1937). Trout cod were common at Narrandera up to the end of the First World War (NSW Fisheries Report, 1910-13; *Argus*, 1 October 1920), but by the late 1930s were rare (Hardie, OH 49; Bailey, OH 48; Cadwallader, 1977). Occasional captures took place up to the 1970s (Davies, OH 75). Macquarie perch were rare by the 1930s (Bailey, OH 48), but occasional captures took place into the 1960s (Davidson, 1968). Murray cod, Golden perch and Silver perch remained relatively common up to the 1950s, after which declines took place (Hardie, OH 49; Bailey, OH 48; Denson, OH 51). Catfish are recorded as having become scarce in

parts of the Murrumbidgee River by 1937 (*Sydney Morning Herald,* 7 August 1937). Both Silver perch and Catfish became rare at Carathool by the mid 1970s (Denson, OH 51). Although they were still regularly captured, Murray cod and Golden perch catches had declined by the 1980s (Bailey, OH 48; Noel Denson, pers. com.).

19.3.2 Changes to Habitat

The introduction of stock resulted in the silting of Jugiong Creek as early as 1840 (*Sydney Morning Herald*, 31 January 1877). In the Bredbo area, gully erosion commenced between 1848 and 1887, causing the silting of the lower Bredbo and lower Numeralla Rivers. At Michelago the incision of gullies took place between 1860 and 1913, causing the silting of the Michelago Creek (Starr *et al.,* 1999). The Naas River suffered severe silting by 1852 (*Sydney Morning Herald*, 31 January 1877), and large flood events in 1852, 1862 and 1870 resulted in the silting of the Murrumbidgee River between Michelago and Yass (*Sydney Morning Herald*, 31 January 1877; Starr *et al.,* 1999; Scott, 2001). Heavy erosion occurred in the upper Yass catchment between 1860 and 1900 (Scott, 2001), causing the Yass River to become shallower and wider (*Yass Courier,* 11 February 1898). In 1855 removal of snags from the Murrumbidgee River for riverboat traffic commenced (*Adelaide Register,* 7 March 1859), and by 1870 much of the river downstream of Gundagai had been desnagged (*Sydney Morning Herald*, 26 November 1866; *Argus,* 2 June 1868; *Sydney Morning Herald*, 25 March 1870).

During the 1870s, the first attempts were made to acclimatise exotic fish in the upper Murrumbidgee catchment. Goldfish were introduced to the Queanbeyan area in the 1870s (Clemments, 1988) and were first seen at Wagga Wagga and Gundagai in the early 1890s (*Sydney Morning Herald, 23* April 1890; 9 September 1891). European carp were possibly included in the shipments of Goldfish to Queanbeyan. Carp-like fish up to 41 lbs. (18.6 kg) were held in ponds, and similar fish were captured from the Yass and Queanbeyan Rivers (*Yass Courier,* 24 December 1875). Genetic evidence suggests that a distinctive strain of European carp found in Tasmania still exists in the Canberra region (Davis *et al.,* 1999). Another introduction of European carp, the Prospect Strain, occurred sometime after 1907 (Stead, 1929), resulting in the establishment of a small population in the lowland zone (Lake, 1959). The Boolarra strain first appeared in the Murrumbidgee River in 1976 and by the 1980s had become abundant. This fish is associated with a decline in Catfish populations (Gilligan, 2005).

Redfin perch were liberated into the Queanbeyan, Molonglo, Naas and Cotter Rivers in 1888 (Arentz, 1966; NSW Fisheries Reports, 1902, 1905; *Queanbeyan Age,* 30 June 1888), and later into the Queanbeyan River (*Sydney Morning Herald,* 6 August 1902) and Cowra Creek near Numeralla (*Sydney Morning Herald,* 29 May 1908). There is no evidence that any of these early introductions into the wild were successful. A population was maintained in a dam on a property at Queanbeyan which was used to establish the species elsewhere in NSW (*Sydney Morning Herald,* 31 October 1905). Langtry reported that Redfin perch first appeared in numbers near Narrandera during the 1930s. He suggested that their arrival impacted on native fish populations, particularly in lagoons (Cadwallader, 1977). Redfin perch were first reported upstream of Burrinjuck Dam in 1986, and are associated with a decline in Macquarie perch (Lintermans *et al.,* 1990). Early attempts were made to introduce Brown trout to the Murrumbidgee catchment in 1878 and 1888 (*Argus*, 29 June 1888; *Queanbeyan Age,* 30 June 1888). Wide scale government stockings commenced in 1892 (NSW Fisheries Reports, 1892: 1895). A contemporary account reported that the introduction of trout had an adverse impact on native fish populations in the Monaro region (*Sydney Morning Herald,* 21 December 1907).

Major fish kills have been recorded in this catchment. Mortalities occurred in the Queanbeyan River in 1895 with the fish exhibiting the symptoms of 'Saprolegnia', possibly induced by low flows or wool scour pollution

(*Sydney Morning Herald,* 1 August 1895; *Queanbeyan Age,* 10 August 1895). Large kills attributed to fish eating rabbit baits washed into the Queanbeyan and Molonglo Rivers occurred in 1903 (*Sydney Morning Herald,* 10 March 1903). Further kills occurred in the Molonglo in 1908 (*Sydney Morning Herald,* 9 March 1908). In 1909, concern was expressed about the impact of mining activities on the water quality of tributaries of the Tumut and Murrumbidgee Rivers as far downstream as Narrandera (NSW Fisheries Report, 1909). A large kill occurred near Wagga Wagga in 1914 (NSW Fisheries Report, 1914), followed by an event between Wagga and Narrandera in February 1915. Both were linked to rain events severely muddying the river and killed an enormous number of fish (*Argus*, 24 February 1915; Scott, 2001). A further kill took place in 1918 when it was reported that large numbers of cod were affected by a fungus (NSW Fisheries Report, 1918; Hill, OH 37).

In 1939 and 1942, mine tailings dams at Captains Flat collapsed releasing copper residues into the Molonglo River. The pollution resulted in extensive fish kills in the Molonglo (Moore, OH 42). Fish kills possibly caused by pollution were reported downstream into the Murrumbidgee River to at least Uriarra where many dead cod were observed (*Canberra Times,* 25 January 1939). During the late 1960s large numbers of Silver perch died in the Murrumbidgee from Canberra to Berembed Weir with some fish reported to be covered in red ulcers (Pratt, OH 41; Laney, OH 46).

The construction of the Berembed Weir in 1911, followed by the completion of Burrinjuck Dam in 1916, enabled irrigation to commence in the district. Further diversionary weirs were constructed at Wantabadgerie, Gogeldrie and Yanco, and an enlargement of Burrinjuck Dam was completed in 1928. Water diversion from the river caused a rapid proliferation of aquatic plants in the Murrumbidgee downstream of the Yanco Weir (NSW Fisheries Report, 1930). Variations in water levels for irrigation are suggested to have exposed cod spawning sites in the Murrumbidgee River, possibly killing eggs and larvae (Hill, OH 37). River regulation was linked to a decline in the cod fishery by the 1930s (*Sydney Morning Herald,* 8 September 1937). Construction commenced on the Snowy Mountains Scheme in 1949. This included the creation of a series of reservoirs on the Tumut River, enlargement of Burrinjuck Dam, and the construction of Tantangara Reservoir - the latter completed in 1956.

Today, there are 26 dams or weirs controlling water in the catchment. These have greatly altered the natural flow regime with a reduction in flood peaks and frequency (Frazier *et al.,* 2005). Flows immediately downstream of Tantangara have been reduced to 1% of pre-impoundment conditions, and in the ACT, flows are now only 57% of that which existed under natural conditions (Lintermans, 2005). The natural thermal regime of the Murrumbidgee River is depressed below Burrinjuck Dam for about 300 kilometres due to cold water releases from the storage, with additional thermal pollution introduced by dams on the Tumut River (Astles, 2001).

19.4 The Current Situation

The *Sustainable Rivers Audit* concluded that the native fish populations of the Murrumbidgee River Catchment were: 'in Extremely Poor Condition. The community had lost most of its native species richness and was dominated by alien fish, which were more than 87% of total biomass and 71% of total abundance. The Slopes and Upland Zone communities were in especially poor condition (Davies *et al.,* 2008).'

While there has been a major decline in native fish species richness and abundance, the catchment contains a number of populations of Macquarie perch of high conservation significance. This includes those in the Murrumbidgee River between Yaouk and Michelago, some in the Cotter River, and a translocated population in the Queanbeyan River. Trout cod have been stocked at points from Adaminaby to Narrandera, with self-

supporting populations now established in Bendora Dam on the Cotter River, and in the Murrumbidgee River between Gundagai and Narrandera. Upstream of Burrinjuck Dam, significant populations of Murray cod and Golden perch are supported by ongoing stocking and a remnant population of Silver perch exists. Below Burrinjuck, Silver perch are scarce, Catfish rare, and populations of Murray cod and Golden perch are supported by stockings.

The upper Murrumbidgee River between Bredbo and Casuarina Sands, as part of the Murray-Darling Basin Authority's *Native Fish Strategy,* has been designated as a 'demonstration reach'. Here a range of rehabilitation activities will be conducted with community participation to improve habitat and restore native fish populations.

19.5 Newspaper Highlights

The Australian, 21 March 1839
Yass (From our own correspondent)
Want of rain is a long-standing complaint throughout the Colony, and in this district especially; and it is one, I am sorry to say, that there are no apparent signs of being soon remedied in this quarter. Those water holes in which the good folks of Yass used, in times gone by, to angle for rock-cod, are now completely dried up, and water will soon become as scarce as rain has been, unless a wet season speedily sets in. The appearance of the entire plain is sterile in the extreme – not the slightest appearance of vegetation is anywhere visible. So much for the state of the country in this quarter.

Sydney Morning Herald, 26 April 1854
Notes of an Overland Journey to the Ovens and Melbourne. / The situation of the township is on the banks of a large creek, with very steep sides. The scenery is very beautiful, and the place altogether well adapted to the purposes of an inland town. After camping in the evening, we amused ourselves fishing in Tarcutta Creek, but one cod was all the sport which we secured.

Yass Courier, 28 November 1857
Fishing – The Yass River is now, in many parts, literally teeming with cod fish, some of them of considerable size; large quantities are caught by private parties and brought into town. The other evening a party of four gentlemen proceeded about nine miles up the river, and in a few hours they caught with lines sixty-one fine fish, weighing from two to six pounds each.

Sydney Morning Herald, 27 October 1865
Good Haul of Fish. Mr. D. Davis of Cooma-street (Yass- WT) was particularly fortunate in a fishing excursion made to the Murrumbidgee a day or two since. He succeeded in catching upwards of forty splendid fish, averaging from four to five pounds weight. These, with five brace of pigeons, amply repaid him for a night spent on the river's bank at this propitious season for 'camping out'. The take of fish is the more extraordinary, as the drought has brought the waters of the Murrumbidgee to a low ebb, and fishermen generally were waiting for a "fresh" before commencing operations.

Queanbeyan Age, 3 March 1870
Strangers In The Waters Of The Murrumbidgee. A huge amphibious animal has lately been seen on the banks and in the waters of the Murrumbidgee a short distance below the confluence of the Queanbeyan with that river. From all accounts it appears to be exceedingly wary and dives to the bottom of the river on the least alarm. Whatever the animal is it is evidently making its way up the river, as last year it was seen in the vicinity of Yeumberra. One person who saw it described it as being about eighteen feet long and said it was accompanied by another and smaller apparently its calf. – A less disagreeable new-comer in the river has been taken in two or three instances by anglers this season – a fish (said to be the bream, and common to the waters below Wagga Wagga) of a silvery colour, having very small scales, a small mouth, and of similar proportion to the herring. It is of delicious flavour, and like the river lobster has but recently found its way to the upper regions of the Murrumbidgee.

Sydney Morning Herald, 10 May 1871
The Manaro portion of the Murrumbidgee used to be well stocked with Murray cod, but these are not so plentiful as they were. A flood gets credit (perhaps justly) for having lessened their numbers; yet they are still to be found in it, also in the Umeralla.

Yass Courier, 24 December 1875
A NEW FISH – Mr John Oldfield of Yarralumla, has informed us that he recently caught a couple of very fine fish in the Murrumbidgee near Bulga Creek of quite a distinct variety from the bream, perch and cod, which are supposed to be the only kinds of fish inhabiting the waters of the upper Murrumbidgee River and its tributaries. The two specimens caught by Mr Oldfield, weighed respectively 1¾ and 2½ lbs. He describes them as being of a bronze or dark gold colour on the upper sides and back, with silvery bellies; the head and mouth larger than that of the perch or bream, but smaller than that of the cod, with a projecting lower lip, the back not being arched like that of the bream or perch, they take the bait (a worm) very freely, are strong and lively, and afford good sport to the angler.

Another resident of Yarralumla, Mr Oldfield says, has caught several of the same fish in the Queanbeyan River. We would like to see a specimen of this newcomer in our river hereabouts, and to know something of its origin, our present opinion is that it is the golden carp, which has been acclimatized by Mr Davis in his pond at Gungahline, where it has attained the respectable weight of from 21 lbs to 41 lbs and has escaped from that locality to the Queanbeyan River by means of the creek, which connects the two. If our surmise be correct, Mr Davis has conferred a greater boon on the district than he probably contemplated when he first stocked the Gungahline pond with gold fish.

Sydney Morning Herald, 31 January 1877
How The Public Are Mystified. /In 1840 I saw the Jugiong River filled with sand to its junction. That district had then been occupied by a handful of shepherds and stockmen only, who described the river as originally composed of long deep waterholes / Close to my home, Naas River joins the Murrumbidgee from a tier of high ranges to the west. Since the great flood in 1852 (perhaps commencing before), its numerous sources, then running in a kind of swardy beds, have now each washed out for themselves deep channels from 20 to 100 feet broad, and from 10 to 30 feet in depth – most of these scooped channels extending for miles. The clay part of these scourings continued melted up in the floods that by degree caused the ruin / What had been a succession of deep waterholes, is now a far broader but shallow sandy river – some sand is always visibly on the move, in flood-times doubtless a great deal. The whole of the Naas river has been changed, and the Murrumbidgee itself has been encroached upon, and similarly changed for miles below the junction; but above the junction its old character of very deep extensive waterholes continues. Codfish can exist in these deep waterholes alone; perch take their place as the rivers sand up.

Yass Courier, 30 September 1879
Anglers now obtain good baskets of fish from the Yass River. Codfish from 1 or 2 lbs weight to 15 or 16 lbs were caught in considerable numbers last week in various parts of the Yass River.

Argus, 29 June 1888
Introduction Of Trout Into New South Wales. Albury, Tuesday. Among the passengers by Monday night's express train from Melbourne were Mr. Campbell, of Yarrabumia, Queanbeyan, and Mr. John Gale, one of the members for the Murrumbidgee, who brought about 300 young trout, perch, and carp from the acclimatisation nurseries, Ballarat, intended for the tributaries of the Upper Murrumbidgee and Snowy Rivers, near Yass / yet, 10 years ago, a brother of his rode from Queanbeyan to Monaro with some fish in an air-tight pickle bottle, and the fish were alive and well on arrival at their destination.

Sydney Morning Herald, 23 April 1890
Wagga, Tuesday / It is believed that carp have become acclimatised in the river here, as one weighing over half a pound was caught in the Murrumbidgee last week, a short distance from Wagga.

Sydney Morning Herald, 9 September 1891
Gundagai, Tuesday. / E. Morley, of this town, caught yesterday some fish which are strange to these waters, but are believed to be English carp, and they have only been noticed here since the recent flood.

Sydney Morning Herald, 22 September 1894
Net Fishing. It is earnestly desirable that some attention be given to the depletion of the inland waters by wholesale net fishing. Take for instance the Tumut River. A few years ago it abounded in fine fish – Murray cod, perch, bream, &c., &c.. and anglers could always rely upon catching a fair basket in the season; but all this is now a thing of the past. Systematic netting from the debouchure of the river into the Murrumbidgee right up to Brungle has quite depleted the Tumut, and these nets prevent fish from ascending the river to spawn in the upper waters, as is their wont, and those that manage to get up in floods (the nets then having been taken out) are very few.

The habits of the Murray cod resemble very much those of the salmon – that is, they make down to the brackish water at certain seasons, and return at spawning time, ascending the rivers to the headwaters, there to deposit their ova, and when shotten they again descend. September is the month they may be expected about the district, and they continue running, first up and then down, until the latter end of April.

Sydney Morning Herald, 1 August 1895
Fatal Disease in Fish. Queanbeyan, Wednesday. An extraordinary fatal disease has made its appearance amongst the Murray cod, black bream, and perch in the Queanbeyan River within the last few days. It affects principally large fish from 4lb. down to 2lb. in weight. Numbers were found within the vicinity of the town dying and dead. The fisheries Commissioners suspect that the cause is a fungus on the head, and have asked Sergeant Nelson to report. The police are sending specimens to Sydney to-night to the commissioners. Two fish examined to-day disclose highly inflamed gills and a thick membraneous growth on the lower lip, but there are no other external symptoms of disease.

Sydney Morning Herald, 21 April 1904
Last week Mr. R. A. Hill, hon. Secretary of the Murrumbidgee Fish Protection Society, forwarded two small fish found in waterholes near Wagga Wagga to the Fisheries Department for identification. / “The fish is the spotted gudgeon (Krefftius adspersus)”.

Sydney Morning Herald, 1 December 1904
In The Trout Districts. / we experienced the most whole-hearted hospitality and kindly advice in his trout quest near Cooma. There are but few really expert fly-fishers in the town or district, but those few are as the leaven of righteousness in the lump of angling misdeeds. Everybody who can hurl a line into a river has caught trout, cod, bream, perch and gadopsis in the Murrumbidgee, but most do it with a hook baited with white grub, worm, shrimp, frog and other foods.

Sydney Morning Herald, 9 March 1908
Mysterious Fish Mortality. At Canberra, on the lower Queanbeyan River, a mysterious mortality among fish exists. Two specimens of the infected fish – a Murray cod of about 3lb weight and a black bream weighing something under 16oz – were both brought into Mr. John Gale, honorary inspector of inland fisheries. Both were alive. / In one pool or channel of the river fish of all sizes were dead and alive, ranging from a pound or two up to 20 pounds. They were all descriptions, cod, perch, bream, carp, but only one trout among the dead fish. Up or down the stream no dead fish were to be seen, except in the little arm or branch named. Shrimps were even affected. It is estimated that there must have been a ton or more of dead and live fish. / A couple of

years ago a similar mortality occurred among the fish in the Queanbeyan River a mile or two above the town... In both these instances, however, the mortality was confined to a small area and happened after heavy rains.

Narrandera Argus, 11 January 1910
MURRUMBIDGEE TROUT-COD
Mr. C. H. Wood, Secretary of the Narrandera Angler's Club, has received from Mr. D. G. Stead, the naturalist who recently visited Narrandera with the Fisheries Board, a letter of much interest to anglers. Mr. Stead writes that the trout-cod, now prevalent in the Murrumbidgee, is a species absolutely distinct from the Murray cod; nor is it, as its name would seem to imply, a cross between the trout and cod, for it has absolutely nothing in common with the trout of the genus Salmo. The trout-cod is really a species of perch, and Mr. Stead is enthusiastic as to its value, both as a table fish and affording good angling. With regards to the specimens of fish captured by the naturalist on his visit to Narrandera, he states that they were well preserved. Mr. Stead forwards Mr. Wood some interesting books on pisciculture, and offers, if suitable provision can be made in Narrandera, to stock some tanks with living specimens of fish.

Sydney Morning Herald, 13 September 1913
Cod-Fishing on the Murrumbidgee. / Yet one giant of the species caught by Mr. Smith, bookkeeper on Burrabogle station, Murrumbidgee, turned the scales at 200lb. This, however, was an extraordinary big haul. / My friend, Jim Jordan, most renowned of fishermen between the Eucumbene and the Bight, established an interesting fact in respect to the annual growth of the cod. While camped on the river some miles above Hay his catch one afternoon included a forty-pounder. As there were no callers – or travellers – to bestow largesse of fish on, Jim made a disc of tin, whereon he inscribed the weight of the fish, the date of liberation, and his autograph, attached to the fish, and set him afloat again. Two years after a brother fisherman caught him once more, not 200 yards from the scene of his first capture and release. Said Bill: "You were a long way out about the weight, Jim. Why it turned the scales at 60lb."

Queanbeyan Age, 26 January 1925
Piscatorial. Recently, in considerable numbers, quite a new variety of fish has made its appearance and become the prey of anglers in the Upper Murrumbidgee near Queanbeyan. Those who have caught it have thought it a cross between the trout and bream – commonly abounding, in the neighbouring waters, but is erroneously called perch. The new specimen is in reality the true perch, which has found its way from the lower Murrumbidgee, where it is common enough. It is distinguished from the bream, which has a thick leathery lip and a mouth devoid of teeth, while its scales are larger and the spines on its back much stronger and bonier than those of the true perch, which is of more graceful form and with comparatively small scales. Moreover, all the bream class are destitute of teeth, while the true perch possesses teeth in both upper and lower jaws. It is a delicious table fish, though lacking the peculiar toothsome flavour of the bream of our fresh waters. The true perch, also, is a better fighter when hooked, and affords capital sport to the angler.

Argus, 24 February 1915
Flood in Murrumbidgee. Fishing Extraordinary. Wagga (N.S.W.). / All day on Sunday dead sheep by the score, rabbits in hundreds, and great quantities of fish of all sizes, and occasionally pigs, were to be seen floating down the swollen stream. The water had assumed the colour and almost the consistency of pea soup, and the mud had the effect of partially stupefying the fish. As they floated down they struggled blindly and persistently towards land. The populace of Wagga and other parts held high carnival all day Sunday. Thousands of people lined both banks of the river, armed with all manner of weapons and nets for capturing fish. Many adopted the simple method of clubbing the fish on the head as they floated past on the outer edge of the stream. Some parties secured as much as 4cwt. and 5cwt. Of cod, bream, and perch, together with great quantities of shrimps and lobsters. Even people who had been intimate with the river for years were amazed at the

quantities of fish which were washed up. At Brachour Station one cod taken weighed 78lb. Numbers of others turned the scale at 40lb., 50lb., and 60lb. In addition to those taken, it is estimated that many tons of fish perished in the water.

Argus, 10 August 1917
Macquarie Perch. / With regard to Macquarie or eastern perch it is not to be compared in any respect with the golden perch. We only use it for cod bait up here. They are rarely got in the river as far down as Narrandera though the Goodradigbee up above Burrinjuck is full of them; in there the golden perch is rare.

Argus, 1 October 1920
Murray Fishes. Some interesting points in connection with the habits of Murray fishes were mentioned by Mr. J. H. Jarman of Narrandera, in recent conversation. While the trout cod, recognised in his locality as a distinct variety of sub-species of the Murray cod, and always commanding high prices from those who know its merit as a table fish are fairly common in the Murrumbidgee, he cannot find that it exists in the western rivers such as the Lachlan and the Darling. The Macquarie perch, while plentiful in the higher reaches of the Goodradigbee and in several other tributaries of the Murray, including the Goulburn, is never caught by rod or drum net in the Murrumbidgee near Narrandera. Mr. Jarman has satisfied himself, and his view is confirmed by the personal observations of professional fishermen, that the Murray catfish, much undervalued on the economic side, will, where the slope of the bank favours, work its way right out of the water to take a bait on dry land. Catfish. / An interesting point about these curious catfishes – much prejudiced by their name – is that, unlike most other fishes, they make a well-marked nest for their eggs, and keep close guard over them until the young are hatched and able to burrow into the mud of river bottoms for their own protection. While the eggs are incubating both male and female guard over them, moving just over or about the nest. When they are about due to hatch the female drives off the male, who, however, continues his sentry go in circles a little way from the nest.

19.6 Significant Extracts from the Annual Reports on the Fisheries of NSW

1902
In his book on the fisheries of this state, the late Mr. Lindsay Thompson states* that “one of the first, if not the first successful attempts to introduce new fish into New South Wales was made in 1888 by Messrs. John Gale and F. Campbell, of Queanbeyan.” The consignment here referred to was obtained at Ballarat, in Victoria, and included 300 yearling trout, 80 English perch and 40 “Russian” carp*. The fish were liberated in various waters in the southern part of the state (tributaries of the Murrumbidgee and the Snowy Rivers)./but Mr. Thompson has seemingly been unaware that three years previously two consignments of yearling perch were imported from Ballarat at the instigation of the Zoological Society of Sydney. *History of the Fisheries of New South Wales, by Lindsay G. Thompson, 1893, p. 22. † “Russian,” or “Crucian” carp: Cyprinus carrasius.

1905
Mr. John Gale, of Queanbeyan, who is an ardent enthusiast in matters piscatorial, obtained permission from Mr. A. H. Garroway, to collect English perch from a dam on his property for distribution in local waters, and was supplied with a net and cans for their capture and transportation in October. Consignments were sent to Mr. Edwards for liberation in Bibbeluke River, and to Mr. Campbell at Yarralumli, and seventy-two were brought to Sydney by Inspector Benson, thirty-eight of which were placed in one of the Centennial Park ponds and thirty-four in Kangaroo Creek, Port Hacking.

Experiments were carried out by the Superintendent of Fisheries Investigations in connection with Murray codfish eggs at Murrumbidgee River near Wagga Wagga, with a view to ascertaining whether they would be suitable for artificial propagation. Several fish were stripped and the eggs impregnated with milt successfully, and it was found quite practicable to artificially provide for, keep, and develop the eggs and obtain the fry for liberation, as in the case of trout.

The Mayor of Queanbeyan presided at a large meeting of residents to consider the closing of the season in the western waters against fishing generally . . . and advanced the reasons that trout had finished spawning in August, and cod and perch did not spawn till November and December.

During the former closed seasons for trout in the Upper Murrumbidgee River a good deal of line fishing was carried out ostensibly for the capture of cod and perch, which was lawful, but in reality for trout. To meet this difficulty, the whole of the waters of that part of the Murrumbidgee River, together with all its creeks, inlets, and tributaries upwards from the junction of and including the Umeralla River were declared closed against fishing generally, and by any method of capture, from the 1st of May to the 31st October, 1905.

1906
At the request of Mr. J. J. McJannett of Bungendore a net and fish tanks were forwarded to him, to enable him to catch cod in the Murrumbidgee and Queanbeyan Rivers, and transport them to Lake George. Mr. McJannett reported that efforts were made to capture cod in the Murrumbidgee River, near Michelago, but without success.

On Thursday, the 27th of December, 1906, Mr. Dannevig and I left Sydney by train to Goulburn, with the object of inspecting the waters in the Tumut and Monaro districts, and of fixing the site for a nursery trout pond at Talbingo/The river at Yass was very discoloured and slow running, and is not in this locality suitable for trout; some cod are occasionally caught near the town, and it is more suited for this species. The next stream of importance was the Murrumbidgee at Jugiong, and I was informed that very large cod fish are frequently obtained here . . . from Tumut to Talbingo the road proceeds along the banks of the Tumut River for several miles . . . although trout have been liberated in the main river and its tributaries no evidence could be obtained of the capture of any trout in the Tumut River, but cod are frequently taken from it.

1907
Badga and Umaralla Rivers have been very low, and storms have kept them discoloured. Both streams are well stocked with large and small fish (trout)/Perch are increasing in these streams, and very good catches have been made.

1908
In the beginning of March large numbers of fish were found to be dead and dying in Queanbeyan River in the vicinity of Canberra. The mortality affected cod, perch, carp, and shrimps, but only one trout was observed. The mortality was confined to a small area, and occurred after heavy rains which flooded the river and brought down deposits from sheep camps and other debris. It is considered that the impurities brought down by the freshes were responsible for the death of these fish.

1909
Mr. C. N. Hanlan very generously offered a limited supply of English perch to be obtained from a dam on his property at Queanbeyan, where this species of fish is plentiful, in the event of this Department requiring any, and was informed that his offer would be availed of if supplies are required.

1910-13
Dissemination of Australian bass / A large consignment of Australian bass was also taken to Temora for liberation in dams at the Government Demonstration Farm there. Altogether 1,112 yearlings were safely landed here, and these will, as far as possible, be kept under observation.

In regard to size, the Naturalist inclines to the belief that the average female Murray cod becomes sexually mature and bears ripe eggs at a length of from 18 to 19 inches, and of a weight of a little over 2 lb., and that the average length of trout cod at maturity is 10 inches, with a weight of about 6 oz.; the length of golden perch (yellow-belly) at maturity being about 11 inches, with a weight of from ½ lb. to ¾ lb./Dixon's dam[1] was visited by the Naturalist, the late Chairman of the Fisheries Board, and the Inland Commissioner, and it was found that is was heavily stocked with Murray cod and other native fishes, and that trout cod is as abundant in the Murrumbidgee as is the Murray cod. Rocky Waterholes Lagoon[2] was next visited, and it was found to be a fine permanent water of good depth and teeming with fish-life.

The fish taken at Deniliquin in August, 1909, locally called "trout," which were similar to specimens already received from Narrandera and Wagga Wagga, as "Murray cod" has been found to be distinct from either of the species mentioned, and has been designated "trout cod." The Naturalist[1] is of the opinion that in the trout cod has been discovered the long-lost "Oligorus mitchelli" of Castelnau, the very existence of which has been generally doubted. Freshwater catfish, of which there is an abundance throughout the whole of the western waters, is expected to become of considerable vale as time goes on. Already numbers are sold in the Melbourne market.

Author's Footnotes:
1. The 'Dixons Dam' referred to may have been on the Murrumbidgee River near Wagga Wagga and owned by early settlers of the region.
2. Rocky Waterholes Lagoon is located near Narrandera.

1914
During October valuable work was performed in the transplantation of a consignment of ovigerous Murrumbidgee crayfish (Astacopsis spinifera) from the Murrumbidgee River at Bringagee to the McIntyre River at Inverell. The crayfish were captured by Messrs. W. J. Hill and F. Archer, professional fishermen of Narrandera, and kept in wire-netting cages until ready for dispatch. / The consignment consisted of 161 mature crayfish, 8 to 18 inches in length, 51 being ovigerous females, whose eggs were at the time actually hatching, 47 females whose eggs had been hatched, and 63 males./They were liberated in four different places, viz., 4 miles below Inverell, and 1 mile, 2 miles, and 4 miles above the town. None were lost in transit.

Mr. W. J. Hill, a professional fisherman of Narrandera, offered to place his horse and sulky at the disposal of the Department, and to accompany the officer undertaking the work, piloting him through the district. This was faithfully performed, the Murrumbidgee River from Berembed Weir to Carrathool being inspected and tested as to the fish and food contained in the stream itself and its principal outside channels. This work occupied twenty-one days. Every assistance was afforded by Mr. Hill, whose knowledge of the country proved invaluable. A number of large and permanent lagoons and waterholes in the anabranches of the Murrumbidgee were visited, also many smaller lagoons, &c., which were fast drying up, and in some of which thousands of fish – Murray cod, trout cod, Golden, Silver, and Macquarie perch and catfish – were already dead or dying, illustrating the appalling waste of valuable food perpetuated by nature in dry seasons. This has been an exceptionally dry year in the Riverina, and many waterholes that have never been known to dry up are lower than the oldest residents have seen them before, and unless a considerable fresh comes down the Murrumbidgee River within the next three months, most of these will dry up also.

Reports from several places on the Murray River System indicated great mortality among fish. One such report came from Wagga Wagga; on investigation the cause was found to be the sudden inrush of muddy water, due to an exceptionally heavy thunderstorm, containing a large quantity of surface soil, dead leaves, eucalyptus bark, &c., which polluted the stream to such an extent that it is assumed for a time the consistency of pea soup. Many of the older and weaker fish were suffocated by it. This occurred at Wagga in November, the loss of fish being very great.

A scheme for the utilization of nature's waste has been outlined and will be put into operation next season. It is intended to collect from drying-up waterholes as many as possible of the young of various food fishes – Murray cod, trout cod, golden, silver, and Macquarie perch, &c., - and convey them to the nearest permanent water, where they will be liberated. A trial is to be given to this project early in the new year.

Arrangements have been perfected for the transplantation early in the new year of the Murray cod, golden and silver perches to the Cataract Reservoir and the Nepean River, at Penrith and Wallacia, when a number will also be obtained for liberation in the Prospect Inlet Observation Ponds.

A request was made by the late Irrigation Commissioner that an investigation as to the quantity of fish life in Burrinjuck Reservoir should be made. This was undertaken with the co-operation of Mr. Henry Dawson (late Inland Fisheries Commissioner).

Heavy rain in the upper waters brought the Goodradigbee, Yass, and the Murrumbidgee Rivers down, causing a lot of muddy water to flow into the reservoir, hence a thorough investigation could not be made. Prior to the rain, however, tests, made with a meshing net about 80 yards long, resulted in the capture of very few fish, those caught being Silver and Macquarie Perch. Hauls made with a fine mesh specimen net captured very large numbers of miniature fishes, including gudgeons, atherines and smelts, also shrimps and insect larvae. While not being convincing, the tests go to show that the water is not by any means well stocked with edible fishes, while fish food is plentiful.

A consignment of 1,037 Murray cod, Golden, Silver, and Macquarie Perch was transplanted from the Murrumbidgee River to Burrinjuck Dam. About 500 of the same kinds were liberated in the Nepean River near Penrith and at Wallacia, also a like quantity in Cataract Reservoir, while a small number of each kind were placed in the Observation Ponds at Prospect. This work was carried out with very little loss, the fish arriving in excellent condition.

The work of transplanting Murrumbidgee Lobsters to various waters was curtailed, owing to floods in the Murrumbidgee River destroying many of the captured crustaceans and rendering further captures impracticable. / The few lobsters secured were sent to the Nepean River and the Umeralla River, where they were liberated in good condition. Four lobsters died (two out of each consignment) en route.

1917

Upwards of 90,000 fry of valuable food fishes from 1 to 13 inches in length, including Murray Cod, Golden, Silver, and Macquarie Perch, Catfish, and River Blackfish, were rescued from overflowed lands on the Murrumbidgee River Flats and liberated in permanent waters at a cost of less than £100. Owing to cold weather it was not deemed advisable to attempt the transplantation of the fish in the various approved waters.

When conducting hatchery operations, and also when collecting small fishes from overflowed lands, a number of small Murray Cod were marked with identification discs and released in various places in the Murrumbidgee River. Two of the Murray Cod liberated in the vicinity of Bringagee during the month of October were recaptured in December close to Narrandera, having travelled upstream a distance, rounds the bends of the river, of approximately 150 miles. Further important work in this direction will be undertaken as opportunity offers.

Murrumbidgee River near Tarsus / Murray cod are plentiful. E. Crisp, Tarsus.

1918

Upwards of 30,000 fry of Murray Cod, Golden, Silver, and Macquarie Perch, Catfish, and River (Blackfish?- WT), and 1,638 mature fishes of the same kinds were rescued from over-flowed lands on the Murrumbidgee River flats and transplanted in Burrinjuck Reservoir. Sixty-five mature fish of the same kinds were transplanted in the Temora Demonstration Farm Dam, and 35 mature Golden Perch were supplied to Mr. J. Woolard, Trunkey Creek, to stock a dam on his property.

During May and June upwards of 45,000 small Murray Cod, Golden, Silver, and Macquarie Perch, Catfish, and River Blackfish, and over 2,000 mature fishes of the same species were rescued from the overflowed lands at Bringagee, and transferred to the permanent waters of the Murrumbidgee River.

A Murray Cod, which was marked for identification with a disc bearing the No. 522, on 11th October, 1917, near Bringagee, was recaptured close to Narrandera on 11th December, 1918. Another Marked Murray Cod, No. 502, liberated near Bringagee on 23rd October, 1917, was recaptured near Narrandera on 18th January, 1918. Two Murray Cod marked at about the same time and place, Nos. 534 and 538, were recaptured within two miles of Narrandera in November and December, 1917.

Two hundred and seventy-four Murrumbidgee lobsters were collected in the Murrumbidgee River, near Carrathool, and transplanted in various streams throughout the State, viz., Reedy Creek, Warialda, Hunter River (three localities), Umeralla River, Severn River, Belubula River, Nadjigomar Dam, Nepean River, and a dam at Castle Hill.

1919

A total of 380 Murrumbidgee lobsters, captured in the Murrumbidgee River, near Carrathool, were transplanted in various waters with the State. One hundred and twenty lobsters were released in Burrinjuck Reservoir, and the remainder in different localities in the Queanbeyan, Hunter, and Macquarie Rivers, and King's Creek, near Inverell.

1920

Investigations conducted on the Burrinjuck Reservoir did not disclose such plentitude of fish as to justify wholesale exploitation, and the restrictions limiting operations to the use of one line with one hook for each person were renewed for a further period.

Three hundred and fifty Murray lobsters (or Murrumbidgee crayfish) were captured in the Murrumbidgee River, near Bringagee, and transplanted; 300 in Burrinjuck Reservoir, and 25 each in the Macquarie and Gwyder Rivers. The majority of the crustaceans were females, carrying well-developed eggs, many of which would hatch out shortly after liberation.

1922

Murray Lobsters—A transplantation of these crustaceans effected in 1914 in Beardy River near Dundee has proved successful, specimens of young lobsters sent for identification were found on examination to be Astacopsis spinifera, the kind liberated.

1923

Three hundred and twenty-eight Murray lobsters were collected under contract in the Murrumbidgee River and transplanted in Burrinjuck Reservoir; twenty-five of these crustaceans were released in Macquarie River near Dubbo.

Investigations show that the Murray Cod and other Western fishes released in Cataract Reservoir in 1916 are now acclimatized and reproducing naturally; these fish are numerous all over the reservoir.

1925

Burrinjuck Hatchery for Indigenous Fishes—Construction of this hatchery was commenced; it is expected to be ready for use next spawning season. Prior to commencement a record flood in Murrumbidgee River submerged the Burrinjuck dam, also the hatchery site; a new site above flood level was consequently selected.

Murrumbidgee Lobsters—Two hundred and fifty of these crustaceans collected on lower Murrumbidgee River were transplanted in Burrinjuck Reservoir, 25 in Wambool, and 25 in Bathurst waters.

1929

Transplantation of live fish under Ministerial authority was satisfactorily performed by Mr. G. J. Preston of Quandary, who reports that on April 22nd, 1929, he collected in Murrumbidgee River 40 catfish, 50 Murray cod and 107 perch from 2 to 5 inches in length and transplanted then in Mirrool Creek.

1930

Since the weir below the outflow of Yanco Creek was completed, the flow down the Murrumbidgee River has been reduced, the water being diverted into Yanco Creek: as a result aquatic plants have in many places almost overgrown the previously open river, to the detriment of operations by river fishermen.

1933

The activities of licensed fishermen at Burrinjuck Reservoir have been causing the Department some concern, by reason of the fact that during the winter months great numbers of trout are caught in their nets, and these, which are usually dead when the nets are lifted, are commonly sold along with other fish./Commercial fishing was, therefore, proscribed in the Murrumbidgee River below its junction with the Goodradigbee River (which has been closed for some time against all commercial methods), and the use of nets in Yass River restricted to the waters below Woolgarloo.

19.7 Murrumbidgee River Catchment Oral Histories

The following oral histories (OH 37- 51) mostly discuss the Murrumbidgee Catchment.

OH 37

An Interview with William Hill of Bringagee

Mrs. Marge Longford of Griffith, a descendent of commercial fisherman William Hill, possessed a typed transcript of an interview with William Hill recorded by an unknown person. The header of the notes carries the initials: TCR.DS suggesting that it may have been conducted by T. C. Roughly and David Stead. The text is reproduced without amendment below.

NOTES ON THE MURRAY COD. GOLDEN PERCH, SIVER PERCH, CATFISH AND THE ENGLISH PERCH COMPILED FROM INFORMATION SUPPLIED BY MR. W. HILL AT NARRANDERA 8th AND 9th OF JULY 1940.

Artificial Propagation of Murray Cod

The male Murray cod is stripped into a spoon which is then stirred through the water, about one inch deep in a shallow enamel dish. The male fish is not easy to strip and only two or three drops of milt will come away at any time. The milt, if ripe, quickly diffuses through the water, but if it adheres together in streaks it is useless for fertilization purposes. Although the amount of milt capable of being extruded is comparatively small it is ample to fertilize great quantities of eggs. The eggs are stripped from the female into the dish at the same time or immediately after the stripping of the male, and the water is kept agitated by shaking the dish in order to distribute the eggs evenly through it and to prevent them adhering to each other and sides of the dish. After about 3 or 4 minutes the eggs lose their adhesive properties. About 30,000 eggs are obtained from a fish weighing about 2½ pound. The female is quite exhausted by the stripping but is recovered in 24 hours. If, in the stripping process, blood comes away from the eggs it appears to be an indication that they were not quite ripe, for development ceases about 24 hours after fertilization. In the more forcible extrusion of milt, however, it is not uncommon for some blood to be extruded; this milt may retain its fertilizing properties unimpaired.

Dr. P. O. Lethbridge who assisted Mr. Hill in microscopic examination of the eggs and spermatozoa, when interviewed at the Narrandera hospital, that the spermatozoa of Murray cod are actively motile and that they remained alive in a dish of water at room temperature for 7 hours. The fertilized eggs can be kept without damage for about 48 hours in a can placed under a dripping tap or agitated to ensure sufficient supply of oxygen. As soon as possible after fertilization they should be placed in the hatching cages. Those used by Mr. Hill measured 14" X 14" X 14" they consisted of a cubical wooden frame covered by galvanized wire gauze of 14 meshes to the inch. Each of these cages if capable of hatching about 12, 000 eggs, and eight of them are fitted into a large rectangular cage, 6' X 3' X 1½' deep, which is also covered with wire gauze, of 14 meshes to the inch, on each side of the wooden frame; this double covering helps not only to retain the fry which may work through the gauze of the smaller cages but it prevents shrimp from preying on them by thrusting their claws through the openings. These hatching cages are moored in the stream and the natural run of the current ensures a continuous supply of fresh water.

In water with a temperature of 68^{o} F the fry hatched out in 120 hours (5 days). At this temperature the resulting fry appeared to be soft and it was found that more robust fry were obtained when the temperature was somewhat lower and 8 or 9 days elapsed between fertilization and heating. The dead eggs were removed once a day by means of forceps. When the fry hatch out the egg membranes must be removed expeditiously otherwise they quickly develop fungus. In order to accomplish this the cage is raised and lowered quickly; the fry remain at or near the surface; in this position the can be quickly removed by means of a small net. Sediment in the river water was found to be very inimical to successful hatching. Consequently, two or three times a day, each small cage was lifted and shaken to liberate as much as possible of the sediment which was caught up in

the meshes. In a hatchery where the water is filtered trouble from this source would be avoided. The newly-hatched fry are reddish in colour and tend to gather in heaps in the corner of the cage. The yolk sac is absorbed in about 21 days and the fry then begin to feed. At this stage they were fed on the flesh of shrimps broken up finely between the fingers, or on the gonads of mussels treated in a similar manner.

At Bringagee fully roed Murray cod are usually found from about the 26th of September to about the end of the third week in October. At Wagga Wagga fully roed fish are found about a month later; here Mr. Hill has found ripe males as late as the end of November. When about to spawn one of the fish (thought by Mr. Hill to be the male) forms a depression on the sand: this varies from about 12 inches to about 5 feet in diameter and up to about a foot deep, the size probably being governed by the size of the fish forming it. After deposition and fertilization of the eggs one of the fish (again thought to be the male) maintains a guard over the eggs to protect them from the depredation of other fish and shrimps and, by the movement of its fins, to maintain the eggs free from sediment. On a good spawning ground the depressions may be so numerous as to meet at their edges. Spawning takes place usually when the river is high, the areas chosen being shallow beds at the edge of the stream where they are covered by from 3 to 4 feet of water. A favourite site is at or adjacent to the projecting edge of a bend in the river. If, after the deposition of the hatch out, the whole of the eggs will be lost, and Mr. Hill states that since irrigation was extensively adopted a marked fall in the river has frequently occurred in October owing to the heavy demands on the water at this time for irrigation purposes. It is just a this period that the Murray cod spawns and the losses that have occurred from this cause are considered to be an important factor in reducing the quantity of fish in the Murrumbidgee River.

Propagation of Golden perch
Golden perch eggs fertilized in a glass jar at Mr. Hill's home at 6.45 pm on October 25th 1937 began to hatch out at 8.45 pm on October 27th (50 hours) and all were hatched by 9.15 pm; the temperature of the water was 72°F. An oil globule near the anterior extremity maintains the newly-hatched fry in vertical position and for some time after hatching it swims continuously from the bottom to the surface and from the surface to the bottom. This oil globule eventually moves back along the ventral surface and when located here the fry is able to swim in a horizontal position. It is very active and makes towards the light. At 9 pm on October 30th the fry (which are very small) were seen to be actively feeding, apparently on infusoria, which occurred naturally in the water. They measured 3/8 inch long 96 hours after hatching. No special effort was made to rear them beyond this stage.

Male and female Golden perch are easily distinguished, the females being much more rotund. The stripping technique is exactly the same as Murray cod. Unlike the Murray cod the Golden perch does not construct a nest or depression, the eggs being pelagic. The Golden perch spawns in November and in March and April if the river is high enough. Mr. Hill is of the opinion that it will not spawn if the river is unduly low. Mr. Hill has found male Golden perch fully roed when 8 inches long and females when about 2 lb. in weight. Fully roed female fish are usually found, however, when from 5 to 8 lb. in weight. Dr. Lethbridge examined the spermatozoa of Golden perch and found them to be non-motile.

Like those of the Golden perch, the eggs of Silver perch are pelagic, and spawning occurs during approximately the same periods, i.e. during November and March and April, when the river is high. Spawning takes place during the early morning or evening. Male Silver perch have been found fully roed at a weight of 4 to 5 ounces, and the females at a weight of about a pound.

Breeding Habits of the Freshwater Catfish.
When the Catfish is about to spawn the male constructs a nest consisting of small stones and sticks which it will carry (apparently in its mouth) for a distance of up to a quarter of a mile. Over these spawning takes place and

the male guards the eggs against the inroads of other fish and shrimps and prevents the deposition of sediment by continually swimming around them.

English Perch (Redfin).
The roe of the female English perch is unpaired and grows to a very large size — about one third of the total weight of the fish. Mr. Hill has never seen a male English perch.

General.
Mr. Hill is of the opinion that Murray cod are not as plentiful a formerly, though there seems to be no noticeable diminution at Bringagee where he has been fishing since 1906. In addition to this area Mr. Hill has fished practically along the whole length of the Murrumbidgee and Lachlan. Several reasons are given for the reduction in numbers of Murray cod. As stated preciously, the exposure of spawning grounds containing developing eggs caused by the lowering of the water for irrigation purposes have caused much loss.

Large Murray cod are responsible for great losses amongst the younger Murray cod and closure of certain lengths of the river against netting are a serious contributing factor for very large Murray cod do not migrate to any extent and closed waters form a sanctuary for them. Here they reduce the numbers of smaller Murray cod very greatly. Mr. Hill is emphatic that he can catch more fish in open waters than in closed waters; indeed, he maintains that he will guarantee to do this and in prepared at demonstrate it to us at any time. In this contention he was resolutely supported by Mr. F. Archer, who was present during portion of this interview, and who has been fishing for Murray cod since 1891 (49 years). As example of the greater productiveness of open water, Mr. Hill cited the Murrumbidgee at Bringagee which has been fished with nets unceasingly by a considerable number of fishermen without any noticeable diminution of supplies. In contrast with this the examples of the closed waters adjacent to Narrandera and Wagga Wagga were cited; here Murray cod are notoriously scarce. In addition, closed waters afford protection to English perch, which cause widespread destruction of young cod. Mr. Hill strongly recommends that all closures against netting be lifted with the exception of those waters situated within one mile of each side of weirs.

The English perch does damage in creeks and lagoons where it congregates in far greater quantities than in the main streams. The best way to reduce the numbers of English perch is to commercialise it. Every effort should be made to popularize this fish as food; at the present time Mr. Hill states that it brings from 4d. to 8d. per lb., and, in skinned and fried in batter, it is very palatable. Serious losses are caused by large numbers of Murray cod fry being carried along the irrigation channels to the Leeton and other areas where irrigation is carried out. When the fields are drained the fry die in large numbers. Prior to the construction of Burrinjuck Dam and the extensive adaptation of irrigation that followed, large numbers of lagoons retained water for years at a stretch, whereas now they go dry practically every year. Heavy mortalities of fish of all sizes regularly occur as a result.

Although a small percentage of fishermen respect the closure during the months of September, October and November, the majority ignore it. Large numbers of amateurs also fish throughout the closed period. These statements were endorsed by Mr. Archer. There is much illicit net fishing in closed waters. Although the Fisheries Regulations prohibit unlicensed fishermen from using more than one set line at any one time, breaches of the regulation are very numerous. Some anglers use a great number of lines than licensed fishermen, and the fish that are captured are sold locally. Italians from Leeton and Griffith are particularly serious offenders in third regard. Most fish caught by anglers are undersized and they are rarely liberated. In some places the quantity or undersized fish caught by anglers reach serious proportions.

In February, March, and April 1918, fungus developed on Murray cod in considerable quantities, and during the following year hundreds of tons of fish died. (This fungus may be regarded as a secondary symptom of some

adverse conditions operating during that period). Although cormorants do some damage to Murray cod the pelican is regarded as a far greater pest. Mr. Hill considers the regulation size and mesh (4 inches) of drum nets to be quite satisfactory. Some nets, however, are made with the funnel too small, consequently large fish are debarred from entering them. The funnel should not be less than 10 inches square. Drum nets are most efficient when baited with Silver perch or carp, preferably the perch; larger Murray cod are caught in baited than in unbaited nets. It is usually found that, if there are 20 to 30 Silver perch caught in a net and a large Murray cod enters it, the whole of the perch are likely to be destroyed.

Line Fishing
When asked to account for statements so frequently made by amateurs that they cannot capture anything like so great a quantity of Murray cod as formerly, Both Mr. Hill and Mr. Archer stated that the main reason for this is that the fish are now more "educated"; in other words they bite much more shyly than formerly, consequently much finer tackle must be used. Thirty or forty years ago the Murray cod was taken freely on the heaviest of tackle, but it would be useless to fish with this now. Mr. Hill uses cutty hund of 6 or 9 thread. The Murray cod approaches to within about 4 inches of a stationary bait and then sucks it into its mouth. It bites with great caution.

As a rule earthworms are found to be the best bait, but during the winter months, when the Murray cod does not bite freely, the most attractive bait has been found to be centipedes. These are found under the bark of trees and will remain alive, when stored in a box, for about eight days. They give off quite a pronounced odour, which appears to have an attraction to cod. From one to four centipedes are used according to the size of the hock. Fish up to 65 lb. in weight have been caught on centipedes considered the best; the crayfish, particularly after it has cast its shell; and yabbies at certain times of the year, are all bitten freely. The best burley is a crushed-up crayfish thrown into the water at intervals. Fish gut is not attractive to Murray cod. Mr. Hill's most successful method of fishing is to use a springer about 4 feet long and about as thick as a lead pencil, out from a young gum tree; this is stuck in the bank at an angle to lean over the water and a short line, two or three feet long, is suspended from its tip. Two hooks are used, joined together so that the point of one is above the point of the other, and with both hooks baited; the lower one just breaks the surface of the water.

Mr. Hill and Mr. Archer agreed that the Murray cod is a very shy fish and the water should be disturbed as little as possible when angling. If Murray cod are disturbed and frightened they will make for a deep hole and remain there. On the Murrumbidgee there is practically no commercial fishing during the winter months. On the Murrumbidgee the last spawning season (October, November) was the best for eight or nine years. English Perch and carp do not associate; the perch preys extensively on the carp. The largest Murray cod caught by Mr. Hill weighed 91 lb. when gutted, and the largest caught by Mr. Archer weighed 84 lb., ungutted. 16/7/40.

OH 38
David Ryrie of Michelago Station was interviewed in April 2006 at an age of 60 years.
When I was young I used to fish a lot for the brown and rainbow trout. If you used worms, well there was an abundance of Macquarie perch. I used to pick some of them up on the fly. By then the cod were scarce, but regularly caught up here. Also sometimes caught were a few silver bream or grunter. They would do a run up the river and the locals would catch them down here in Michelago. There were no yellowbelly or Catfish caught here.

In the early days before the Snowy scheme, in the 20s and 30s at Bredbo and at Adaminaby there were cod. It was known that there used to be many cod in the Cooma gorge that looked different to the normal cod. They were not common in my time. The cod used to move up into the Colinton Gorge. The cod, they would get trapped in the pools between the falls. In the past at Bredbo and Colinton there used to be many cod. They

were caught up to 12 – 13 pounds. Back then we hadn't heard about the Trout cod. The cod there were different, were more grey in colour, a bit blue around the head, no yellow in them. All the cod I caught there were that colour, looked like that. Down at Tharwa in the Gigerline Gorge I used to get both types of cod at that time. The Murray cod were there, they were quite different, different in shape and a lot more yellow in them.

I used to catch them at the Colinton Gorge back in the 196's, about 5 miles downstream from Bredbo. There was a couple of big obstacles, big ledges, a two meter drop in low water. At the bottom was a basin pool, the fish used to congregate there, the cod used to move up to there in spring, they could get over it in a big flood. I used to catch them there in April or May when the water was low. They were mainly about 4 to 6 pound, the biggest one I caught was the 11 pounder I've got mounted, the big one. I was trying to catch a big cannibal brown that lived there, so I used a big yabbie, and when I hooked him I thought I had the big brown on. That's the biggest one I caught there. There was a 35 pounder taken out of there in the 1950s and there was another big one at Bumbalong a bit downstream that was stuck on a fence after a flood, he was about 25 to 30 pound. He was a bit sniffy when they found him.

In the 1960s I've heard of cod being caught in the Murrumbidgee at Bolaro, that's near Adaminaby. There were some big holes in the river there and they were picking a few up. That's the furthest up the river that I've heard of the cod. That was just before the dam went in that they were catching them. In the Tumut River the cod certainly went up to where Blowering now is. I can remember the old fly fishermen telling me how in the 20s they would catch cod in the Swampy Plains River. But they disappeared by the end of the twenties.

OH 39

Gordon Hain of Cooma was interviewed in April 2008 at an age of 85 years.

I'm 85, was born in Cooma. After the war, about 1955, 56, I used to catch a couple of cod each night, out at Bolaro. It was not long after the war, there was a bloke that had a property out there, Dixon was his name, he's dead now, very few people knew about it. It was a rough track down to the river; you'd need a four wheel drive to get into it. It was all forest, I was out there the other day, it nearly made me cry it's been cleared, it's all bare now. We used to get them up to around 8 or 9 pound, nearly every night we'd catch cod. We'd put in handlines and we'd catch two or three, sometimes more. And beautiful brown trout, and red belly black snakes! We'd go out there on long weekends and holidays and always caught cod.

We used to get in the Murrumbidgee what we called the Silver perch[1] *they weren't real common, we used to get one or two when we were fishing for trout. The perch were up to 3 or 4 pound and they were good eating. I used to get them out at Tarsus, that's north of Cooma. Just the other side of Bunyon was Tarsus, that's where we used to get the perch. In the area I fished the river hasn't changed that much at all; down further towards Canberra it has. But up here it hasn't changed much, and up at Bolaro it's still not very populated.*

1. Gordon indicated that they had rounded tails so the fish are identified as Macquarie perch.

OH 39

'Tiny' Egan of Queanbeyan was interviewed in July 2008

I had an uncle Ron Berry who built Anglers Reach Caravan Park near Adaminaby. He and Tommy Smith who worked there used to go fishing in Tantagara and catch Macquarie perch. That would have been in the late 1960s; after it filled they used to catch good numbers of them, that was in the Mussler Creek Arm and the 'Bidgee Arm. They caught quite a lot for a few years after it filled. They used to go up into the same area in the 50s and catch them in the river before the dam was built.

I grew up at Michelago and we used to ride on our pushbikes and go fishing in the 'Bidgee there and at Colinton and we'd get the Macquaries there. We used to get a few Trout cod there, the last one would have been twenty two years ago. My old man used to go up round Yaouk and catch the Macquaries there too, that would have been in the late sixties. Around Adaminaby there used to be a lot of cod. If you talked to any of the old blokes up there in the sixties they used to talk about all the cod they used to get. Back then they wouldn't have known if they were Murray cod or Trout cod, they were just cod.

OH 40

Terry Rutzou of Canberra was interviewed in February 2008, now retired from the ACT Conservation Service.

I was born in Corowa, grew up at Balldale, fifteen miles away, I'm now seventy seven. I moved to Wagga in 1942, did a trade as a carpenter. I then moved up here, took up a job here at the hatchery, helped get it going. At the time I was mucking around with trout, that's what everyone was interested in at the time. The Trout cod it was only in the later years that we had anything to do with them. Allan Weatherly got some down in Beechworth, out of Lake Sambell, he brought back two big ones, they were the first. He had one in a bath, it was dead and it would have been twenty one or twenty two pound. He said to me 'What do you think of that?' Years ago the old blokes down at Corowa, back in the depression, they called them a blue nose, I can remember some of them talking about it, saying that they had just caught a few blue nose. They were caught further down the river too, down at Swan Hill.

There was a group of anglers here, they started going out catching them, bringing them into the hatchery, we had this sort of hatchery out at Kingston, at one stage I had eight of them there. The blokes were bringing them into me from a gorge out near Williamsdale, they started catching a few of them, Keith Shields, Gordon Winter. There was a gorge here called the Red Rocks, just above Kambah, they were catching a few Trout cod down there too at the Red Rocks, there was some come in from down there.

To us they were something new, in particular Keith Shields was dead keen on bringing them in. Nothing much was done with them so eventually I put them all back in at Angle Crossing. The biggest would have only been three or four pound. There was one caught right up, just down from the wall of Tantangara, I can remember someone getting one there and bringing it in. I know they were further up the river, there was a bloke here working on the platypus, Smythe was his surname, he was with the CSIRO, working up at Bredbo, and I'm sure he ran into a few Trout cod up there, that would have been in the early seventies.

The Macquarie perch were up in Googong, they were there in big numbers. Gradually the flow started to muddy up the gravel beds where they used to spawn. They eventually cut out in there once the dam filled, up the top end of it became all muddy and they couldn't spawn on it. Another place they used to get them was down at Retallack's, at the border where the river runs into NSW. There was a big hole there, at least the best part of a kilometre long, you'd get a few in there, but mainly the Silver perch. We never got Catfish there, but the platypus certainly were the go there. I was mucking around down there on the platypus with Merv Griffiths.

OH 41

Dr. Bryan Pratt of Canberra was interviewed in June 2009 at an age of 71 years.

I've got to think about it! I'm 71, grew up in Sydney, then went to Adelaide, then Canberra. I first came to Canberra in 1965. I was a pathologist, I did my Bachelor's degree at Sydney University and then my PhD at Adelaide University. I ended up working at the Department of Health in Canberra then went to teach at the Australian National University. After a stint of university life I went back to the public service as Director of the ACT Parks and Conservation Service and was there for 12 years.

The Golden perch in the early days I think they got up the Murrumbidgee just up to Canberra. The locals called all the fish 'the perch' and I asked people whether they had the rounded or the forked tails. The impression I got was about 1911 the Golden perch came up the river on their annual upstream migration and couldn't get past where it had been blocked off at the newly-sealed Burrinjuck Dam. Prior to then there had been Golden perch, Silver perch and Macquarie perch in the Murrumbidgee but after 1912 there were only Silver perch and Macquarie perch. After 1969 when they were first restocked in Burrinjuck Pat Pola caught the first Golden perch out of the Murrumbidgee above the dam and I caught the second one. To my knowledge there was no mention of Catfish in the river prior to Burrinjuck being completed in 1912. An old fellow told me about catching a few Catfish in Burrinjuck in 1921 after they had been stocked in 1917.

The Silver perch were common enough that over at Uriarra the Retallack's said that at the turn of the century they kept the perch alive in cages to feed the shearers. They also caught quite a few cod. I can't remember their names, the father and grandfather, but the son was Phil, and it was Woodstock Station. They were Silver perch, Phil was adamant about that, they had the forked tails. The Silver perch kept in better condition than the Golden perch they said, though there is doubt whether they were really Golden perch or Macquarie perch. They said they had the rounded tails. I suspect they were mostly Macquarie perch and a few Golden perch when they did their run upstream. They had all sorts of different names for them, the white eyes, red eyes. The Macquarie perch and a few silvers went all the way up to Dromore Station (located at the junction of the Numeralla and Murrumbidgee River) *and the Macquaries beyond.*

When I arrived in Canberra the impression I got from the locals was that there were two types of cod, with a smaller, different cod in the rapids, especially upstream from the ACT. I can't remember the locals generally having a name for them; some I think mentioned a Trout cod. I had heard the name 'bluenose' used for them in Victoria and introduced it to the area; it had never been a local name. About Phil Retallack's property at Uriarra they weren't particularly common. In the past they said they got a few in the rapids there, but they were mostly Murray cod at Retallack's. Mostly they talked about them in the upstream rapids. The memories for me, I can see the habitat right now where the Trout cod were caught, and rocks were always a feature and the flowing water.

Upstream from the ACT is a dead area which I never understood. There was a seasonal migration of Silver perch upstream to Canberra. They would disappear in March and come back up in September. A few would get up into that area upstream to Bredbo, nearly to Cooma. You would also get the very odd Macquarie perch in that stretch to the Numeralla. Between Tharwa and Bredbo were beautiful rocky holes and I flogged it and it was rare to get anything, a few trout, till you got to where David Ryrie was, and then you would get a few cod there, and from there to the Cooma Weir it was trout, trout, trout. Upstream of there you would get a few Macquarie perch particularly about half way between Cooma and Bolaro. I caught some Macquarie perch at Stuartfield just below Tantangara in 1969 on a brown nymph while trout fishing, I got half a dozen over several trips. There was also some in the Numeralla. At the old bridge Keith Shields got a big one, there was a big Macquarie perch under the bridge in 1965. They tried to get it with bait, fly and lure and in the end he got it with a big boulder on the head. Yes, he was a character. It was big for that area, about 2½ pound.

In retrospect all the cod caught upstream of the ACT in the Murrumbidgee River could have been Trout cod, I can't say with any certainty that I saw a Murray cod up there. Sammy Madigan got a six pound cod under the bridge at Bolaro on a green nymph and there was a 23 pounder caught on a red Celta about 2 kilometres downstream in the Quarry Hole. Looking back the impression I have was that they were Trout cod. I remember the fish that David Ryrie used to get and they usually had the long and thin look about them. I think the ones he caught were mainly around 4 to 5 pound with a few bigger ones around 11 to 15. I clearly remember him bringing in photos of two of the fish to the Murrumbidgee Lodge in Cooma, he brought the photos in one night

and they had the speckles all over them. He caught the two of them on a black and red matuka, a size four, that was a pretty big fly. I think over the years he caught a fair number of them.

I'd say ninety nine per cent of the Trout cod that I saw brought in to the hatchery came from the gorge at the Sandwash Hole at Williamsdale. Gordon Winter and Keith Shields fished it and they might have got 14 to 16 of them there. The fish in 'The Canberra Fisherman' was one of those caught by Gordon Winter out at the Sandwash Hole. There was some that I know about also caught down at the Red Rocks gorge. All the fish I caught in the Murrumbidgee below the Molonglo Junction were Murray cod and all the cod I caught out of Burrinjuck were Murray cod. Merv Griffiths from CSIRO was out at Phil Retallack's Hole, he had 35 platypus tagged and was tracking them; we'd go out each night. Quite often we would get cod in the nets and they were all Murray cod. I only saw one fish down there which I am pretty sure was a Trout cod, it was caught by Pat Pola, a small fish, it would have been two pound. That was just downstream from the Molonglo Junction in 1969. There was a small specimen caught in amongst some trout by Doug Sells, he was a linesman for the NSW Electricity Commission. He was supposed to have brought in a Trout cod and he caught it at Yaouk. I can't remember specifically seeing that fish but I heard about it, and he certainly knew what they were. Terry Rutzou says he saw it, so it was a Trout cod. I know it was caught at Yaouk. There might have been one or two that were brought in from Bredbo.

We sent three to five shipments of fish, live Trout cod, to Narrandera that was in the early 1970s. The first lot died from misadventure, the second shipment died supposedly from an overdose of methylene blue that caused them to run out of oxygen. Then another batch died from misadventure. I suppose there was 3 to 5 fish in each shipment. It was about that time that I spoke to Don Francois about it, told him to go get his own if he couldn't look after them. We were just depleting our stocks here. I told him he could go out to Cataract Dam and Avon Dam and that there was a stack of them out there, and hybrids. A colleague caught 36 out at Cataract in one weekend. So Terry is quite correct, that's what we did, Terry was under orders from me, we put the last 8 Trout cod we had back out at the Sandwash Hole. The hatchery has since been demolished.

We weren't happy that they had all died at Narrandera; they were in perfect condition when they left here. The ones we sent there were about two to three pound. I saw one eight pounder caught and I saw one later that went fifteen pound, it was caught at the bottom end of the Sandwash Hole, at Riverside, Les Brown owned it. I knew John Lake and spoke to him on a number of occasions. As I heard it John got most of his Trout cod in the upper Murray around Tintaldra. Anglers Digest, Roger Hungerford was the editor, and another magazine, Fishing and Outdoors, there were also stories in them of Trout cod being caught from Tintaldra about that time. The black and white photos I saw of the Trout cod from out there, it would have been the mid 1960s, some of the Trout cod were quite large, twenty odd pound.

In 1969 Keith Shields and I caught some Macquarie perch on Taihape Tickler and other flies in an eastern-flowing stream, the Mongarlowe. This was the first record of the fish on a fly there and a colleague of mine at ANU X-rayed them and I noted they had one less vertebrae than those from the Murrumbidgee River. It was assumed they were a new sub-species. The Macquarie perch were caught in 1969 in the Mongarlowe River just upstream from the junction with the Shoalhaven River, at Charleyong. We had later reports of similar fish from two other tributaries of the river, Warrambucca Creek and Northangera Creek. Local anglers in Braidwood were aware the fish were there but incredibly asked me to come and give a talk to the local fishing club on how to catch them. All of ours were caught on fly but we heard of others taken on Celta and worms. The fish were not common and we only discovered them when they were aggregating for spawning, in October-November. At other times anglers would put in a whole day for perhaps nil, one or two fish.

The Macquarie perch from Burrinjuck they'd go up the Goodradigbee and the Murrumbidgee and they'd gather in groups, and they were absolutely stupid you could catch them on anything. In the Goodradigbee there were two to three holes and they would stage in them when going up. In the Goodradigbee they gathered in groups up to Wee Jasper and a little bit further upstream. In the Murrumbidgee they would gather in the Jews Hole, about half way between the ACT and Burrinjuck, and they'd gather in Retallack's Hole, always under Willow trees there on the left hand bank looking upstream. The same thing would happen in the Queanbeyan above Googong, about 1975, up there they were completely stupid. Vic McCrystal wanted to catch his first Macquarie perch and I took him out to Googong. In one cast with a green Celta he got his Macquarie, photographed it, and went home. I did the same thing with Ross Chisholm when he was editor of Fishing World. We kept quiet about where they would congregate as people would have cleaned them up, they were beautiful eating.

During my time in the area they were never abundant; they were a small proportion of what was caught. If you fished in Burrinjuck in 1965 to 1970, if you got 300 Silver perch, you'd get 3 to 5 Macquarie perch in amongst them, always small, about half a pound. The only big ones were in the Murrumbidgee, from 2½ up to 4 pound, I caught them mostly on 'Tiny Tads'. Up Cooma way, up around Yaouk they were quite a different colour, distinctly brown, and up there they were only small fish, about a half to three quarters of a pound. Downstream in the Murrumbidgee they were black.

In 1967 I started to notice the Silver perch in Burrinjuck, with blood under their scales, dead or dying, and I noticed it was most common in November. And there were a few unexplained cod dead in November that were in otherwise good condition with not a mark on them. The Silver perch had blood under their scales either dead or still alive. The redfin had been below the wall at Burrinjuck for many, many years. There was always something peculiar about the redfin below Burrinjuck, they were never big. I think EHN kept them in check, that always puzzled me. There was such a density of fish there that the virus knocked them out before they had a chance to get to any size. I think it was always there restricting the population. Then there was one caught in Lake Burley Griffin, a sick fish. Hec Horsburgh got it, he might have actually recovered it from the shallows. That was at about that time in the late sixties, then they turned up just upstream of Burrinjuck. They had been illegally introduced into Lake Burley Griffin. I suspect that it was the EHV virus that caused the collapse of the Silver perch population, the overall demise of the Silver perch. The collapse has been just about total. Later on there was an illegal stocking of Catfish, they were introduced into Sullivan's Creek, at Yowani Golf Course and the dam in the Canberra racecourse. The creek it ran through the golf course and the Catfish, incredibly, are still doing well and breeding each year. We stocked them into Lake Burley Griffin but they never really established.

With the Macquarie perch I suspect two things, EHN and a lack of water flow at crucial spawning times. Above the ACT I was always puzzled about the dearth of fish above the Sandwash Hole, till you got up to around David Ryrie's country. There were goldfish in large numbers, an odd trout, a very odd Macquarie perch and an extremely rare cod. It wasn't silted then, it's only silted in recent years from Dromore Station downstream of the vegetable farming. Back then it was a good, clear rich river. It's still a mystery why there was nothing there, back then it still had a good flow of water. De-snagging didn't cause the Trout cod population up there to disappear, it was never de-snagged. I suspect there was something widely used in agriculture that got into the river and caused a problem. As part of your research you should look at the effect of agricultural chemicals and sheep dips and their effect, they might have had a big impact.

OH 42

Norman Moore of Moruya was interviewed in May 2008.

I lived in Molonglo till I was aged eight years old, then moved to Canberra. It had been a concentration camp for the 1914 – 18 prisoners of war. The old concentration camp was set up as a workers camp when Canberra was going ahead. I was born in Queanbeyan in 1930 and my father he came out from Belfast in Northern

Ireland with his brother John in 1926. My oldest brother was two when they came out. I remember dad coming home from work; it was the horse and dray days really. The few trucks around had solid tyres. Anyhow when he came home from the government powerhouse, usually about 5.30 in the summer time, he'd go fishing down in the Molonglo and we'd have trout for tea, it was so simple. You'd also get the perch and cod in the deeper holes. It was near the stepping stones crossing, between Molonglo and Pialligo near where the aerodrome is. I remember once there was a fresh on and there were some boys up ahead of us and they dragged in a forty pounder. I am sure there were sixty to 80 pounders taken out of the Molonglo at Lloyd's Hole.

Above that hole the river got shallower and you got trout all the way up to Captains Flat. As far as I know at that time there were no cod above Molonglo then, there was all those shallows that stopped them going further. The perch went up as far as the cod, they were only around about half a pound. In those days the water was so clean you could drink it and swim in it, no worries. In the deep holes in the Molonglo, there were definitely forty pounders caught. I did hear of a 100 pound cod at Fyshwick but I didn't see it. I can't remember any small cod being caught out of the Molonglo. You just had this one big swimming hole, Lloyd's big hole was near the market gardens and below it was a rapid. On the bottom end of the hole was where the stepping stones were that formed the crossing in the old days. The forty pounder must have come down the river, he couldn't have come up at the time as the water was trickling over the rocks and very shallow. There was in the Cotter River excellent trout fishing below the dam and large trout were caught up to 28 pound.

From Molonglo they used to go out at Kambah Hole on the Murrumbidgee, and one particular weekend neither my dad or his mate got a bite all night. Then a storm came up, his mate was out shooting ducks. In the finish they were getting the fish on bare hooks, the pair ended up getting 365 fish. These were mainly perch and trout. We just called them perch, they were black in colour and had small mouths. Further down in Burrinjuck there were grunters, but the perch were different. We'd go out to Taemas Bridge out near Yass and fish in the backwaters of the dam, you'd get out there and the grunters were common. They used to feed in a big circle, working their way round from shore to shore you'd be catching them on one side and the blokes on the other bank wouldn't be getting any, then they'd catch them over the other side. They were only about half a pound or so, they always seemed to be about that size. Bloomfield property, near Yass, was owned by a relative of Princess Dianna. My brother Sam caught a forty pound cod on a Saturday afternoon. The station manager let him keep the fish alive in the bath till leaving for home on Sunday afternoon. An afterthought. Did the princess use the bath tub later on when she visited? I do know that she did once stay there! I think the name was 'Kid' was linked to Dianne. In the Murrumbidgee when you fished near Canberra the perch they were common, you'd get there in the afternoon and you had to be quiet, they were a shy fish. I never heard of yellowbelly or Catfish in the area. You would see in the 'Bidgee out from Canberra were these small finger sized fish, you'd see three or four of them, they were very, very small, darting about.

The redfin, were out in Lake George, I wrote a story about an old miner out there and he told me about the cod and redfin being windrowed up on the shore at one time when the lake was drying up. There was never any talk of redfin in the Molonglo or the 'Bidgee when I was there. The redfin out of Lake George, were full of worms. Out on the Yass River, in Brooks Creek, where it crosses the Federal Highway near Lake George a friend of mine used to get trout. There were tiny holes in amongst the rushes, but all the fish were riddled with worms like the redfin in Lake George. We'd go out to Childowla below Burrinjuck, we'd mainly go there for the trout. I remember early on my dad seen these skeletons in the water jammed in between the rocks. There were big granite boulders and you could step out on them, the water would be rushing through. Anyhow he saw a skeleton and he thought it was human and he fished it out and was that of a huge cod. He talked about seeing these skeletons and he reckoned the big cod used to come up out of the big holes down in Gundagai and they would get trapped in these boulders.

I left Canberra about 1948, those stories in my time were from about 1935 through till when I left in 1948. I came back home in 1951 from Wagga and we went out camping with my brother out at Kambah and a bit of a storm came up. The cod started biting and I think we got a 12 or 15 pounder and smaller ones. That's how the cod used to go, you wouldn't get a fish for weeks and then the atmosphere would change, it would get stormy down in the Burrinjuck area. They would bite if the river rose. In the 'Bidgee there was quite a few 4 to 5 pound cod, I can remember my brother putting quite a few back. That was the last fishing I did there, about 1951, the top one was a 12 pound cod and we got two or three others, they were 5 to 6 pound cod.

OH 43

Denzil Ballard of Gundagai was interviewed in July 2007 at an age of 77 years.

I was born on the Murrumbidgee River, my parents had a dairy farm just up from the junction of the Tumut River. My grandfather and grandmother were there. They said they used to catch mainly the Silver perch and the Macquarie perch, that's what was most common, and the cod. When we were kids we used to sit on this old oak tree, catch the bream on a Stringybark sapling and a float. We used to get both types of bream, the Silver perch and the Macquarie perch, up to 5 pound, mostly around the pound. The Macquarie perch it would be a long time ago since I caught them, be about 30 years since the last. There used to be plenty about here. The Macquarie perch, they're beautiful to eat, and the Silver perch.

We used to catch plenty of cod too, Murray cod, round about the 15 to 20 pound, the biggest one I got was 75 pound, on a setline. I can just remember a few Trout cod, we used to call them the rock cod. They were about 3 to 4 pound, up to 10 pound. That was when I was only a little kid, in the 'bidgee, around the junction and above it. They're a very aggressive fish, easy to catch. They are now stocking the Trout cod, I think they're breeding. When I was a little boy you had a job to catch a yellowbelly. Before that there was plenty that's what I was told, now we get a few here again. The Catfish used to be here in the lagoons in Gundagai itself. We used to get them up to 3 to 4 pound, they disappeared before the bream went, a bit before. I've been president of the Gundagai Angling Club, we've been stocking Morley's Creek with Catfish, they're breeding there.

I used to fish a bit above the junction of the 'bidgee, in the Tumut, the river used to stop running before Blowering went in, long holes of still water. Up in the Adjunbilly Creek, it runs into the Tumut, the Macquaries there was plenty of the Macquarie perch and plenty of the Blackfish, we used to call them slipperies. The Blackfish we used to get them there by the sugarbag full, up to 12 inches, be 60 years ago, that was when I used to fish there. There was the odd cod in the creek, they would poke up the creek.

I can't understand what happened to the Silver perch, there was heaps of them here, and in Burrinjuck. You couldn't put a line in for them, then they went off. We very seldom get one now in the river. The redfin, I first seen them about 20 years ago. They come in pretty thick for a while, bred up. You'd catch them, they'd be full of fish most of the time. And the European carp, they buggered things up a bit. I first saw them in '74, we had a big flood then, they seemed to come up the river. The river's got colder since Blowering went in. It's silted in places, but it's still pretty good.

OH 44

Bob Brook of Gundagai was interviewed in August 2007 at an age of 84 years.

I'm 84, grew up on the river in Gundagai, 2 mile down near Nangus Road. We all fished, things were pretty tough them days. Me and me cousin, he was up from Sydney, we pulled up a 40 pound cod. Well I put my arm down his throat and he took all the skin off it. Rocky Knob was where we got him.

Cod was the main fish; you had a good feed from them. There was plenty of bream and slipperies. The bream were a bit bony, but eatable. We'd get yellowbelly, now and then you'd fluke a Catfish. The redfin they'd take

the bait. Anything that was edible. The average size of the cod I reckon was 10 to 15 pound, you'd get 5 pounders I suppose, but a 10 pound cod was a feed. We used to use sparrows and that for bait, even the young ones without the feathers on them. Years ago you would go a mile across the river in a still flood, now it's just a creek.

OH 45

Harry Hill of Tumut was interviewed in October 2007 at an age of 81 years.

I've caught small cod in the river here and I have heard of fairly big cod being caught in the holes in the Tumut River well up into Kosciusko, up above Talbingo. They were caught in the big holes about 30 kilometres above the Talbingo pub, the Murray crays also cut out up there, just before the Yarrangobilly River. These blokes were fishing it back in the 40s, they used to go in behind Batlow, drive out through the Bago Forest, they used the logging roads. From there they used to walk in the last few kilometres, it took them a few hours it was so steep. That's about where O'Hare's Bridge is now. They mainly caught trout, big trout 3 to 4 kilograms, but from time to time they would catch the cod. Each time they would fish 3 to 4 miles of river, fishing the holes, they were big rocky holes, fishing with spinners. Two of them are dead but I caught up with one from Cooma while back. There were Murray crays up about ten kilometres further than Lobs Hole, that was their limit.

I caught a few cod, they were undersize, 12 to 15 inches long in the Tumut River right in the town, near the bridge. There was a bloke here that used to set drum nets in the river, you could hear the motor start up after dark. There was also what we used to call the bream; some called them bream others called them perch. As a kid I used to go out in the Tumut or the Goobarragandra, we'd catch as many of them as the trout, be close to seventy years ago. It was a big one if it weighed a pound, about one and a half pounds was the biggest, you got them mainly on worms. There was another fish we called the slippery or slimy they were in the Gilmore Creek and other small creeks, you'd catch them in the slack water. People used to catch them on a hair pin, it was a big one if they were ten inches long. They had scales but they were too slimy to notice, people would put them through a mincer, they were beautiful to eat.

The gudgeon, some people called them a native trout, were in the high streams. As soon as the trout got in they would clean them out. They had great big eyes and spots on them like a small trout. I saw them in the tributaries of the White River, you'd get them in streams less than a meter wide. Duck Creek running into the Geehi was another up the top above the waterfalls, Valentines Creek was another. In the Tumut there was brown and rainbow trout, more rainbows than browns, much, much more, particularly the streams up the top. I can remember in the Goobarragandra finding dead trout, when it got too hot for them, you would seem caught up on the snags. Once the Snowy Scheme went in well that changed the Tumut, the cod and bream disappeared. In some years you could swim in the top of the Tumut and it wouldn't be cold at all, but after the Snowy Scheme it got colder.

I can't remember Catfish, grunter or yellowbelly here in the river at Tumut; they would have been further down where it's different. I can remember catching a lot of grunter out of Burrinjuck. I used to go out to the Goobarragandra to get the bream. We went on our pushbikes 8 miles out of town, crossed the river at Lac Ma Lac, that's where I used to fish. The last bream oh, since I caught one would have been 1941, I can remember going out with a mate and we caught two or three bream and a trout. My auntie wanted to eat trout; she thought the bream looked too much like a saltwater fish to eat. The bream were beautiful, the best fish to eat. Anyhow I had to do a deal with my mate and swap the bream for the trout.

I also had a talk to Jack Bridle, a Tumut identity. He's now over 90, but with failing sight and hearing. Jack remembers cod being caught in the Tumut, as far upstream as Lobbs Hole, the junction of the Tumut and Yarrangobilly. This would have been pre-war and maybe in the 1950s, but not since the Snowy Scheme changed

the Tumut River regime. Some of Jack's mates did a lot of fishing for cod, mainly with set lines, tied to a short springer. The Tumut River was a mix of fast water running over stones, rapids, then big, deep holes, possibly up to four meters deep and a hundred meters long. Farmers on the river often had their own drum net in, but caught more platypus than fish. He said the cod used to move up the stream in summer, they were more migratory.

A mate of Jack's caught a 60 pound cod below the junction of the Tumut and Goobarragandra Rivers in the war years. He had to go to Sydney so got Jack to put it in the brine room at the Tumut Butter Factory. Jack was a cream carrier who collected cream from dairies along the river. Jack's father-in-law caught some good fish. He'd get a large sheet of paper, draw around the fish, colour it in and paste the 'photo' on the kitchen wall. He had a 'gallery' of about fifteen fish. At one time, about the war years, a number of cod were found dead in the Tumut River. The following bit is taken from the book 'The Way We Were – A Collection of Reminiscences by Tumut's Senior Citizens", Bob Brown's story: "There were quite a lot of perch and cod in the Little River. I often enjoyed going fishing when I was a kid." The Little River is the Goobarragandra River and the time was about 1920.

OH 46

Harry Laney of Wagga Wagga was interviewed in January 2008 at an age of 78 years.

I was born in Wagga lived here for 78 years. My grandfather used to catch cod in town here right behind the Black Swan Hotel, out of the bidgee, he'd bring them home in a cart. Me dad was a fisherman, but it was a different sort of fishing back then than the sort of fishing today. Me and me brother in law would go out fishing to Collingullie and we'd have a wheat bag full by morning.

In the river when I was a boy there was everything here. There was the silver bream and black bream, types of grunter there was heaps of them. I used to go lower down the river to Carathool and we had a cage in the river, it used to fill up with the silver bream. The silver bream the biggest we ever got was 7 ½ pound and we would catch a lot about 2 to 3 pound. They were in the 'bidgee and the Old Man Creek and a lot in Burrinjuck. There was one year when Burrinjuck come over, and there was thousands of little bream all dead at Berembed, that would have been over 20 years ago, I don't know what killed them. They've been scarce ever since.

There was the white eyes we used to get them in the Old Man Creek and the river here in Wagga, they weren't as common as the silver bream. They were up in Burrinjuck too. The biggest white eye I seen was 3 ½ pound up at Wee Jasper, I got this big fish, it was the most beautiful I fish I ever seen. They were a top fish to eat. The average one we would catch here would be 8 to 10 inches long; you'd go out at night and catch them. We never got white eye at Carrathool, down there it was mostly the bream, yellowbelly and the cod. The yellowbelly at Wagga there was heaps of them, the biggest I got was 13 to 14 pound but they were caught to 23 pound, there aren't so many great big ones around now.

The cod 75 pound was my biggest. Little cod not really, I can't say there was ever a lot of little ones around, you'd get odd ones on a line not many. Ten pound was the average, bout as long as your arm. The best bait was them green tree frogs. We used to catch cod on mussels; we'd dive in the North Wagga Lagoon to get them. There were Trout cod here. We reckoned there were three types of cod the Trout cod, the river cod which was a Murray cod but longer and another Murray cod that was short. The Trout cod were about 7 to 8 pound, we never caught that many then in Wagga, it would be over 50 years when they went, longer, we caught them as kids. The Trout cod there seemed to be more of them about Windamarra, seemed to be more up the top end; they were as common as the other cod there and at Wantabadgery. I never seen one out of Burrinjuck or at Carathool. The Catfish, you'd catch them over in the North Wagga Lagoon, but the last ones I seen there were about 40 to 50 years ago. They were around here, caught up to 4 to 5 pound, pound, pound and a half

was the common size, we used to just skin the things. They got real scarce 30 years ago. The little Blackfish you'd catch them in the Old Man Creek, the river, there was heaps around. They were only a little slimy thing. In the lagoons all the redfin were there, they were everywhere. Me and mum and dad we would go out to Old Man Creek and we'd get 30 to 40 redfin, we'd get cod too. You'd catch the redfin on Bellbrook Wobblers, catch them on everything.

The river, this is what happened. The bigger Burrinjuck got the worst the river got. We've never seen the river clear again. Out of the Tumut the river is as clear as glass, but out of Gundagai it gets dirty. When we were kids it was clear as glass, we used to go spinning all the time. Now it seldom gets clear. That's the biggest change. It's got lower, and it has silted out.

OH 47

Rod Cockburn, proprietor of the Compleat Angler in Wagga Wagga was interviewed in April 2008.

I'm 53. The Macquarie perch there was always the odd few here around Wagga, but the main area was up towards Burrinjuck, they were very common up there, we used to catch quite a few on lures up there. We didn't chase them as a target we were after the trout and cod, and Golden perch, but they were good to catch. A kilo and a half up to two kilos was the size of them, they were all big. I'm assuming we didn't get the smaller ones because we were using lures, they would take the smaller lures. We didn't use bait up there. It would have been 20 to 30 years ago that we were catching them, back in the seventies and they were quite common. It wasn't like we were getting odd ones, we were getting two, three, four, five Macquarie perch every trip. We very seldom kept any. There was quite a few around Jugiong and Gundagai, but we caught a lot from Chindowla up to Burrinjuck. Childowla is I suppose about 10 mile by river down from the dam wall.

That would have been about the tail end of them when we were getting the Macquarie perch, about twenty years ago they fizzled out and by fifteen years ago they had totally disappeared. I'd put it down to the flow regimes of the dams changing. A lot of the species up there, the cod, silvers, even the trout, disappeared. About then the carp became prolific. Fifteen years ago the carp were in massive numbers, and then they got bigger. But I think the biggest problem were the changes to the flows. They became more inconsistent, they went up and down more often than the old irrigation releases. Since then there has been a brown slime on the rocks, it never used to be there, and the brown slime is getting greater and greater.

There was also Macquarie perch at the time in the upper reaches of the Tarcutta Creek, up above the highway bridge, there was a few caught then when we were bait fishing. They probably came up out the 'bidgee and disappeared about the same time. The Tarcutta Creek is now just a mud puddle; I haven't seen the Macquaries since. There is still a few pockets of them up around Tumbarumba in the Mannus Creek, the locals still see them about, odd ones, the locals reckon they used to see them in schools. I can't recall ever catching a Trout cod years ago. I didn't know about them back then, but I am sure I never caught any. From Wagga up to Gundagai most anglers would say that they would catch 70% Trout cod and 30% Murray cod, and at Gundagai it would be even higher. Down from here, around Narrandera it would be the other way around. Ninety three centimetres is the biggest one that's been caught around here. They've got a different range and habitat than the Murray cod. They're more in the rapid runs, which you get up from here towards Gundagai. They are also more active in the cooler water, we are just starting to see the catches increase now. In the peak of summer they quieten right down, in autumn and early winter they get most active, that's the season for them. I think in summer it is just too hot for them.

For many years the redfin seemed to disappear from the river, but there's been plenty in the lakes. But the redfin seem to be coming back, we're starting to get a few above Wagga, that could be a disaster, even though they are good eating. There used to be a lot of goldens in the river, but we haven't really got them now as there

are no floods, they need the floods to breed. Everybody enjoys catching the Trout cod, they are great to catch, but there is a bit of an imbalance with only them being stocked in the river. They should stock some goldens since they can't breed and probably some Murray cod as well. The Murray cod don't need a flood to breed and we seem to be getting a lot of little Murray cod these past couple of years. It's probably due to the water temperatures being warmer out of the dams. Traditionally in summer the water here from the releases is 16 to 18 degrees, but recently it's been 27. In that way the drought has been a blessing, with the warmer water the cod have been breeding. But we've also got to get back to having better flows with some flooding to get the river healthy again.

OH 48

Jim Bailey of Narrandera was interviewed in January 2008 at an age of 77 years.

I'm nearly 77, born in 1931, I've been at it fishing since I was ten. I lived with my uncle Arthur Charles, dad was killed when I was four, he taught me how to fish. Back then well in the river was cod, miles of cod, yellowbelly, silver bream. I did catch once the Macquarie perch. We were fishing over in the irrigation canal and we caught this bream, it had big white eyes. My uncle said "that's a Macquarie perch". We caught one another day in the Murrumbidgee itself. My uncle said they were plentiful in the river in the early days, I haven't seen one since, that was in the forties when we got them.

In the early days below the regulator you could catch Catfish. All we had was a Rangoon rod about twelve foot long, a bit of line that was half the length of the rod, a cork and some worms. We called ourselves "Murrumbidgee whalers"! The Catfish we got would have been three to four pound on average, they were up to eight pound, three foot long. Big ones. The last ones I caught here was about '58, the year I got married. After that well the Griffith area in the Tom Bolin Swamp they were still there on the Hay Road, they were small there. Barren Box Swamp at Griffith you'd always get a keeper. They were muddy to eat out of the swamps. In '59 I caught nine Catfish in the lagoon over in the common here in Narrandera, there was a few there then, two, two and a half pound, that was about it for them. Yeah they disappeared pretty quick. Out in the creek at Morundah, they still catch an odd one out there.

My mate Percy Willis junior who I grew up with, and I, had homemade canoes before we could afford a boat. We put in heaps of time in the bidgee. I got to know a bloke Jack Collins, a pro, and I used to go out with him when he used to check his nets. He caught heaps of bream, miles of yellowbelly, miles of cod. At one stage he told me that there was such a thing as a Trout cod, that the old blokes had told him about them, that there had been some here. He might have got that from old Wally Hill down the river, down at Bringagee, he was known as Wally, he started out up here. Until they brought one down here at fisheries and put it in a tank I had never seen one, they are very distinctive. Never saw one in Jack's boat, I never caught one, nobody else I saw had caught one.

In the fifties we had a high river and the bream were up to five pound, we called them the grunters. At that time there were heaps of what we called the "GT Monaro" green frogs, they were green with a yellow stripe down them. Every one you put on your line you got a big bream. But after that they started to deteriorate. The point is I think it has to do with the state of the river itself. Last year I caught two or three lovely big silver bream and let them go, they're protected now. When I was young there was plenty of them, always come home with half a dozen, round two to three pound. We didn't have deep freezers to keep any more and we didn't need them, you could catch them anytime. The yellowbelly there was plenty around in years of flood or high rivers. The biggest one was eleven and a half pounds, the average would have been three to four. I saw an aboriginal man one day he had a yellowbelly in this sugar bag, the tail was sticking out of the bag! It was big and fat, I don't know what it would have weighed but it was the biggest I ever saw.

The cod well there was never a time we weren't out on our bikes with a couple of lines each, we never came home without cod. Oh, around six to eight pounders, there was plenty of bigger ones, less in later years, 88 pound was the biggest I got, its head weighed thirteen and a half pound. I caught that one on one of those old split cane rods on a green floppy. I don't remember at any time lots of little ones, cod, there were the odd ones from a pound and a half to two pound. The best two baits were live carp and the bardie grubs out of the ground or the witchetties out of the trees, either. The redfin, well we were fishing in the 'bidgee near the common and we caught this fish, old Perc, Percy Willis senior, said he'd never seen one before, it was in the late forties. When we got home he tried to scale it! He made a few enquiries and was told that it was an English perch. Next season after that, be after 1946, we were at this beach, and there was this line of fish a yard wide swimming in the shallows, thousands of little redfin, that's how thick they were. They became like a noxious weed. They started to deteriorate when the carp come in the area. My wife and kids reckoned they were the best fish of the lot to eat. Gradually they started to disappear. I reckon they ate themselves out, they ate everything that was moveable in the water.

One of the things I've noticed about the river is it's all silted up. We used to go out spinning in the early days, we once spun up twelve cod from eight to twenty pound, that was in a Saturday afternoon. We went out the next Sunday morning and got ten, that was before I was married. I have been back there heaps of times since and it is all silted up. It started well before the carp got in, but they blame it on the carp. Back then in summer the river was beautiful, it felt like a warm bath, in summer it would run eight feet high, always lovely and warm. After the introduction of Blowering dam it altered the 'bidgee substantially, during the irrigation season the river would be running at ten to twelve feet and colder, it would give you goose bumps. The banks all started falling in, the trees too in places in summer where I used to be able to walk along. The river used to be only that high in flood times in winter, not in summer. There was a time when the fishing wasn't real good, but I was still capable of catching a cod most times. It would be in the mid-sixties to the seventies, but since then I think the fishing has improved. The cod have come back but not as good as when I was young.

OH 49

Mac Hardie of Darlington Point was interviewed in May 2008 at an age of 76 years.

I'm 76, I was born in Darlington Point, the Hill brothers used to be out here fishing. When I was a boy it was mainly yellowbelly and cod. We used to get a lot of Catfish in years gone by, but not in the river. The Catfish, oh well, they were not so much in the river, mainly in the lagoons and creeks. They were caught up to 12 pound, but 4 to 5 pound was a good one. I've heard about their nests but never saw one. The grunter they were always here but nobody ate them. The grunter were up to 6 to 7 pound, well some people ate them, but not many. The yellowbelly, oh well, I suppose the common size was 3 to 4 pound, they were pretty common, I've heard of blokes hear catching them up to 15 pound. The cod, 6 to 7 pound was common, I've seen them up to near a hundred pounds, but the big ones weren't much eating, there was not much flavour. When I was young there wasn't a lot of little cod in the river, they were all an edible size. I didn't do a lot of line fishing, I'd just roll a wire net in. If I fished with a line I'd put a set line in. There was an odd Trout cod about they'd come down from the mountains, it was only on rare occasions that you got them, well that's what people thought. One would be caught and they were different, and it would be shown about to show what one looked like. The ones I saw were 4 to 5 pound, and it would be fifty odd years ago when I saw the last. The Macquarie perch, another type of bream? We'll I never saw them, there was a silver bream which was like the grunter but silvery but it was no good to eat either.

The redfin didn't really come in till the sixties then you could catch them on anything, red wool, a bit of rubber tube. The carp then come in about forty years ago. In the years that the redfin were about you got another mongrel fish the tench, they were full of little bones. The Catfish I haven't heard of any here for a few years. If you go out to the Lachlan in the weir at Bally Rogan, near Lake Cargellico, they still get them there. The creeks

don't run here like they used to, that's the reason; they were pretty well gone by the sixties. I haven't heard of them catching many Silver perch for a while. The changes, you wouldn't think it was the same river today. Every winter there'd be a flood or at least it was high. I was a sleeper cutter and if I didn't get the timber out by May I'd be sitting on my arse for months. When it was in flood you could even catch the fish out on the high ground with a gill net. Everybody had a drum net or a gill net back then, nobody recognised it as so illegal. Since the carp come in the river has never been clear. When I was a boy you could dive under and go spear fishing. It never gets clear now. The only time it ever used to get muddy was when you got heavy rain upstream. In summer it would be clear, you could see the bottom. There used to be big sandy beaches here, on every turn there was a beach on it with deep water on the opposite side. I don't think there is enough water in the river now to bring the sand down. There is still fish around, in the Coleambally area they get a lot of cod and yellowbelly out there, even get them out of the channels with pitchforks when they drop the water. Lyn reminds me the last time I went fishing she caught a cod and I didn't. The professionals say bardie grubs are the best bait. I had bardies, she had shrimp. I reckon the juices from my bardies attracted the cod over to her bait!

OH 50

Marge Longford of Griffith was interviewed in November 2007.

William James Hill, well he was born in Narrandera, went to school, married and had 11 children. In 1922 he moved to Bringagee and bought a station at there. He artificially inseminated cod for the first time ever. He lived till his eighties and died in Narrandera. He and his sons, they were basically professional fisher people. When granddad died the four boys fished on the farm and sold fish in Griffith. I can remember him talking, telling his stories about shifting the fish. I can remember my grandfather talking about taking fish to the islands, which I don't know, it could have been New Zealand or even Fiji. He brought back a doll from the islands which we still have.

OH 51

Noel Denson of Tumut, Formerly of Carathool, was interviewed in June 2008 at an age of 70 years.

I was seventy back in April, we lived out at Carathool. My dad, Frank Denson, was a professional fisherman, and I was too. I left school before I was fourteen. My pro license was to give dad more nets, we were allowed ten drum nets, ten gill nets and two hundred hooks per license. Back then, I'm talking about the early fifties, that was before they buggered the rivers with all the dams and weirs. He had only started as a pro a few years before that, say 47, 48, full time, but he grew up in the area and was a real fisherman. He knew how to catch fish, where to set nets in the river. We always looked upon fish as money, three schillings for cod, two and six for yellowbelly. I knew the Hills from Bringagee, there was Walter, Wilf, Ted out at Darlington Point, Norman at Bringagee. They were great friends with my parents, great mates with dad. When I was a kid I had a holiday with Norman, they were some of the greatest fishermen.

You see the Catfish are gone. We could catch Catfish by the bucket full, but because of the cold water from the dams they're gone. About 75, 76, that was the finish of the Catfish. You could go down late in the afternoon with shrimps or worms and catch them one after another. I suppose the average was 3 to 4 pounds, we did catch the odd one up to 5 to 6 pounds, and there was a lot that were smaller. They'd get in the gill net and they were harder to get out and there were no sales for them. There was millions of them there in the river, if you fished just out past the reed beds. And in the lagoons. All the lagoons would have a fresh in them every winter and spring, sometimes three or four times, and they were also full of Catfish and yellowbelly. I've seen the nests of the Catfish in the river, in the shallow sand on the outskirts of the reed beds. The Catfish sort of sits in them and moving his fins he moves all the little grains out of the nest. That was also the case with the silver bream, there was thousands upon thousands of silver bream down there. They disappeared though there are odd ones being caught now. Most of them were 2 to 3 pound though I have seen them up to 6 to 8 pound. I caught one that size down there in the late 70s. I seen this fish coming towards me on the top of the water and grabbed

him. He was only out of the water for two minutes and he died, he was obviously sick, I didn't eat him. Talking to an old local he thought the grasshopper spraying was killing them, they used to eat a lot of grasshoppers the bream, they feed on the surface on them.

We never came across the Macquarie perch down there, they were more or less up in this part of the 'bidgee. The last one I caught here in the Tumut River was about thirty years ago. There wasn't that many left around here when I first moved up to Tumut, about 1960. The old fellas talked about there being an abundance of them both here in the river and lagoons and in Burrinjuck. Dad and my grandfather and uncles used to catch heaps of them in the Tumut area and over at Burrinjuck. But I never saw one at Carathool. When I lived at Carathool I caught two trout, out of a cold-water spring coming out of the bank, with a landing net. And I was once fishing at the Carathool bridge and this fella caught a trout there though there was a fair bit of flooding at the time. I can't say I ever saw a Trout cod at Carathool, we used to catch a short fat cod and the one with the longer body, but I have now seen Trout cod and I am pretty sure none of them down there were Trout cod. Up here in the higher country, apparently years ago they were in abundance up here, that's what some of the old blokes here said. There was a lot of Murray cod around here too, but to a lot of old blokes cod were cod. There was odd ones in the Gilmore Creek. I seen dad catch a cod out there about 4 to 5 pounds and a friend used to catch cod up to 8 to 10 pound out of it. He caught them about 12 to 15 kilometres up the creek from the river. I can't say which type they were.

Well yellowbelly we used to catch them by the bag full. We used nylon gill nets and when we put one in for about five minutes it floated. Once it settled in a few minutes it would start to bump, but we'd leave it in overnight. It would be nothing to get fifteen or twenty out of a gill net in the lagoons. In the Murrumbidgee in the drum nets there would often be three or four cod and fifteen yellowbelly in with them. There used to be an abundance of yellowbelly, most of them in the 4 to 5 pound range, the best I saw was 16 pound out of many thousands. A lot of the yellowbelly down that way have disappeared. The yellowbelly was the most common out there, but there was a lot of cod there too. We used to sell a lot of our fish over at Leeton and Griffith. We'd have boxes and bags of fish and we had a pretty good market. The cod were fairly common, we had no trouble catching them though we could go a week or a fortnight at times with two hundred hooks in the river and we wouldn't see a fish. In the hot weather we'd use jumper lines, we'd have a piece of line just touching the water, with a grub or yabbie, and the carp was the best, just half in the water. At night in the real hot weather the cod would feed on the surface and when they were feeding really well you'd get a cod off and you'd go to the next line and there would be another one on that line. They'd feed on the mice and they'd get them half way across the river. Another great bait was the grey tree frogs, they were a favourite.

Most of the cod would have been, the common size was from 8 to 10 pound, though we used to get a lot of bigger fish. If you pulled in a drum net you get some 8 to 10 pounders and a 60 pounder. The smaller ones were a good selling size. We caught a few in the 80s; we never come across a bigger one, though we had a few holes punched in the nets. We had when we lived on the river a couple of pets, one we could see from our kitchen window, and we wouldn't target him, he was better than a hundred pounds. There was two of them that big that we knew fairly well, the other was a bit further down near some rubbish in the river. The river used to be clear as crystal, you don't see that anymore. In the middle of the day you could see him moving, we used to like watching him. The cod, I've seen them with half grown ducks in them, full shell mussels, heaps of mice, centipedes, eggs. I've caught heaps of them on eggs. In the early part of the spring when the ducks were nesting they take their eggs if they got into the river. Plenty of yellowbelly in the cod's gut, pound to a pound and a half yellowbelly. There was often fish in them you couldn't identify, they'd be at the stage where the skin was coming off them. I think in the spawning season the cod do migrate a bit, we used to catch them in the drum nets in the breeding season. Dad would have a pretty good idea of where to put the nets. They don't charge up the current, they take the quiet side, we would set our drum nets in the bends.

The slipperies, there was plenty up this way in the Gilmore Creek, don't recall seeing them at Carathool. There was another fish down there at Carathool we'd catch in the wire drum nets, we used to get these tench. There used to be quite a few there, then they disappeared. There used to be redfin there, but not many. If you went fishing with worms you'd get one, but they were an exception. They were scarce everywhere then, the Murrumbidgee and in the lagoons, and very seldom would you find a redfin in a fish, they weren't common. There was a lot of Crucian carp, millions of them, then they disappeared. We used to get them in a bait net twenty yards long in the lagoons. In the summer the river would clear and you would see schools of two to three hundred of them, black, white and reds, quite a variety of them. Down there was also plenty of gudgeons in the river too, thousands upon thousands, in the lagoons and the river. If you were sitting where there was shelter you'd see heaps, but not in recent years.

As I sit here today I cannot even begin to imagine how we can sit back and let out beautiful river system be degraded to the state it is in today. Gone are all the lagoons together with all the bird life they used to support , ducks, cormorants, spoonbills, etc. Thousands upon thousands of river red gums dead or dying from the lack of a drink. The river bed itself is suffering from drifting sand which is causing loss of habitat for the fish, the fish cannot live in half a meter of water. I could take you down to Carathool and show you lagoon after lagoon that has not had water in them for thirty years. Lagoons which in my younger days used to support large numbers of yellowbelly and Catfish. Also in the lagoons there were large numbers of what we used to call lagoon mussels, they were a small version of the river mussel. Because they were thick in the body they made good bait for the fish, we collected them by the hundreds.

Down at Carathool it's a total disaster, the trees are dying from the lack of water, they haven't had water for so long. It's the dams and irrigation that's buggered it, the water's too cold and there is too much being taken out, for the rice and cotton. It's been going on for years and now the river's paying the price. We had a permit to kill fifty water rats at a time, there was that many of them down there they'd be killing a lot of our fish. We'd skin the bucks for good money. Now you'd hardly find a water rat. And the frogs, at night all you could hear were the frogs everywhere, now you would hardly ever hear one. In fifty years time it will look as though they dropped a bomb on it. I can show you kilometre after kilometre in the river where the sand is drifting down and there's been no floods to gouge it out. In recent years I have heard people in high places say there are more river red gums growing now than ever before. I would like to take them for a drive. It makes me so sad to see what's happening down there, it makes me cry. These days, as I drift back through the years and think about my fishing in the Murrumbidgee, I can only say it may not have been heaven, but it was next door.

20 Riverina Catchment

GREAT COD-FISHING.

In a letter to Mr. D. G. Stead (naturalist to the Fisheries Department) Mr. C. T. Wood, hon. secretary Narrandera A.F.C., reports as follows:—

I have just returned from a visit to Messrs. Hill and Archer, at Coonong Siding. I had the sport of my life. We located the fish on Sunday afternoon, and were kept busy from that out. The water is part of the Colombo Creek, and is teeming with Murray cod. We had two canvas boats, splendid little dingies, manufactured by these handy men. Mr. Jarman was the fourth, and, two of us in each boat, we trolled six or seven miles in 2½ hours, and caught 45 fish in that time, averaging not less than 10lb. The largest was 23½lb, the next 19½lb, and the smallest 3lb. We had previously in another part of the creek caught four, 11½lb, 14lb, 16lb, and 30lb approx. The Colombo Creek is dammed into sections, but we were more successful in this particular section, owing to the water in it being particularly clear. There are no trees on its banks, but the weeds extend from 3 to 15 yards into the stream, and there are also stumps of dead trees here and there on the bottom, forming further harbour. These are the stumps of trees which were growing in the channel before the water was dammed back. Then a temporary dam was erected, and the water killed the trees, which were chopped down (in this particular section only) when the creek again dried. Now, however, there is a very substantial dam, which makes this sheet of water permanent. It is wide and very deep, and altogether would make a splendid site for a hatchery. That the cod thrive there is shown by the large quantity which came at our spinners in such a short space of time. Every couple of hundred yards we went we accounted for one or two in each boat. We were, however, a long way from camp, and had to gather our fish from the tethers after we had something to eat, and make back for camp, some 20 miles distant by the creek. We caught about a dozen on cross lines, and when we arrived back at the camp, at about 6.30 a.m. on Monday, we had between 60 and 70 fish, weighing approximately 600lb.

Sydney Morning Herald, 5 April 1910

GREAT COD FISHING

In a letter to Mr. D. G. Stead (naturalist to the Fisheries Department) Mr. C. T. Wood, hon. Secretary Narrandera A.F.C., reports as follows:-

I have just returned from a visit to Messrs. Hill and Archer, at Coonong Siding. I had the sport of my life. We located the fish on Sunday afternoon, and we kept busy from that out. The water is part of the Colombo Creek, and is teeming with Murray cod. We had two canvas boats, splendid little dingies, manufactured by these handy men. Mr. Jarman was the fourth, and, two of us in each boat, we trolled six or seven miles in 2½ hours, and caught 45 fish in that time, averaging not less than 10lb. The largest was 23½lb, the next 19½, and the smallest 3lb. We had previously in another part of the creek caught four, 11½lb, 14lb, 16lb, and 30lb approx. The Colombo Creek is dammed into sections, but we were more successful in this particular section, owing to the water in it being particularly clear. There are no trees on its banks, but the weeds extend from 3 to 15 yards into the stream, and there are also stumps of dead trees here and there on the bottom, forming further harbour. These are the stumps of trees which were growing in the channel before the water was dammed back. Then a temporary dam was erected, and the water killed the trees, which were chopped down (in this particular section only) when the creek again dried. Now, however, there is a very substantial dam, which makes this sheet of water permanent. It is wide and very deep, and altogether would make a splendid site for a hatchery. That the cod thrive there is shown by the large quantity which came at our spinners in such a short space of time. Every couple of yards we went we accounted for one or two in each boat. We were, however, a long way from camp, and had to gather our fish from the tethers after we had something to eat, and make back for camp, some 20 miles distant by the creek. We caught about a dozen on cross lines, and when we arrived back at camp, at about 6.30 a.m. on Monday, we had between 60 and 70 fish, weighing approximately 600lb.

Sydney Morning Herald, 5th April, 1910

Figure 20.1 The Riverina Catchment showing major waterways and key localities.

20.1 Early European Accounts

The Riverina is a general term that identifies the area of land between the Murrumbidgee and Murray Rivers. Rather than being a discrete catchment, for the most part the waterways of the Riverina exist as a complex of anabranches. The largest river is the Edward River, which originates as an anabranch of the Murray near Mathoura. It roughly follows an earlier course of the Murray, the genesis of the Edward River being earth movements near Barmah displacing the Murray to the south. Along its journey its waters are added to by inflows from the Billabong Creek, which rises in the hills near Holbrook, receiving the flow of the Yanco Creek, which emerges from the Murrumbidgee River. Between the Edward and Murray Rivers are a series of anabranches, the two largest being the Wakool and Niemur Rivers. The Edward River enters the lower reaches of the Wakool River a short distance before it enters the Murray River near Tooleybuck.

The first Europeans to encounter the Edward River were John Webster and James McLaurin who in 1840, while droving cattle, named it after their employer Edward Howe. It is sometimes referred to as the Kyalite which is believed to be an aboriginal name for the river pronounced 'Kolety' (Mulham, 1994). The formation of the Moira Fishing Company in 1855 on the Murray River near Barmah resulted in the development of a commercial inland fishery. By 1861 the company was sourcing some of their catch from the Edward River near Deniliquin (*Deniliquin Pastoral Times,* 2 August 1861). The Edward River developed as a significant fishery in its own right, particularly after the railway to Deniliquin arrived in 1876, allowing rapid shipment of the catch to the important Melbourne Market.

Many accounts record an abundance of fish in the early years. In 1866 it was reported that 'Large quantities of these fish – cod, bream and perch – are now caught in the Edward and its tributaries, and are brought into Deniliquin for sale' (*Deniliquin Pastoral Times,* 8 September 1866). Local resident Austin Eastman in a newspaper article reminisced how in 1916 between Deniliquin and Moulamein:

> Large quantities of cod, trout, perch and bream were caught and sold on the Melbourne market. Curry and Rice came from Barmah in their boats, which were cut out of gum logs and driven by a small motor. They had a team of fishermen on shares, with 20 drum nets each. Bob Irvin and Sons of Deniliquin also fished with 60 nets, and I remember Irvins used to catch up to 8 cwt-baskets of fish every week. / As school boys we used to go for a days fishing with boys from "Moonah Cullah", who taught us how to dive for lobster, and mussels to use for bait. Spinning home behind the boat we often caught so many cod that we were able to pick and choose, throwing back any that were not the size we wanted (*Deniliquin Pastoral Times*, 23 September 1969).

As late as 1954 a party of anglers took from the Wakool River in four days 35 Murray cod up to 27 lb. (12.3 kg) in weight the total catch amounting to 230 lb. (104.6 kg) (*Argus,* 9 January 1954).

The extent of the commercial inland fishery resulted in the appointment of Osbourne Wilshire in 1882 as 'Assistant Inspector of Fisheries, Murray and adjacent waters', based at Deniliquin. He was in fact a part time fisheries inspector, as he also worked for the government as a forestry inspector. Ultimately Wilshire's salaried position was terminated as a result of the financial depression of the 1890s but he continued to act in an honorary capacity for some years afterwards. During his tenure Wilshire acted as a local naturalist, investigating occurrences such as fish kills. He provided some valuable early records of the local fishery which was largely overlooked in subsequent years, due to the importance of the fishery at Barmah. These include written accounts to the department and museum specimens (*Australian Museum* database; *Sydney Morning Herald,* 20 November 1888).

Local residents lobbied for restrictions to be placed on commercial fishing activity in the Edward River to conserve fish stocks close to Deniliquin. This ultimately led to the Representative of Inland Fisheries, Henry Dawson, conducting an inquiry at Deniliquin in July 1909 to assess the situation. Later that year David Stead visited the area and was involved in trials tagging native fish to investigate their movements (NSW Fisheries Report, 1909). Forty years latter John Langtry conducted his survey of the inland fishery but, apart from a few salient points, did not discuss the Edward or the other streams of the Riverina (Cadwallader, 1977).

20.2 The Past Distribution of Fishes in the Riverina Catchment

The Riverina was not identified as a distinct catchment in the *Sustainable Rivers Audit* (Davies *et al.,* 2008). The area adjacent to the Murrumbidgee River, including the upper Yanco Creek, was included in that catchment with the rest of the Riverina encompassed by the Central Murray River catchment. It has been treated separately here largely due to requests to the author by local anglers and historians that a history of fish in the region be provided. Most of the information that follows covers an area that would be included in the Central Murray River catchment.

In the *Sustainable Rivers Audit* the Central Murray River catchment was treated as being entirely as lowland habitat but was divided into three geographical zones, two of which encompassed the region considered here being an upper zone (roughly east of Yarrawonga), and a middle zone (west of the Yarrawonga to the Murrumbidgee junction). The upper reaches of the Billabong Creek upstream of Walbundrie begins to assume the physical form of slopes type habitat and, near Culcairn, exceeds an altitude of 200 m placing it clearly in the slopes zone as defined by the audit. This area appears to have been included in the 'upper zone' of the Central Murray Catchment in the audit. During the collection of historical information it became apparent that there were differences in the relative abundance of the various fish species in the upper reaches of this catchment compared to downstream. In the following discussion the Riverina is treated as encompassing three zones namely a slopes zone including the Billabong Creek upstream of Walbundrie, an east lowland zone to the east of Deniliquin and Conargo and a west lowland zone to the west of those locations.

The information presented below was sourced from some detailed newspaper accounts, information recorded in the Annual Reports of NSW State Fisheries, museum records and works by early naturalists. Most of the research concentrated in the area in the eastern half of the Riverina, principally between Mathoura and Moulamein. Oral history was not specifically collected for this catchment. During the collection of oral history for other catchments, principally the Central Murray (OH 61-77), information relating to the Riverina was obtained and has been utilised. Claude Handorf provided some useful history on the upper reaches of the Billabong Creek (Handorf, OH 61). Valuable information obtained during the early 1980s from the late Wallace 'Laddie' Clifford, a commercial fishermen based at Barmah, has also been included. A small number of old photographs of catches of native fish in this catchment have been located. Further historical research in this catchment would be of value particularly in the lower reaches west of Moulamein.

20.2.1 The Slopes Zone

Oral history provided by a single individual (Handorf, OH 61) is the only source located to date describing fish populations upstream of Walbundrie in the Billabong Creek. Claude Handorf of Burrumbuttock has recalled stories from his father and uncle of cod being very common in the upper reaches of the Billabong Creek between Walbundrie and Walla up to the early 1920s. He also recalled stories of 'white eyes' also having previously been very common in the same area (Handorf, OH 61). The 'white eyes' were Macquarie perch which were captured by Claude's father in his presence in the Murray River near Howlong and with which

Claude was familiar with in later years in Lake Dartmouth (Claude Handorf, pers. com.). During the 1930s Blackfish were abundant in the Billabong Creek upstream of Walbundrie (Handorf, OH 61). This single account indicates that originally cod were common, Macquarie perch very common and Blackfish abundant in slopes habitat in the Billabong Creek.

20.2.2 The Lowland Zone, East & West

Newspaper accounts indicate that cod were abundant in the Edward River and supported a significant commercial fishery (*Deniliquin Pastoral Times*, 8 September 1866, *Deniliquin Pastoral Times*, 23 September 1969; NSW Fisheries Report, 1909). In the Edward River at Murgah Station, about 20 km east of Moulamein, Laddie Clifford in one week took 1260 lb. (572.7 kg) of Murray cod up to 85 lb. (38.6 kg) in weight and the following week took another catch amounting to 1426 lb. (648.2 kg) (Photo RR20; Ramon Clifford, pers. com.). Cod were also abundant in the larger creeks including the Billabong and Yanco Creeks (*Argus,* 18 December 1937; Trueman & Luker, 1992; Laddie Clifford, pers. com.; Photos RR11, 17, 18 & 22) and in the Wakool River (*Argus,* 9 January 1954). Even small streams such as the Colligen Creek were also considered to be a reliable source of cod (*Deniliquin Pastoral Times*, 23 September 1969). In the Colombo Creek near Coornong, Murray cod were abundant, David Stead along with three commercial fishermen during fishing operations:

> trolled six or seven miles in 2½ hours, and caught 45 fish in that time, averaging not less than 10lb. The largest was 23½lb, the next 19½, and the smallest 3lb. We had previously in another part of the creek caught four, 11½lb, 14lb, 16lb, and 30lb' with a total catch over a weekend totalling 'between 60 and 70 fish, weighing approximately 600lb' (*Sydney Morning Herald*, 5 April 1910).

The earliest reference to Trout cod in the Riverina is the mention of 'trout' in a news item in 1865 (*Deniliquin Pastoral Times,* 11 March 1865) and David Stead in 1909 identified the fish called 'trout' in the Edward River as Trout cod (*Sydney Mail,* 27 November 1929; NSW Fisheries Report, 1910-13). Quite a number of museum records exist of specimens of *Maccullochella macquariensis* being collected from Deniliquin by Osbourne Wilshire during 1887/88 but most do not appear to have survived and their true identity is unknown (*Australian Museum* database). Two specimens collected from Deniliquin are now held by the *National Museum of Natural History* in the United States. A recent examination has revealed that the jaws are equal in one fish and in the second specimen the lower jaw is definitely longer, indicating that both are Murray cod (Shirleen Smith, NMNH, personal communication). A photograph of a catch of cod from the Edward River probably includes a Trout cod (Photo RR4).

Early accounts of 'trout' near Deniliquin suggest that Trout cod were common. Downstream between Deniliquin and Moulamein in the Moonah Cullah area, the report of 'Large quantities of cod, trout, perch and bream' being taken (*Deniliquin Pastoral Times*, 23 September 1969) also implies that they were common. Henry Dawson in 1909 reported that the locals described the 'trout' as being 'reasonably plentiful' compared to the other species discussed which in contrast were described as 'plentiful' suggesting a lower abundance. During tagging trials conducted at Dahwilly in 1909 no Trout cod were recorded. It appears the only specimen ever examined by Stead from the Edward River was the single example collected by him in August 1909 (NSW Fisheries Report, 1910-13). Stead did not record their presence in the Columbo and Yanco Creeks in subsequent surveys.

Laddie Clifford captured only small numbers of Trout cod from the Edward River and all were taken adjacent to the Murray River near Mathoura. He recounted the stories from older fisherman which he named and quoted who stated that 'fair numbers' were caught up to the Great Depression in stretches of faster water between

Mathoura and Barratta Station, with only the odd fish turning up at Niemur or Moulamein. Clifford also recalled that a few 'bluenose' had been caught out of the Billabong and Yanco Creeks by professional fisherman prior to the Second World War, but not by him during his lifetime (Laddie Clifford, pers. com.). His account of the presence of Trout cod in the Billabong Creek is corroborated by another angler recalling the presence of small at numbers at Hartwood Station on the Billabong Creek, and further upstream in the Yanco Creek in the 1930s (McKenzie, OH 52). Overall, on the available evidence, Trout cod were very common in the upper Edward River but declined in abundance downstream of the Barratta area. Elsewhere in the lowland zone they were widespread but not common.

Ogilby (1893) examined specimens of Macquarie perch from the 'Yulpa Creek, near Deniliquin', today known as the Gulpa Creek. He also identified it as the source of some of Castelnau's specimens in the 1870s, suggesting that they were common in that water. Further downstream Cadwallader (1981) using old Victorian Fisheries and Game Department manuscripts reported that 60 Macquarie perch and cod had been translocated from the Kyalite (Edward) River to the Wimmera River in 1948. An earlier possible record provided by Cadwallader dating from 1933 of '50 cod and perch' sourced from the Wakool River including Macquarie Perch appears unlikely, as other records indicate that the fish were Golden perch (NSW Fisheries Report, 1934). Macquarie perch were captured in the Edward River during the tagging trials at Dahwilly in 1909 but were less common than Golden perch (NSW Fisheries Report, 1909). A fish kill in the Yanco Creek in 1915 near Yathong was reported to include 'three species of perch' implying Golden, Silver and Macquarie perch (NSW Fisheries Report, 1915, 1929, 1934).

Laddie Clifford recalled that they were common in the Edward River near Mathoura and taken in small numbers near Moulamein but suggested that the general opinion of professional fisherman was they had never been as common as Golden or Silver perch in the Edward River (Laddie Clifford, pers. com.). Macquarie perch were regularly taken in the Billabong Creek at Hartwood Station, between Jerilderie and Conargo, during the 1930s (McKenzie, OH 52). Overall Macquarie perch appear to have been very common in the eastern lowland zone but declined in abundance downstream.

Golden perch up to 18 lb. (8.2 kg) were taken from the Coonong Creek (*Argus*, 11 August 1922), were 'very numerous' in the Edward River (NSW Fisheries Report, 1909) and present in 'countless numbers' in the Yanco Creek (NSW Fisheries Report, 1915). Oral history recalls Golden perch to have been abundant in the Wakool River (Ashton, OH 146; Russell Stillman, pers. comm.), the Billabong Creek (Clifford, OH 72) and very common in the Gulpa Creek (Nicholson, OH 67). Silver perch were reported to have been one of the principle fishes taken near Deniliquin in the early years (NSW Fisheries Report, 1887) with fish up to 17 lb. (7.7 kg) being taken from the Coonong Creek (*Argus*, 11 August 1922). They were common in the Gulpa Creek (Nicholson, OH 67) and abundant in the Billabong Creek (Clifford, OH 72). Golden perch and Silver perch appear to have been widespread and abundant throughout the lowland zone.

Catfish were described as being 'very numerous' in the Edward River (NSW Fisheries report, 1909), were abundant at Weman (Clifford, OH 72) and 'plentiful' near Moonah Cullah, with observations recorded of extensive nest construction in the Edward River (*Deniliquin Pastoral Times,* 23 September 1969). Catfish were particularly abundant in smaller creeks including the Boree Creek (NSW Fisheries Report, 1910-13) and the Columbo creek, near Urana (Handorf, OH 61), where catches of up to 70 fish a night were reported (Briggs, OH 70). They were very common in the Billabong Creek, near Murgah (Photos: RR17-18; Clifford, OH 72), and at Hartwood station (Author's pers. obs.) and were present in the Gulpa Creek (Nicholson, OH 67).

Ogilby (1913) reported Blackfish to have been present in the Yanco Creek and quite a number of museum specimens were collected from the Deniliquin area (*Deniliquin Pastoral Times*, 31 January 1886; *Australian*

Museum Database). David Stead captured Blackfish from the Edward River probably near Dahwilly (*Sydney Morning Herald,* 9 November 1909; NSW Fisheries Report, 1909). Oral history recalls that they were plentiful in the Wakool River in the Gonn area around World War Two (Ashton, OH 146) and in the Edward River near Mathoura (Laddie Clifford, pers. com.). From this limited evidence it appears that Blackfish were widespread, and at least locally common. Lampreys, probably Short-headed lampreys (Lintermans, 2007), also were present in the Edward River (*Sydney Morning Herald*, 9 November 1909). An unusual resident was a seal which was shot near Conargo and spent many years mounted in the Conargo Hotel (*Argus,* 9 February 1946, 14 December 1951).

20.2.3 Estimates of Native Fish Abundance in the Riverina Catchment at European Settlement.

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) did not treat the Riverina as a separate catchment and rarity scores were not provided. Presented are scores developed in the *True Tales* Project using historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 20.1 Riverina Catchment Rarity Scores (Main River Channels)

	West Lowland (West of the Cobb Highway)		**East Lowland** (East of the Cobb Highway)		**Slopes** (Upstream of Walbundrie)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod		L3		**U3**		3?
Murray cod		**5**		**5**		3?
Golden perch		**5**		**5**		?
Silver perch		**5**		**5**		?
Macquarie perch		L3		**U3**		L5
Catfish		5		**5**		?
'Blackfish'		3		3		**5**

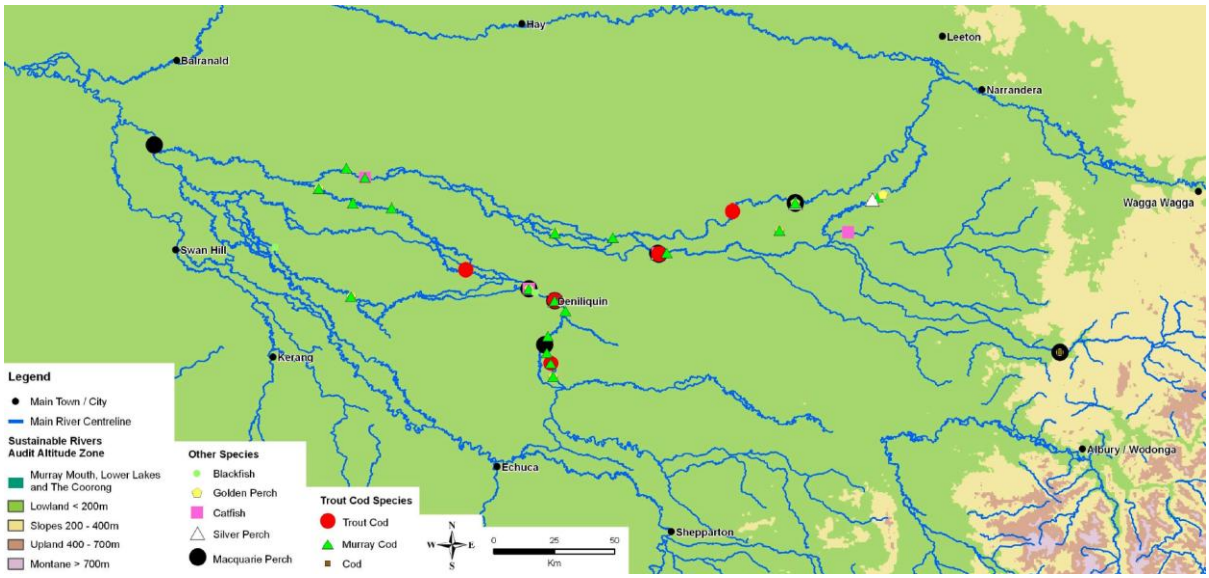
Key

0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type supported by multiple accounts or lines of evidence e.g. Oral history, newspaper accounts, photographs.

Figure 20.2 Historical Records for Native Fish in the Riverina Catchment



Photograph 20.1 Mathoura Cod Catch

Photo RR 15. This photo is of a catch of cod from the Edward River at Mathoura c1930 taken by Jack Domenico and party. It clearly illustrates the abundance of cod in the Edward River. Photo courtesy of Frank Passalaqua.

Photograph 20.2 Mathoura Trout Cod

Photo RR4. Left: A party of anglers with a catch of cod from the Edward River near Mathoura c1930. Present is Alfred Blythman with his pipe along with Frank Butcher, Lee Jones, Bill Simmie, Frank Parsons, Sammy Southern and a Mr Knight.

Right: One of the cod hanging on the truck has a very long, strongly pointed snout and there is evidence of an eye stripe and speckled markings in this enhanced image. The fish is probably a Trout cod. Photo courtesy of Max Huddle and Bill Mulham.

Photograph 20.3 Billabong Creek Catfish

Photo RR18. Wallace 'Laddie' Clifford on right with a catch of Catfish from the Billabong Creek at Murgah Station c1965. Also in the catch is a Murray cod held by the gentleman in the centre. The Billabong Creek remained a stronghold for the Catfish until after the arrival of European carp in the 1970s. Photo courtesy of Ramon Clifford.

Photograph 20.4 Laddie's Catch

Photo RR20. Wallace 'Laddie' Clifford (centre) with a catch of Murray cod in Echuca. The cod were caught from the Edward River 20 km east of Moulamien at Murgah Station in 1979. The largest fish weighed 85 lb. (38.6 kg) and the total weight of the catch was 1260 lb. (572.7 kg). The following week Clifford took another catch of cod from the same area amounting to 1426 lb. (648.2 kg). Much of the catch was sold to Drak's fish shop, operated by George Dracatos (Right) and his son John (left). Clifford had first-hand knowledge of the Barmah region fishery back to the Great Depression and could recall the stories of older fishermen back to the dawn of the twentieth century. He provided important information on the early distribution of Trout cod and Macquarie perch in the streams of the Riverina and in the Murray River. His familiarity with the Trout cod was demonstrated by his donation to a commercial fish hatchery of a 6 kg specimen he captured in the Murray River between Barmah and Echuca in 1982. Photo courtesy of Ramon Clifford.

20.3 The Changes

20.3.1 Changes to Native Fish Distribution and Abundance

In the slopes zone upstream of Walbundrie cod and Macquarie perch had disappeared by the 1930s though Blackfish remained abundant. By the 1950s a decline was evident in Blackfish numbers, the species subsequently becoming scarce (Handorf, OH 61; Claude Handorf, pers. com.). In the lowland zone in the Edward River near Deniliquin small Murray cod were common up to the late 1940s, after that time fewer larger fish were taken, with cod becoming scarce by the 1960s (*Deniliquin Pastoral Times*, 23 September 1969; Frank Moore, pers. com.). Further downstream at Murgah large Murray cod were common into the 1970s though small cod were uncommon (Laddie Clifford, pers. com.). The last historical account of Trout cod in numbers in the Edward River dates from the end of the First World War (*Deniliquin Pastoral Times*, 23 September 1969) with a photograph possibly recording a capture around the late 1920s (RR4). Senior local anglers in the Deniliquin area, who fished the river back to the 1930s, in conversations with the author could not recall having seen the species in the Edward River and they were absent from the Gulpa Creek in the 1940s (Nicholson, OH 67). Small numbers of Trout cod were captured near Mathoura up to the early 1950s (Laddie Clifford, pers. com.; Clifford, OH 72) being the last report of the species in the Edward River. From the written and oral accounts it appears that Trout cod underwent a dramatic decline in the upper Edward River between 1918 and 1930 while Murray cod remained relatively abundant.

Macquarie perch were absent in the Gulpa Creek by the 1940s (Nicholson, OH 67) and were not captured by professional fishermen in the Edward River near Murgah or the Billabong Creek after the 1950s (Laddie Clifford, pers. com.). The last documented capture appears to be the fish translocated from the Edward River in 1948 though the precise location they were sourced is unclear (Cadwallader, 1981). Occasional captures took place near Mathoura into the 1950s (Laddie Clifford, pers. com.), with their persistence in that area probably being associated with the significant population residing in the adjacent Murray River at Barmah around that time (Cadwallader, 1977). Golden perch and Silver perch were common in the Edward River until the 1960s after which a decline was evident particularly of Silver perch (Max Clifford & Russell Stillman, pers. com.). Both species remained very common in the Billabong Creek up till the 1980s but by the end of that decade Silver perch had become scarce (Author's pers. obs.).

Catfish very rapidly declined in the Edward River during the early 1930s (*Deniliquin Pastoral Times*, 23 September 1969) and after that time were unusual captures (Clifford, OH 72). They were scarce in the Gulpa Creek by the 1940s (Nicholson, OH 67) but remained very common in the Billabong Creek until the 1980s after which they were captured less frequently and in smaller numbers (Author's pers. obs.). Blackfish were plentiful in the Wakool River in the Gonn area around World War Two after which they disappeared (Ashton, OH 146). Anglers have indicated a virtual absence of Blackfish in the Edward River after the Second World War (Russell Stillman & Frank Moore, pers. com.).

20.3.2 Changes to Habitat

By 1945 land clearing and grazing had resulted in much of the Riverina being affected by wind and water erosion. In some areas it was reported that the farmers were farming the 'subsoil' as virtually all of the 'topsoil' had been lost (*Argus,* 11 August 1945). Moulamein developed as a minor river port with the Edward River downstream being extensively desnagged during the early 1870s to permit navigation of the river boat traffic. The operations included removal of bankside trees as well as snags from the river (*Deniliquin Pastoral Times,* 8 May 1869, 27 January 1872). Between 1870 and 1890 extensive desnagging of the upper reaches of the Edward River took place. A detailed survey of river depth and snags in the Edward River undertaken by the

NSW Public Works department in December 1890 reported a relatively low snag frequency for the upper Edward River and concluded that very little effort would be required to finish desnagging the river (*Deniliquin Pastoral Times,* 26 March 1891). Many of the remaining snags near Gulpa were removed during 1895 and in the same year Murgha Station arranged for the desnagging of the river between that location and Woorooma (*Deniliquin Pastoral Times,* 17 August 1895). Lobbying by the local rowing club resulted in some snag removal taking place at Deniliquin in 1902 and further desnagging took place in conjunction with irrigation and water diversion projects after World War Two (Bill Mullham, pers. com.). It is apparent that the Edward River along virtually its entire length had been heavily desnagged well before 1890, with the greatest activity having taken place from Moulamein downstream.

Fish kills were recorded in the Riverina from an early date. In 1865 huge fish kills occurred across the Murray-Darling Basin which included the Edward River (*Deniliquin Pastoral Times,* 5 August 1865, 9 September 1865). In 1878 a rain event generated a massive fish kill in the Edward River involving fish of all sizes which included cod and 'perch' as well as crustaceans (*Deniliquin Pastoral Times,* 16 February 1878). In 1891 large quantities of fish died in lagoons near Deniliquin the kill being attributed to excessive aquatic vegetation (NSW Fisheries Report, 1891). During the drought of 1915 large numbers of fish died in the Billabong Creek near Jerilderie (NSW Fisheries Report, 1915) and in the same year a massive fish kill occurred in the Yanco Creek near Yathong, associated with flow event after a drought (NSW Fisheries Reports, 1915, 1929, 1934). During the summer of 1938-39 large numbers of fish, including cod, died in the Billabong Creek near Jerilderie. The kill was so extensive that council employees removed the dead fish and burnt them to protect the water supply, on one occasion three tonnes being dealt with (*Argus*, 24 December 1938, 29 December 1938, 11 January 1939).

Newspapers reported that intense fishing pressure was placed on fish populations in the Edward River from an early date and linked a suggested decline in the fishery to both legal and illegal activity. As early as 1861 it was recorded that one professional fisherman was taking up to 150 lb. (68.2 kg) of fish from the Edward River each day (*Deniliquin Pastoral Times,* 2 August 1861). A few years later one party was taking two tonnes per week, with catches of up to half a tonne out of a single net (*Deniliquin Pastoral Times,* 8 September 1866). In the Edward and Wakool Rivers it was reported that nets were set so as to block all upstream movement of fish (*Sydney Morning Herald,* 11 November 1950). Illegal fishing was extensive and at times explosives were used (NSW Fisheries Report, 1909; Ashton, OH 146).

Pastoralists constructed many weirs on the smaller watercourses for stock and domestic use. With the construction of the Yanco Weir on the Murrumbidgee River, large scale regulation and diversion of the waters of the Riverina commenced in 1928. The Stevens Weir was constructed in 1932 on the Edward River about 27 km downstream of Deniliquin and backed water upstream to the town, converting that reach of the river from a riverine habitat to a comparatively static lake. The operation of Stevens Weir reduced flows downstream in the Edward River during periods of water diversion into the Wakool Irrigation Scheme. At other times releases caused rapid rises in water levels. The rapid and dramatic changes in water levels had a negative impact on the aquatic fauna with crayfish disappearing from the river downstream (*Deniliquin Pastoral Times,* 23 September 1969). Later, weir regulators were constructed on the Gulpa Creek and Edward River near its origin at the Murray which altered flows in the section of river upstream of Deniliquin (Bill Mullham, pers. com.). Water was also diverted from smaller streams such as the Colligen Creek with impacts on fish populations (*Deniliquin Pastoral Times,* 23 September 1969).

Goldfish and Redfin perch were introduced near Deniliquin in 1884 (*Deniliquin Pastoral Times,* 31 May 1884). Redfin perch appear to have remained fairly scarce for a considerable period, being recorded in surveys in the Edward River in 1909 as only being present in 'small quantities' (NSW Fisheries Report, 1909). Around 1930

they proliferated in the Edward River and their arrival in large numbers was associated with a rapid decline in the Catfish population, and a slower decline in the Murray cod fishery, with predation of juvenile cod being reported (*Deniliquin Pastoral Times,* 23 September 1969). In the Billabong Creek between Jerilderie and Conargo Redfin perch were much less abundant than in the upper Edward River (Laddie Clifford, pers. com.) though much more common further upstream from Jerilderie (Claude Handorf, pers. com.). The disappearance of the once abundant 'white eyes' in the slopes habitat of the upper Billabong Creek was suggested to the author twenty years ago by senior local residents as coinciding with the arrival of Redfin perch in large numbers during the 1930s. By the 1940s Tench were very common in the Edward River (Clifford, OH 72; Frank Moore, pers. com.).

European carp arrived in the Riverina during the 1970s, and are reported to have impacted on the aquatic vegetation in the Colombo Creek with their feeding causing the fringing rushes to topple over (Don Briggs, OH 70). European carp have been implicated in the decline of both Catfish and Silver perch generally (Clunie & Koehn, 2001a, 2001b), though the decline of Catfish in the Edward River predates the arrival of carp. The Billabong Creek between Jerilderie and Conargo contained significant numbers of Catfish until the early 1980s after which they became less common suggesting that carp may have played a role (Author's pers. obs.). Subsequent to the arrival of European carp the Redfin perch population dramatically declined in the Edward River (Russell Stillman & Frank Moore, pers. com.).

Photograph 20.5 Deniliquin Redfin Plague

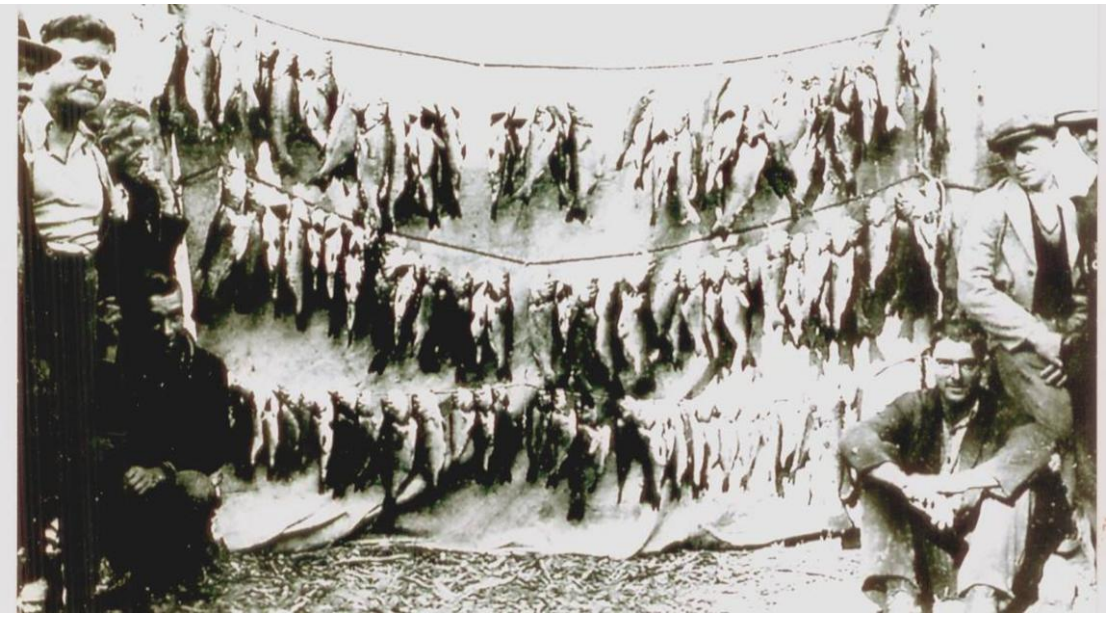


Photo RR 14. This photograph of a catch of fish nearly all of which are Redfin perch taken near Deniliquin in the 1930s supports the newspaper account of Austin Eastman that the species underwent explosive proliferation in local waters around that time. Eastman speculated that Redfin perch caused the rapid decline of Catfish and Murray cod over the subsequent two decades. Photo courtesy of Bill Mulham.

20.4 The Current Situation

The waters of the Riverina contain good stocks of Murray cod and Golden perch, with evidence of a significant recovery in numbers of these two species over the past twenty years. Silver perch have recovered, becoming common in the Wakool River and, to a lesser extent, the Edward River; though remain scarce in the Billabong Creek. Catfish are very rare in the Edward River, though small numbers continue to be taken in the Billabong and Columbo Creeks. Blackfish are scarce and Macquarie perch have not been reported for half a century. Small numbers of Trout cod have been recently captured in the Edward River near Mathoura, probably having dispersed from the significant population that now exists in the Murray River near Barmah. The recent drought has adversely affected fish populations in the smaller streams with major fish kills in the Niemur River and the Colligen and Merran Creeks (*Daily Telegraph*, 20 February 2009).

20.5 Newspaper Highlights

Deniliquin Pastoral Times, 2 August 1861
FISHING IN THE EDWARD – The fish in the river at Deniliquin are now promised a little rest, Mr. May / having left. Mr. May managed to bag some tons during his stay of three months, sometimes taking 150lbs. weight per diem.

Deniliquin Pastoral Times, 11 March 1865
PISCATORIAL – The disciples of old Isaac must be possessed of much patience to meet with reward. The river is too low for anything but small fish to be caught, still there have been some very nice perch and trout taken during the week.

Deniliquin Pastoral Times, 5 August 1865
MORTALITY AMONGST THE FISH – It is rather an extraordinary thing that the fish in the Darling and Murray are dying in thousands. The blacks never saw such a thing before, and are quite alarmed about it; some say that the heavy frosts kill them, but I can hardly attribute it to the cold, as the largest codfish dies as well as the smallest fish; it is surprising to see tons of fish daily floating down the river (from a correspondent, Lower Darling).

Deniliquin Pastoral Times, 9 September 1865
MORTALITY AMONGST FISH – The unusual mortality previously noticed as occurring in the Murray and Edward, is not confined to those southerly streams, but extends to the Darling and its tributaries. On the Macquarie, we hear the deaths amongst the finny tribe have been so enormous as to show a probability of the entire stock being extinguished. On the Murrumbidgee similar complaints are heard. There has, as yet, been no cause assigned for this singular epidemic.

Deniliquin Pastoral Times, 8 September 1866
THE MURRAY FISH – Large quantities of these fish – cod, bream and perch – are now caught in the Edward and its tributaries, and are brought into Deniliquin for sale. The party is stationed about four miles above Deniliquin, and is composed of three single men / They fish with line and net. They were very successful some short time since, by line, and caught about two tons weight in a fortnight, and they bag by net, in a haul, from half-a-ton to a ton weight / They bring their fish into town, alive chiefly, and as mutton and beef are both very dear – from 6d to 9d per pound – the poor man here can get fish at times for 3d, or less, per pound.

Deniliquin Pastoral Times, 12 December 1874
Cod, perch and bream are plentiful in the Edward River (a large branch of the Murray), and fishing parties in the evening are quite common, in which ladies and gentlemen join. The fish in the Edward are, as a rule, not so large, and consequently not so coarse, as those of the Murray.

Deniliquin Pastoral Times, 16 February 1878
NOTES BY A SCAMP: / Whatever may be the cause, it is a noticeable fact that since the late rains something has gone wrong with the whole of the finny tribe in the river. During the wet days the crabs and crawfish took refuge on the banks of the river. The other fish, from the largest cod to the smallest perch, died in thousands, and now present a ghastly sight along the banks of the river, or floating on the surface of the water, while those still living are in a very delicate state of health

Deniliquin Pastoral Times, 31 May 1884
ACCLIMATISED CARP- Ever since it became evident that the surplus water from the waterworks could be utilized in the lagoons in the town reserves, the Municipal Council has been endeavouring to obtain a supply of English fish with which to stock them, and at last they have secured a small consignment of about thirty carp / Mr Waring has had some of them placed in the lagoon within the Cressy-street reserve / A further consignment of English perch is expected shortly / The crayfish common in our lagoons will be excellent prey, and in the course of a few years we may expect to see an excellent assortment of the acclimatized fish in our lagoon reserves.

Deniliquin Pastoral Times, 23 January 1886
FISH.- We have been shown fourteen or fifteen bottles containing small fish preserved in spirits of wine, and intended for the Indian and Colonial Exhibition to be held in London this year / The task of preserving them was entrusted to Mr O. Wilshire, the local inspector of Fisheries / The collection includes cod, bream, silver perch, cat fish, black fish and golden perch

Sydney Morning Herald, 9 November 1909
Great Cod Fishing. / The Edwards is a great ana-branch of the Murray, and is regarded as a fine cod stream, but the two investigators found it better than they had anticipated. They were accompanied by a young Australian, who fishes professionally, and brings to bear upon his work faculties of observation and resourcefulness. Not only were Murray cod caught – some being released with a metal tag upon them – but the black fish, fresh water catfish, crayfish, perch, lampreys, and yellow-belly were secured on lines and in nets. The largest cod weighed 64¼lb, and contained other partly digested fish.

Sydney Morning Herald, 5 April 1910
Great Cod-Fishing. / I have just returned from a visit to Messrs. Hill and Archer, at Coonong Siding. I had the sport of my life. We located the fish on Sunday afternoon, and we kept busy from that out. The water is part of the Colombo Creek, and is teeming with Murray cod. We had two canvas boats, splendid little dingies, manufactured by these handy men. Mr. Jarman was the fourth, and, two of us in each boat, we trolled six or seven miles in 2½ hours, and caught 45 fish in that time, averaging not less than 10lb. The largest was 23½lb, the next 19½, and the smallest 3lb. We had previously in another part of the creek caught four, 11½lb, 14lb, 16lb, and 30lb approx. / We caught about a dozen on cross lines, and when we arrived back at camp, at about 6.30 a.m. on Monday, we had between 60 and 70 fish, weighing approximately 600lb.

Argus, 11 August 1922
A Giant Grunter. Seeing recent notes on these fish, Mr. Jarman, of Narrandera, agrees with Mr. French as to the fighting qualities of the silver perch, or grunter, which is generally called black bream. As a table fish it is much improved by allowing it to simmer slowly in water until about half cooked, and then fry it. In exceptional cases it grows to a heavy weight. He on one occasion saw two golden perch, and a grunter taken in a gill net in Coonong Creek, near Jerilderie. The golden perch were 18lb. and 17½lb. respectively, and the grunter 17lb. – an amazing weight for that fish because he had never seen or heard of another that came within pounds of it. It was unusual in every way, because the grunter, like the trout-cod, keeps to the river bed, while the others get miles away from it in flood time.

Deniliquin Pastoral Times, 23 September 1969
Will the Murray Cod become a memory? (By Austin Eastman, "Bingel", Deniliquin)
Sir, - Permit me to express an opinion on the disappearance of the Murray Cod from the inland streams and what I consider should be done to try to restore their numbers. In doing so, permit me to go back at least 50 odd years in order to state a few facts and in so doing, I hope to prove my point of view.

During the floods of 1916-17-18, the Edward River was a popular stream for net fishermen, especially between Deniliquin and Moulamein. Large quantities of cod, trout, perch and bream were caught and sold on the Melbourne market. Curry and Rice came from Barmah in their boats, which were cut out of gum logs and driven by a small motor. They had a team of fishermen on shares, with 20 drum nets each. Bob Irvin and Sons of Deniliquin also fished with 60 nets, and I remember Irvins used to catch up to 8 cwt-baskets of fish every week. During the summer months cross lines, gill nets and spinners were used by fishermen, and they also caught plenty of fish. As school boys we used to go for a days fishing with boys from "Moonah Cullah", who taught us how to dive for lobster, and mussels to use for bait. Spinning home behind the boat we often caught so many cod that we were able to pick and choose, throwing back any that were not the size we wanted.

In recent years, when September was added to October and November for the spawning closed season, many fishermen gave drum netting away, because September was by far their most profitable month. I think it was about 1930 when we first began to catch English perch, better known as redfin, and they soon took control of inland streams. The first to suffer were the slower-moving catfish which had been very plentiful; there were times when the other fish were not biting and it was then that we caught catfish by the dozen. No longer do we see the basin-like shallow holes in sand beaches about three feet wide where they had their spawn in flood time and swam around the small fish to protect them from intruders. Obviously redfin had no respect for such protection.

When the Stevens Weir first came into operation (c 1935) the down stream side was naturally at a low level during the irrigation season. However, at weekends when Wakool irrigators had least use for water, more would be released at Stevens Weir, causing the river to rise up to 2 feet or more and fall again quickly, early in the following week. The lobsters took exception to this sudden variation and disappeared. I understand they travelled down stream. The last time small cod were plentiful was about 46-'47, when they were easy to catch on a spinner behind a boat. Since then they have become increasingly scarce and it seems that only a few big, old fish are left. Before 1950 it would be safe to say 70 per cent of the cod caught would be young fish less than 10 lbs; now they are almost non-existent.

Eight floods in ten years in the ‘50s should have been the best decade for spawning conditions for fish in the last 70 years. With the added protection of the banning of cross lines and nets of all kinds in the middle ‘50s, by now the Edward River and its tributaries should be teeming with fish of all kinds, with cod up to 20 lbs in weight. I’m sure that all anglers will agree that except for small redfins, river fishing has never been worse. Last year, the only licensed fisherman left in the district was forced to seek another occupation, in spite of high prices for fish, simply because he could not catch enough to live on. During the last drought two neighbours on the Colligen tried to irrigate portion of their properties from the creek, which had been getting a raw deal from available water supplies and had not flowed for many months. In doing so, the water supply soon ran out of the hole, which could only support three redfin. A few years previously, the same hole had been a reliable fishing place for cod.

Following the '55 and '56 floods, the river was teeming with small fish in early '57. At that time I was crossing the river by boat four times a day for several months, so was able to get a close-up view of shoals of tiny fish being constantly chased and devoured by bigger fish. If they were close enough to the bank when an attack occurred, some of them jumped out of the water on to the bank and stayed there for a few seconds until the attackers swam away. On one occasion an attack took place beside the boat in mid-stream so I was able to get a close-up view. About 10 redfin, 4 to 5 inches long, rushed into a shoal of small fish at terrific speed, many of which jumped out of the water in trying to escape; one landed in the boat; it was a cod about two inches long. Anglers will recall how plentiful and hungry small redfins were in '57; countless thousands were caught in all

streams. However; a year or two later, it was almost impossible to catch any worth taking home. I haven't the slightest doubt that the general shortage of fish is brought about by attacks on small fish by redfin; their greater speed cannot be matched by any other freshwater fish. /

20.6 Annual Reports on the Fisheries of NSW

1887

Deniliquin, February, 1887 / The principal species of fish in these waters are Murray cod, trout, gold and silver perch, silver and black bream; and a fair amount of these fish have been caught with gill nets and lines during the past year.

1891

A rather singular circumstance was noticed in some of the lagoons and creeks of the district this year, notably the one situated right in the town of Deniliquin hundreds of dead fish were seen on the surface of the water just after the commencement of summer, and much speculation as to the cause of the fatalities resulted. By some it was thought that the deaths were due to the largely increased temperature of the water; others said they were due to the fact that the water was densely covered by the aquatic weed arzolla rubra, and they suffered from asphyxia, while others asserted that the water was so polluted that it was unfit for fish to live in, this later was untenable, because the lagoon in the town is still full of fish, and the pollution, if any, has not been abated. In this particular lagoon about 3 tons of fish died /

1909

On the occasion of the visit of the Representative of Inland Fisheries and the Naturalist of this Department to the Kyalite River in October, 1909, several Murray cod, perch and catfish were caught and labelled by fixing a small silver disc bearing a distinctive number on each fish, and were returned to the water.

/ In accordance with your instructions I proceeded to Deniliquin to inquire into matters connected with the fisheries of the Edward River and tributaries, owing to a petition from residents of Deniliquin and vicinity being received by the Department / I also saw a licensed fisherman named Daish (I believe there are but two in the district). / Daish assured me that he caught no small cod fish, the average being from 15 to 30 lb.; very few being under 7 lb. in weight. The fish are caught in the latter end of winter and early spring in fairly large quantities, and forwarded to Melbourne. Daish told me that at times he had really good catches, but that as he was operating 26 miles away from a railway station his great difficulty was means of transport. / Mr. Chanter, M.H.R., whom I interviewed in Melbourne, informed me that in the summer months the fry are in immense quantities close to the banks of the streams. This statement was corroborated by all to whom I spoke. Whether the fry so seen are those of cod should be determined by the Board obtaining some of the fish for identification. The residents are certain on the matter, but as the perch are very numerous, and catfish also, it would be well to definitely settle the question by referring sample to Mr. Stead. Tench and English perch are in small quantities in the river. A fish called by the local anglers “Trout” is fairly plentiful. I have my doubts as to the identity of the latter, and have been promised that the fish shall be forwarded for identification.

Summary of fish tagged with a numbered silver label, and liberated at Dahwilly (near Deniliquin), Kyalite or Edward River, October, 1909. (From: Annual Report on the Fisheries of NSW for the Year 1909)

Species	Number	Length Range (inches)	Sex (M/F/?)	Observations
Murray Cod	11	30 1/2 – 17 5/8	4/4/3	One fish full-roed (about 3lb. weight). One fish full-roed One fish roe half developed One fish partly spent
Golden Perch (yellow belly)	24	18 – 14	19/5/0	One fish spent? Two fish full-roed One fish large roe
Macquarie's Perch	3	14 1/4 – 10 1/8	0/1?/2	
Freshwater Catfish	9	20 1/2 – 16	1/2/6	One fish large roe One fish very poor condition

1910-13

/ Columbo Creek is a good instance. This comparatively small series of billabongs is annually fished by licensed fishermen, and from its waters have been taken some hundreds of tons of Murray cod and yellow-belly alone.

Large Golden Perch or Yellow Belly.—A female example of this well-known food-fish of the western river system, weighing no less than 12 lb., was received from Columbo Creek near Coonong, in the south-western portion of this State. The fisherman who forwarded this stated he had taken this species up to a weight of 15 lb., but this is the largest so far recorded. It measured 635 mm. (25 inches).

/ The fish taken at Deniliquin in August, 1909, locally called "trout," which were similar to specimens already received from Narrandera and Wagga Wagga, as "Murray cod" has been found to be distinct from either of the species mentioned, and has been designated "trout cod." The Naturalist is of the opinion that in the trout cod has been discovered the long-lost "Oligorus mitchelli" of Castelnau, the very existence of which has been generally doubted.

1915

Early in January extended investigations in fisheries work were undertaken on the Murrumbidgee River and its tributaries, where the drought, which was of extra severity, wrought great destruction to fish life. / Murray cod and Golden Perch were dying in countless numbers in a number of large waterholes in Yanko Creek, and as many of those as possible were saved by drawing a net through the waterhole and removing all the fish which could not go through the meshes. Instead of payment in cash for assistance, the fishermen who helped in this work received the saleable fish, which they sent to Sydney and Melbourne markets alternately. It is impossible to estimate the number of fry saved, but it was certainly very great, and within a few months a fresh came down Yanco Creek, thus ensuring a stock to perpetuate the supply of fish in this stream.

It was found when netting the drying-up waterholes that hardly any of the fish caught had any food in the stomach. They were quite empty and apparently starving themselves in the middle of plenty. The water was teeming with fish food. The average temperature of the water day and night was about 83 deg. Fah.

On 19th January a terrific dust-storm with a hot wind raged all day. The temperature in a dense shade stood at about 116 deg. Fah. for hours. The following day it was noticed that dead fish were floating on the waterholes

in very large numbers. This was due in part to the heat, also to the fact that tones of dried leaves and Eucalyptus bark were driven by the wind into the water, making it almost ink-like.

On 20th January the common Hardy-head was found to be spawning in Yanco Creek. Some of those caught in the net were stripped of their ova. The fact that these fish were spawning in January seems rather peculiar, because early in October, 1914, these same little fish were seen spawning in the McIntyre River at Inverell.

/ Hearing that a party of men were visiting Boree Creek every Sunday and puddling Logan's dam in sections, arrangements were made to visit the dam on Sunday morning. On arrival at 8 a.m., after a 40 mile journey by motor, it was found that the dam had been puddle overnight, and the poachers had gone. Many dead fish were floating about in the muddy waters. Hundreds of catfish were found thrown out on the bank where the puddling had been done in Boree creek, deliberately wasting much valuable food.

/ Many thousands of fish died in the Billabong Creek, which runs through the town of Jerilderie. There was a considerable depth of water in Brennan's weir, which did not go dry, and the fish therein would be sufficient to restock this creek.

1929
On one occasion the writer was on official service on Yanco Creek near Yathong, when a 16 inch freshet came down. Within twenty-four hours countless numbers of Murray cod, perch (three varieties) and miniature fishes were floating on the water near the camp dead or dying and probably none recovered.

1934
With a view to re-stocking Pine Lake and Wimmera River, in Victoria, permission was accorded to the Horsham (Victoria) Anglers' Club to transplant not more than 100 fish from Wakool River. The club's efforts resulted in 85 Murray cod and Golden Perch being transferred.

20.7 Riverina Catchment Oral Histories

The following oral history (OH 52) mostly discusses the Riverina Catchment.

OH 52
The Late Bert McKenzie of Ruffy was interviewed in July 1982 at an age of 82 years.
(From Trueman & Luker, 1992).
Out on the white waterholes I never caught a cod under six pounds for two years. Apparently in the third year, I don't know the conditions but you've got to guess it, it was just tig tig with little wee chaps and now and then one would fluke hook himself and it was a bit of a lesson. That was in the Yanco Creek actually which flows out of the Murrumbidgee and into the Billabong Creek. The White Waterholes were twenty one miles upstream of Jerilderie, John and Jack Curtain were the two owners of the property, a beautiful property, and I think 'Woodpark' was the name of the property. It was really good for spinning. On the spinners you caught the occasional bluenose, not many, just the odd one you would get, but the Murray cod were the main ones. From six to fifteen pounds was about the run though I did lose a couple of thirty pounders.

We caught practically everything, the yellowbellys, I got fourteen pounds and hundreds of twelve, eleven and ten pounders. We threw the three pounders back in again of course. We caught the grunters only in sections. They did run one particular time I went out and they were up to seven pounds. I fished that area about 1939-41. There were Catfish there but not in any quantity. I fished at 'Hartwood' Station on the Billabong Creek and the Catfish were thick. And don't tell me they don't fight! Just try a seven pound Catfish. We also caught there Macquaries, grunters, and there were a few bluenose there as well as many Murray cod.

21 Lower Murray River Catchment

The big cod is a cannibal. About that I have a most interesting note from Mr. R. J. Larsen, of Elsternwick, who says that in the middle nineties he was a market fisherman on Lake Victoria, on the lower Murray. Of more than three tons of cod taken not one was under 30lb. On one occasion he came upon 18 fish isolated in a closed lagoon, all of them so poor as to be unfit for market, though in condition they would have averaged 40lb. apiece. The cod is its own worst enemy, and in this lagoon the fish had gradually eaten one another down to a gaunt state of famine.

A Triton of the Billabongs.

One year Lake Victoria went nearly dry, and among the tons of cod that perished all were big fish. In keeping them alive in a well boat until they could be sent to market Mr. Larsen found it necessary to paddock them in separate compartments according to size, for even there the large cod would swallow the little ones. Once he found that a cod of 117lb. caught in a drum net contained a smaller fish of 15lb. He can speak very positively about it, because he weighed both fish. Here was a Triton of the billabongs, a 15lb. fish that anglers would have been well content to capture, reduced to the rank of minnow in one voracious mouthful. No doubt at all, it seems, about the cod being also a cannibal, and no doubt that, with cod as the medium of fish culture, method is the essence of the undertaking.

Argus, 27 February 1932

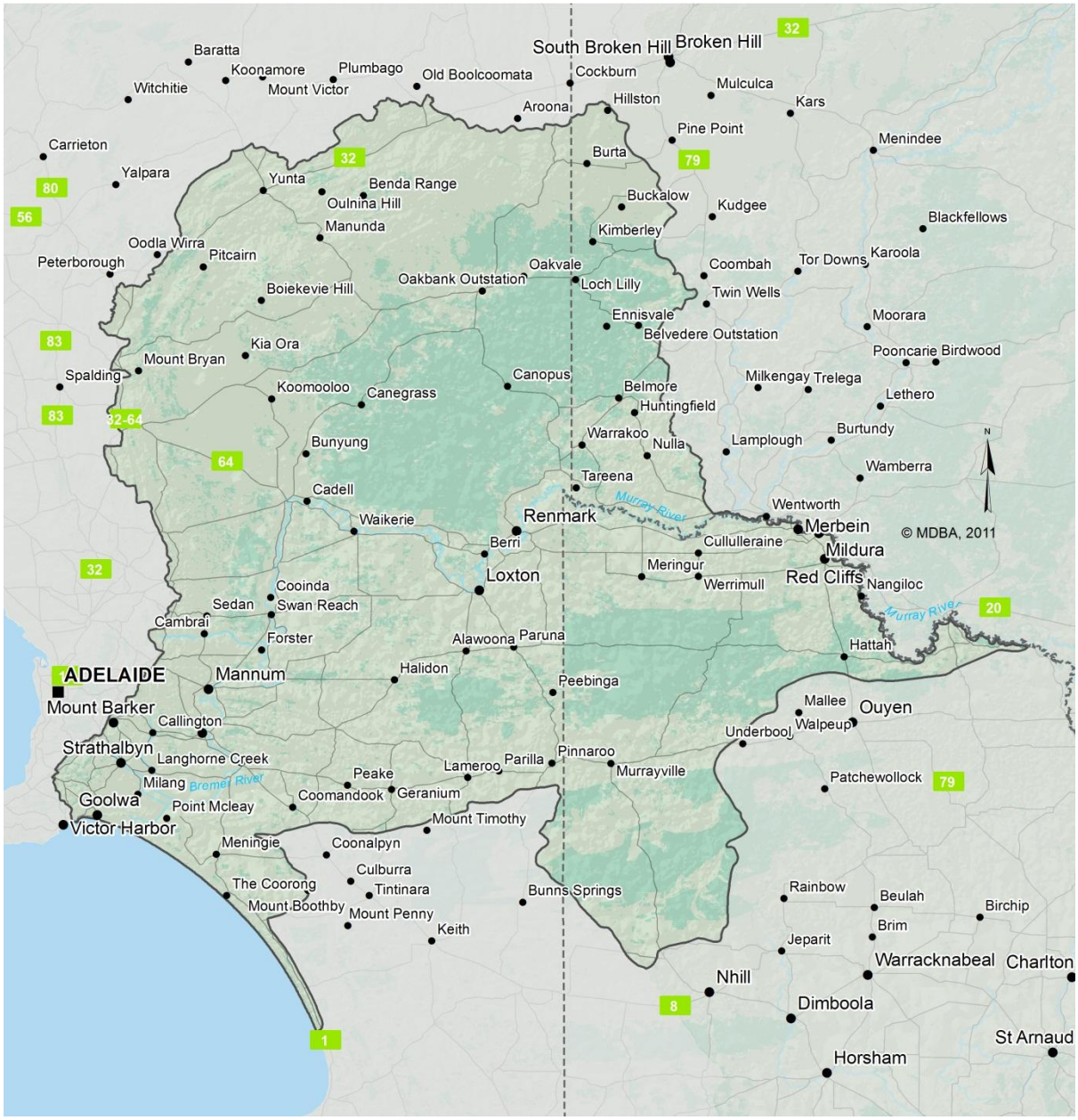
The big cod is a cannibal. About that I have a most interesting note from Mr. R. J. Larsen, of Elsternwick, who says that in the middle nineties he was a market fisher-man on Lake Victoria, on the lower Murray. Of more than three tons of cod taken not one was under 30lb. On one occasion he came upon 18 fish isolated in a closed lagoon, all of them so poor as to be unfit for market, though in condition they would have averaged 40lb. apiece. The cod is its own worst enemy, and in this lagoon the fish had gradually eaten one another down to a gaunt state of famine.

A Triton of the Billabongs.

One year Lake Victoria went nearly dry, and among the tons of cod that perished all were big fish. In keeping them alive in a well boat until they could be sent to market Mr. Larsen found it necessary to padlock them in separate compartments according to size, for even there the large cod would swallow the little ones. Once he found that a cod of 117lb. caught in a drum net contained a smaller fish of 15lb. He can speak very positively about it, because he weighed both fish. Here was a Triton of the billabongs, a 15lb. fish that anglers would have been well content to capture, reduced to the rank of a minnow in one voracious mouthful. No doubt at all, it seems, about the cod being also a cannibal, and no doubt that, with cod as the medium of fish culture, method is the essence of the undertaking.

Argus, 27 February 1932

Figure 21.1 The Lower Murray River Catchment showing major waterways and key localities



21.1 Early European Accounts

Mathew Flinders, during his circumnavigation of the Australian continent in 1802, had as one of his goals locating the entrance to the mythical inland sea of the continent. While he skirted the coastline of the area he failed to record the mouth of the Murray River, the relevant part of the map he produced being left blank. On the 9th of February 1830, Captain Charles Sturt travelling by boat downstream reached Lake Alexandrina. The lake stunned him with its beauty, and the following day he reached the Murray mouth:

> I was not disappointed; but the view was one for which I was not altogether prepared. We had, at length, arrived at the termination of the Murray. Immediately below me was a beautiful lake, which appeared to be a fitting reservoir for the noble stream that had led us to it / At the time we arrived at the end of the channel, the tide had turned, and was again setting in. The entrance appeared to me to be somewhat less than a quarter of a mile in breadth (Sturt, 1833).

George French travelled from the Murray mouth upstream during the mid 1840s recording the environment, the practices of indigenous people, and life in the fledgling European settlements. In Lakes Alexandrina and Albert, and in the river several hundred miles upstream, French observed and recorded the fishing practices of the indigenous people:

> The cod of the Murray, and a fish in the lake resembling a salmon, are taken with rude hooks. A small cat-fish called pomery is speared from their canoes, in the shallows amongst the weeds; and the golden perch are driven out of the rushes near the banks and struck with the fishing – spear. / one man will dive near the roots of an old tree, where a cod (ponkoo) is expected to be, making noises to frighten out the fish, which, as it darts out, is speared by a semi – circle of natives, standing all in readiness to strike it. During the night, several bark canoes will go out upon the river, one keeping the middle of the stream, and the others on either side. In the stern of each of these frail boats is a round piece of bark, and on the bark, struck upright in a coating of mud, are several pieces of kordkoo, the wood of a tree producing manna, which are lighted. A native stands with his back to the light, and as the fish rise he strikes them with the mugaroo, or fishing spear. Large nets are also used by the Moorundi tribes for the purpose of capturing fish (French, 1847).

In 1848, George Hamilton wrote a lengthy article on fishing in South Australia, including a detailed account of the fishery at Morunde Station just downstream from Blanchetown:

> There are four kinds of fish that can be taken by rod and line – the cod, the pulyee, the colubco, (carp) and the toorroo, or black perch. They generally run from five to fifteen pounds weight, are all well flavoured, especially the cod, and will reward the angler at dinner time for his exertions. / In very short time we had eight and forty tooroo in the boat. This fish, when caught, makes a singular humming noise, in consequence of which, I fancy, the natives have given it the name tooroo, as that would somewhat resemble the sound. / I was disatisfied with their size, the largest not exceeding two pounds in weight. / However, cheered by the black fellows, who were in ecstacies, I held on, and soon saw rise to the surface a fine spotted 'pulyee.' / The pulyee is a singular kind of fish / it is spotted and scaleless; and from its upper lip flesh protuberance hang down (*Argus,* 19 September 1848).

The bounty of fish present in the lower Murray and its lakes, combined with its proximity to Adelaide, ensured the establishment of a commercial fishery from an early date. The earliest commercial fishermen were the indigenous people who sought financial remuneration to obtain the trappings of the European way of life. In 1861 a fishmonger from Mount Barker described how white 'boatmen', who acted as intermediate merchants to the fishmongers, relied upon the supply of Murray cod from the local aboriginal people (*Adelaide Register*, 5

December 1861). Eventually the Europeans took up fishing as a living, and the fish obtained were not only marketed in Adelaide, but as far away as Victoria. Encounters with large cod created many stories and legends, and gained some infamy with reported attacks against large animals and humans. A newspaper account records that a large Murray cod seized a foot dangled in the river near Blanchetown, nearly dragging the man into the river; and that a 90 lb. fish attacked the leg of a horse wading the river at Westons Flat with the fish subsequently being dragged ashore. It was implied that some unexplained cases of drowning were the result of attacks by giant cod (*Adelaide Register,* 20 May 1892). What may be the largest cod reported from the Lower Murray weighed 225 lb. (102.3 kg) and was taken near Cobdogla at the mouth of Chambers Creek (*Adelaide Advertiser,* 12 December 1935). The head of that fish, or possibly a larger example, was given to the South Australian Museum (*Adelaide Advertiser,* 13 December 1935).

While the Murray River supported vast numbers of edible fish, other waters in South Australia did not, and there were a number of efforts made to establish Murray fish in waters around the state. In 1913, 200 Murray cod were translocated from Wellington to Lake Bonney near Millicent; in 1922, cod were translocated to Valley Lake near Mt Gambier; in 1925 Robe Lakes were stocked; and in 1915-26 over 100 cod were released into Mosquito Creek near Naracoorte and Lucindale (*Adelaide Advertiser,* 17 May 1935). Additional cod were released in Lake Bonney in 1914 and 1915 (*Adelaide Advertiser,* 22 April 1914; 31 July 1915). In 1894, Murray cod and Golden perch were captured from the Murray River near Tailem Bend and Lake Alexandrina. They were transported to the Avon River in West Australia, where cod eventually became established (*Western Mail,* 24 March 1894; *West Australian,* 13 February 1895; Morrisy, 1970).

In 1850, the South Australian Government offered a reward for the first boat to navigate the Murray upstream to the Darling junction, to demonstrate boating as a viable means of transporting produce. In 1853 the *Lady August* under the command of Francis Cadell, and the *Mary Ann* captained by William Randell, raced each other up the Murray with the goal of winning the prize. Both navigated the river as far upstream as Swan Hill, and in the case of the *Mary Ann* reached Echuca. Their success heralded the start of riverboat traffic (Mudie, 1961). A number of lengthy shallow bars between Blanchetown and the border proved to be an impediment to the passage of the boats. Locks were initially conceived for the purpose of improving navigation, but by the time they were constructed their primary function became the diversion and storage of water for irrigation purposes. Originally it was proposed to construct 26 locks along the length of the Murray, though ultimately only 14 were built. The first was built near Blanchetown by the South Australian Government in 1913. Between 1922 and 1935, a further nine locks were constructed on the Lower Murray between Wentworth and Blanchetown. These structures effectively changed the riverine habitat into a series of pools (Eaton, 1945). In order to improve freshwater storage in the lower lakes for irrigation purposes, construction commenced in 1931 on a series of barrages located on the Murray Mouth at Goolwa and the Coorong, to prevent the influx of brackish water into Lakes Alexandrina and Albert (*Adelaide Advertiser,* 29 March 1940).

Towards the end of the nineteenth century concern was expressed by fishermen over the state of the fishery. This led to the establishment of an inquiry into the health of the fishery in 1900. The investigation was led by two senior Inspectors of Fisheries from South Australia, with input from NSW representatives Harald Dannevig and David Stead, who subsequently prepared a formal report (NSW Government, 1903). It concluded that declines had been observed in the cod fishery in the lower Murray, though a substantial fishery still existed. In particular, the importance of the cod fishery in Lakes Victoria and Bonney was noted, as was their perceived significance as nurseries for juvenile cod. The inquiry proposed a number of recommendations for the management of the fishery, including the introduction of a closed season, and the total closure of those lakes to commercial fishing to protect them as nurseries. As a result of the inquiry parts of the river, including Lake Bonney and all creeks, were closed to commercial fishing. In addition, a closed season for all waters from mid-September to mid-December was introduced (*Adelaide Advertiser,* 17 October 1903). Following lobbying by

fishermen, some regulations were relaxed. These included a contraction of the closed season, with the river below Blanchetown remaining open year round (*Adelaide Advertiser,* 14 August 1905). A conference held in Melbourne in May 1905 between the states made further recommendations for the management of the inland fishery (*Argus,* 5 August 1905). South Australian authorities held further enquiries during the 1930s (*Adelaide Advertiser,* 29 May 1935, 11 June 1935).

Colonel John Langtry, during his post World War Two investigation of the Murray River fishery, conducted survey operations in the lower reaches of the Murray in NSW and some adjacent waters, but did not venture into South Australia. In late 1949, Langtry reported the presence of good numbers of Murray cod, Golden perch, Silver perch and Catfish from the major anabranches and tributaries of the river, but failed to take any Catfish in the Murray near locks 7, 8 and 9. He highlighted the failure to catch both Blackfish and Trout cod in the region and recounted the observation of commercial fishermen that no Trout cod had been taken from the area during the previous fifty years (Cadwallader, 1977).

21.2 The Past Distribution of Fishes in the Lower Murray River Catchment

The *Sustainable Rivers Audit* (Davies *et al.,* 2008) identified the Lower Murray River as being the section of river downstream from Lock 10 to its confluence with the Southern Ocean below Lake Alexandrina. Most of this catchment is at an altitude of less than 200m ASL, identifying it as lowland habitat, though some tributaries draining the Mt Lofty Ranges exceed this altitude and flow through slopes type habitat. The lower Murray was divided into geographical zones consisting of an upper zone from Lock 10 near Wentworth to Overland Corner (near Lake Bonney), a middle zone from Overland Corner to Mannum, a lower Zone from Mannum to the sea including Lakes Alexandrina, Albert and the Coorong Lakes; and a Mt Lofty zone encompassing all tributaries to the west of the Murray River from Morgan to the sea.

The Action Plan for South Australian Freshwater Fishes provided a comprehensive summary of known records of native fish in the Lower Murray and reported the current status of their populations (Hammer *et al.,* 2007). The authors identified the need to collect further oral history to eliminate knowledge gaps on the original status of many species along the length of the Lower Murray and its tributary streams. The oral history of the Lower Murray was not actively researched during the course of this project; however, additional historical material was identified and is presented here to clarify the original distribution and abundance of Trout cod and a number of other species. Most of the information gathered below was sourced from a number of detailed newspaper accounts, a few old photographs, and the writings of early settlers and naturalists. No additional information was located on the Mt. Lofty Zone, except for some details of fish translocations. As a result this zone has not been considered. Apart from Murray cod, Golden perch, Silver perch, Catfish and Bony Herring, few historical accounts exist of other native fish in this catchment and a project dedicated to locating written material, photographs and oral history is warranted.

Murray cod were abundant in the Lower Murray along the length of the river, as well as being found in lagoon and lake habitats. In the early years, cod up to 160 lb. (72.7 kg) in weight were considered by commercial fishermen to be not unusual, and one angler recalled that around the 1880s 'we were always catching young cod of ¾lb. to ½lb. or even less' (*Argus,* 28 March 1935). At Lake Victoria in 1898, a Fisheries Inspector described the lake as 'swarming with cod' (Stead, 1903). In one instance in the 1890s, there was a catch of three tonnes of cod taken from the lake, with all the fish weighing over 30 lb. (13.6 kg) (*Argus,* 27 February 1932). During the drought of 1914/15, Lakes Victoria and Bonney were re-opened to commercial fishermen to salvage the fish. In 1914, hundreds of tonnes of fish were taken by commercial fishermen, including cod up to 50 lb, from Lake Bonney. (22.7 kg) (*Adelaide Advertiser,* 12 December 1935) By early 1915 the catch of fish was estimated at three tonnes a week (*Adelaide Advertiser,* 14 May 1915). As late as 1912 cod were so common

near Renmark and Loxton that they were used as pig feed (*Adelaide Advertiser,* 11 September 1912), and small cod were very common near Morgan in the 1950s (*Burra Record,* 20 April 1954). Cod of all sizes were abundant above Blanchetown in both the river and lagoons, and it was reported that they spawned in anabranches off the main river (*Adelaide Register*, 20 May 1892). Cod were normally abundant in Lake Alexandrina, with fish up to 112 lb. (50.9 kg) being taken (Peirce, 1849); though near Milang they would move upstream at times of high salinity (*Adelaide Advertiser,* 4 May 1892).

Berra (1974) reported the existence of two museum specimens of juvenile Trout cod collected in South Australia, one of which he examined. A recent examination has indicated that the second specimen is a Murray cod (Michael Hammer, pers. comm.). The one confirmed specimen was captured in January 1932 from the Murray River at Purnong near Mannum. It has been suggested that this specimen may have been displaced downstream by a major flood during 1931 and, based on the few records the existence of a significant population in South Australia, has been open to question (Hammer *et al.,* 2007). Stead in 1903, recorded that in South Australia 'Now and again also a "rock cod" is mentioned' (Stead, 1903) while Amandus Zeitz, who provided the identification of the 'rock cod' to Stead as *Oligorus mitchelli.* did not report the existence of the second cod species in his publications (Zeitz, 1902, 1908). Trevor Scott, of the South Australian Museum, in some unpublished annotations, recorded reports collected from fishermen during May to June 1935 stating that there were two types of cod. Trout cod were referred to as a 'rock cod' by the fishermen downstream of Lock 6, but there is no indication that Scott examined one (Hammer *et al.,* 2007). Scott later concluded that Trout cod had been previously widespread in the Murray in South Australia, but had disappeared by the 1970s (Scott *et al.,* 1974).

Three early historical accounts clarify the original abundance of Trout cod in the Lower Murray. An 1892 news story in the *Adelaide Register* was written by a commercial fisherman based at Blanchetown. Much detail about the fishery back to the great flood of 1870 was detailed, including observations of Trout cod some distance upstream. Although unidentified, the author was probably well known long-time local fisherman W. J. (William) Nott who corresponded with the paper on a number of issues relating to fishing around that time (e.g., *Adelaide Register,* 8 February 1892). The author identified the existence of a second cod species in the lower Murray which he called a 'rock cod', providing some physical details that suggested they were Trout cod, he stated 'The rock cod are very rarely caught about here' (*Adelaide Register,* 20 May 1892). David Stead, recalling an investigation he conducted in 1910, wrote that 'Under the name of Rock Cod the Trout Cod is very well known, and quite abundant, in the lower Murray from Wentworth well down into South Australia' (Stead, 1929b). Stead's observation is partially supported by anecdotes provided to the author by senior commercial fishermen during the 1970s who recalled that 'rock cod' were regularly captured in the Murray River, particularly in faster sections near rock bars between the border and Renmark during the 1920s. A newspaper account written by retired commercial fisherman R. J. Larsen recorded many observations on the 'Murray trout' (*Argus,* 12 February 1932). Another article stated that he had worked in the Lake Victoria district during the 1890s (*Argus,* 27 February 1932), suggesting that those observations were obtained in that area and that Trout cod had a significant presence in the region.

There is a continuous historical record of Trout cod being present in South Australia, starting with Nott's account recalling the fishery back to c1872, up to the reports from fishermen in the mid 1930s, cited by Scott downstream of Lock 6. Three sources, namely Stead, Scott and fisherman's anecdotes, suggest that Trout cod had a significant presence from Wentworth to Renmark. This reach of river prior to the construction of locks contained areas of fast water flowing over exposed rock (Victorian Government, 1867), a habitat with which Trout cod were strongly associated. Other evidence, including the detailed news account, suggests that Trout cod were rare downstream of Renmark where the river was slower. Overall, it appears that Trout cod were locally common in the upper Lower Murray River but fairly rare in the middle and lower zones.

Zeitz (1908) recorded Golden perch to have been abundant in both the river and lagoons along the length of the Lower Murray, as well as being abundant in Lake Bonney (Stead, 1903). At Murray Bridge the average Golden perch kept for market weighed two lb. (0.9 kg) (*Adelaide Advertiser,* 4 May 1892). A similar average size was reported near Blanchetown, with fish of eight lb. (3.6 kg) considered large. Migrations took place in this area (*Adelaide Register*, 20 May 1892). In 1910, Golden perch were estimated to have been half of the total catch of fish in the river upstream of Murray Bridge (*Adelaide Advertiser,* 17 December 1910). In the mid 1950s nearly 350 tonnes were recorded as being taken by commercial fishermen. While there were considerable annual fluctuations as late as 1997, the catch often exceeded 300 tonnes (Hammer *et al.,* 2007). Early newspaper accounts indicate that Silver perch were also abundant throughout the Lower Murray. On one occasion near Blanchetown, 48 fish up to two lb. (0.9 kg) were taken by angling (*Argus,* 19 September 1848). They were abundant in faster flower creeks over areas of weed with fish up to five lb. (2.3 kg) being captured (*Adelaide Register*, 20 May 1892), and were identified by a fishing inspector as a fish that could be taken anywhere along the river (Dannevig, 1903).

The original status of Macquarie perch in the lower Murray remains unclear. Stead did not record their presence during the inquiry into the South Australian cod fishery (Stead, 1903). Waite concluded that the species was 'apparently unknown in the lower Murray' (Waite, 1923), and they were not recalled as being part of the fishery near Blanchetown (*Adelaide Register*, 20 May 1892). It has been reported that three museum specimens have been collected in South Australia (Scott *et al.,* 1974), though recent examination of a suspected juvenile has indicated that it is a Golden perch (Michael Hammer, pers. comms). The two others specimens are adults collected in 1917 and 1918 (Hammer *et al.,* 2007), one being sourced from 'Daws Fish Market' adjacent to the Adelaide Central Market, and the other from the 'South Australian Hotel' (Ralph Foster, South Australian Museum, pers. comms). It has been suggested that the museum specimens collected in South Australia were obtained from the Renmark or Morgan areas, and may have been swept downstream by the large flood of 1917 (Hammer *et al.,* 2007).

Lake reported the former presence of Macquarie perch in South Australia, though did not provide any details. It is likely he sourced his information from commercial fishermen (1967b). A newspaper account indicated that Macquarie perch were present in lagoons in the Lake Victoria district in the 1890s and, while plausible, does not provide enough detail to be conclusive (*Argus,* 27 February 1932). Elderly commercial fishermen with first-hand knowledge of the lower Murray River in the 1920s and 30s, informed the author that small numbers of 'freshwater butterfish' or 'white eyes', names widely used for Macquarie perch in the Central Murray, had been regularly taken as far downstream as the Renmark area. They were captured in the same areas frequented by Trout cod and at times 'runs' of fish occurred, with up to a dozen 'white eye' being taken in a single drum net. On balance, with the limited existing evidence, it appears that Macquarie perch had a permanent presence but were scarce in the upper Lower Murray with only vagrants existing further downstream.

Prior to the construction of locks, early accounts suggest that was a considerable variation in the abundance of Catfish along the Lower Murray. Catfish were reported by Langtry to have had a strong presence in Lake Victoria, the Lindsay River and Walpolla Creek in 1949 (Cadwallader, 1977). There are excellent historical accounts suggesting the species was abundant in the river and lagoons upstream near Merbein (Blandowski, 1858; Cadwallader, 1977; *Argus*, 7 July 1925). In the middle Lower Murray historical accounts indicate that Catfish were regularly taken, but not in abundance. Near Wellington it was reported for Catfish that 'there was very few of these taken', and at Tailem Bend and Murray Bridge, Catfish were not recorded as a species taken in numbers from the river (*Adelaide Advertiser,* 4 May 1892).

The Chief Inspector of Fisheries Samuel McIntosh in 1900 reminisced how in the past he could 'by throwing a line in practically anywhere not only callop and bream, but cod, could be caught'. He omitted Catfish from this list, suggesting a comparatively lower abundance for this fish than the other three species nominated (Dannevig, 1903). They were taken up to in excess of ten lb. (4.5 kg) in weight near Blanchetown (*Argus,* 19 September 1848) and though regularly captured were considered to be 'not very abundant' (*Adelaide Register*, 20 May 1892). In latter years Catfish were recorded as being common near Morgan, though not as prevalent as small cod (*Burra Record,* 20 April 1954). Photographic evidence suggests they were less common than the other major species (MR75). They were regularly taken at Mannum (*Adelaide Advertiser,* 27 January 1933), and were abundant in the lower lakes (French, 1847). Zeitz inferred that the species was common in the river just upstream of Lake Alexandrina from the numbers he saw at market (Zeitz, 1902). The historical evidence indicates that Catfish were generally abundant in lakes, lagoons and anabranches along the lower Murray. In the river itself they were abundant in the upper zone, comparatively scarce in the middle zone and abundant in the lower zone.

Very few historical accounts exist of Blackfish in the Lower Murray, with the only recent records from the Mt Lofty Zone streams (Hammer *et al.,* 2007). Blandowski recorded Blackfish as being present in lagoons along the Murray River near Merbein in 1857 near the boundary of the central and lower Murray (Blandowski, 1858). Newspapers record their presence in lagoons and occasional captures from the river in that area (*Argus*, 2 February 1922, 7 July 1925). Langtry reported an absence of Blackfish in the Lake Victoria area in 1949 (Cadwallader, 1977). In the early twentieth century Zeitz (1902) reported Blackfish as being present in the lower Murray River, the Torrens and Onkaparinga Rivers. A letter to the editor written in 1932 about the impact of pelicans on the Coorong Lakes fishery discussed how the birds reputedly took large numbers of small fish and stated 'a five-inch blackfish weighs two ounces, which would be a fair average' implying that they were common (*Adelaide Mail*, 13 August 1932). Another newspaper article in 1935 considered that Blackfish were 'in particular a real delicacy' and that efforts should be made to introduce them to dams and lagoons that didn't have them (*Adelaide Advertiser,* 26 February 1935). A 1950 article on managing farm dams for growing table fish listed 'slipperies' as a species present in dams (*Adelaide Advertiser,* 17 August 1950). While not specific, these articles suggest that Blackfish were well known and widespread in south east South Australia. Blackfish were probably rare in the Lower Murray River but common away from the main channel in lagoons, with the records provided by Zeitz implying that they may have been common in the lower lakes.

Hammer *et al.* (2007) reported the collection of Museum specimens of Estuary perch at the top of Lake Alexandrina in 1932 and 1963. They suggested that the species had been rare in the river, though cited aboriginal oral history that implied they had been common in the Coorong Lakes. Oral history indicates that they had been common near the mouth of the river prior to the construction of the barrages. In recent years the species has been recorded upstream near Swan Reach (Lintermans, 2007). Zeitz (1902) reported Estuary perch to been found in the Lower Murray in freshwater down to the mouth, and recorded the aboriginal name of 'Taralga' for the species implying a significant presence. A closed season for 'Gippsland perch' in South Australia was introduced in 1929 (*Adelaide Advertiser,* 31 May 1929). The limited evidence suggest that Estuary perch had been at least common in the lower lakes, and probably rare in the middle Lower Murray.

A newspaper account, describing the 'koongulde' as being a superior table fish to both 'English sprats' and sardines and being most commonly taken in winter, is the earliest historical account of Congolli in the Lower Murray (*Adelaide Observer,* 25 November 1865). Congolli were reported as being originally abundant in the Lower Murray (Zeitz, 1902). They were commercially fished in the lower lakes (Hammer *et al.,* 2007), and near Mannum were targeted by commercial fishermen in large numbers during winter migrations (*Adelaide Advertiser,* 4 May 1892) and at the Murray mouth (*Adelaide Advertiser,* 18 June 1892).

Eels were occasionally reported near Blanchetown (*Adelaide Register*, 20 May 1892). A 19 lb. eel was captured from the Murray River at Caloote near Mannum 1905 (*Adelaide Advertiser,* 24 May 1905) and one over five feet in length, was taken near Blanchetown in 1909. This was the first specimen known to the South Australian Museum (*Adelaide Advertiser,* 5 February 1909). Large eels were also reported to be occasionally caught near Murray Bridge (Stead, 1903) and were said to be common in some farm dams near Lake Victoria (*Argus,* 15 September 1922). The collective evidence indicates that they were rare but present throughout the Lower Murray. Lampreys, probably Short-headed lampreys and possibly Pouched lampreys (Lintermans, 2007), were recorded as being taken in the Lower Murray (Stead, 1903). It has been suggested that Short-head lampreys may have been originally common, being historically recorded at Blanchetown, Sunnyside and recently near Milang and Mypolonga in the lower zone. They were also recorded as being found at Devon Downs in the middle zone of the Lower Murray (Hammer *et al.,* 2007). With historical accounts recording Lampreys to have been present and common in the Central Murray (*Argus,* 12 April 1921), it is likely that they would also have been common throughout the Lower Murray. A seal was reported as living in swamps between Renmark and Loxton in 1932 (*Adelaide Advertiser,* 16 December 1932; *Argus,* 9 February 1946).

21.2.1 Estimates of Native Fish Abundance in the Lower Murray River Catchment at European Settlement.

Presented below are the rarity scores used in the *Sustainable Rivers Audit* (Davies *et al.,* 2008) which were developed by an expert panel using historical evidence available prior to 2008. They indicate the probability of capturing a particular fish species using standardized survey techniques such as electrofishing. They are compared to those developed in the *True Tales* Project using more recently obtained historical evidence and are based on the typical size of angler catches in the oldest accounts.

Table 21.1 Lower Murray River Catchment Rarity Scores (Main River Channels)

	Lower Zone (Mannum to Murray Mouth)		Middle Zone (Overland Corner to Mannum)		Upper Zone (Lock 10 to Overland Corner)	
Species	**SRA**	**True Tales**	**SRA**	**True Tales**	**SRA**	**True Tales**
Trout cod	1	L1?	3	U1	3	**3**
Murray cod	5	**5**	5	**5**	5	**5**
Golden perch	5	**5**	5	**5**	5	**5**
Silver perch	5	**5**	5	**5**	5	**5**
Macquarie perch	0	0?	0	L1?	1	U1
Catfish	5	**5**	5	**3**	5	**5**
'Blackfish'	1	L3?	1	1?	0	1

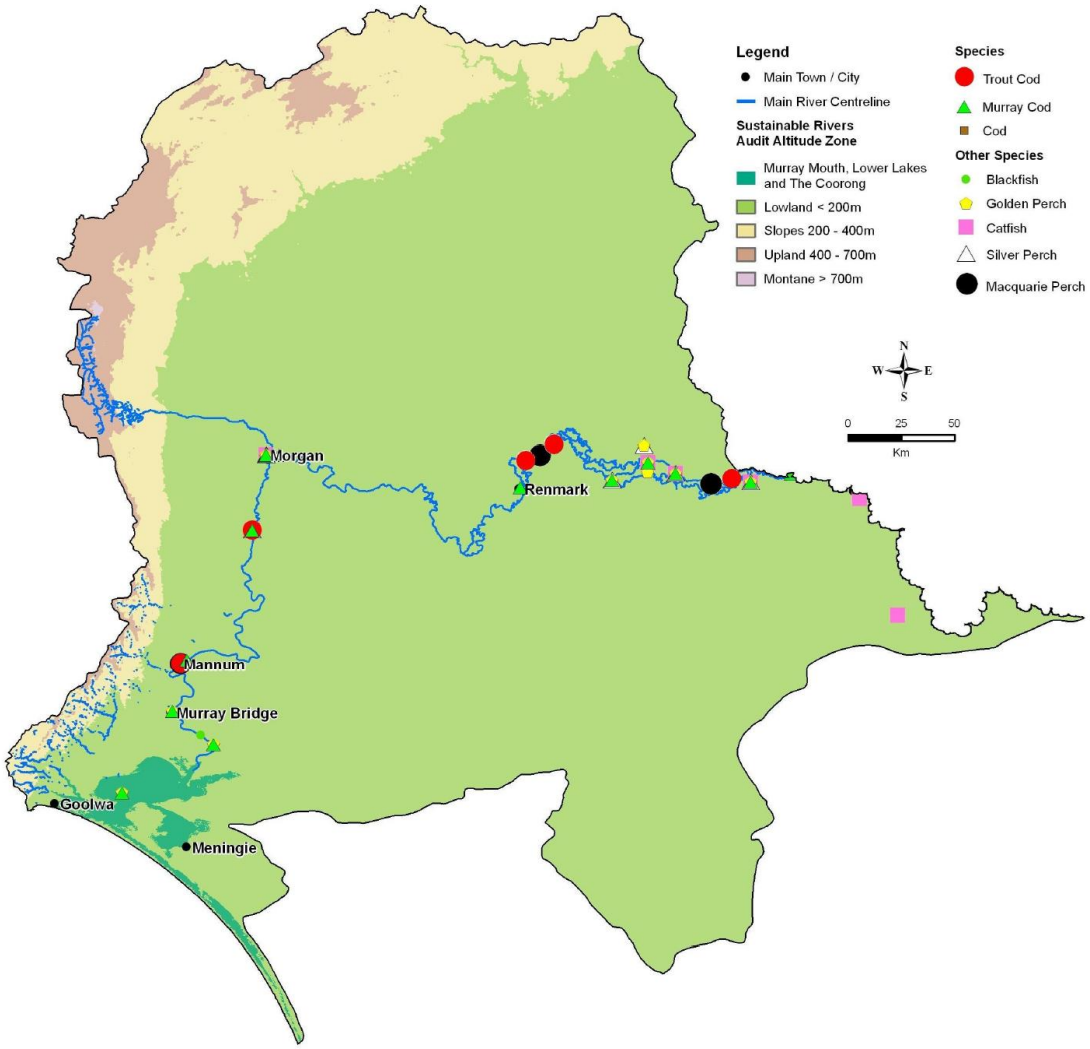
Key

0 = Absent: no credible account reporting the species former presence
1 = Rare: a few individual fish could be expected to be taken by a resident angler each year
3 = Common: regularly taken by a resident angler in small numbers
5 = Abundant: frequently taken by a resident angler in good numbers

L = abundance at the lower end rating
U = abundance at the upper end rating

Ratings in bold type supported by multiple accounts or lines of evidence e.g. Oral history, newspaper accounts, photographs

Figure 21.2 Historical Records for Native Fish in the Lower Murray River Catchment



Photograph 21.1 A Week's Work at Renmark

Photo State Library South Australia B 45136. A catch of 1800 lb. (818.2 kg) of cod being prepared for the Adelaide Market at Renmark in 1898-1908. It was the result of a week's effort for three men, who probably kept the fish alive by tethering or holding them in well boats. Reproduced with permission from the collection of the *State Library of South Australia.*

Photograph 21.2 A Large Catch at Renmark

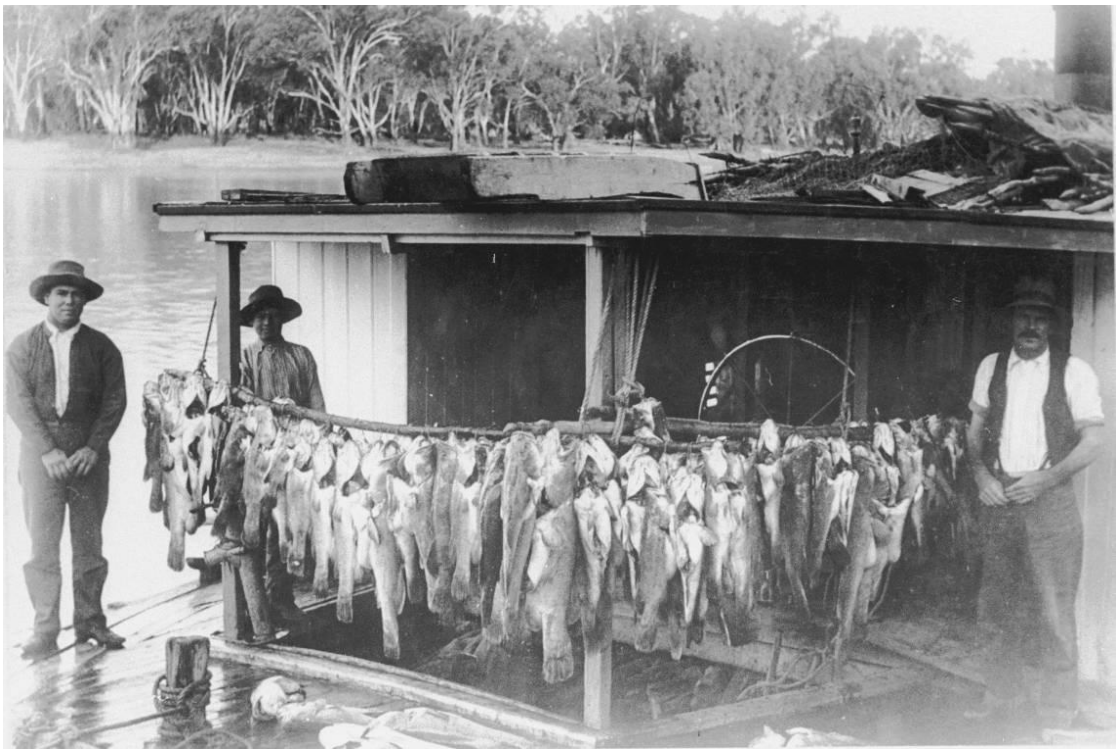


Photo State Library South Australia PRG 1258/1/2600. One of two photographs of a catch of cod on board the P.S. Mayflower taken at Renmark Warf 1910-14. The photo illustrates the importance of the commercial cod fishery in the Lower Murray at that time. Close examination of the original images suggests that few if any Trout cod are in the catch. Anecdotes from commercial fishermen recalled the species to have a patchy distribution upstream of Renmark but at certain locations were common. Reproduced with permission from the collection of the *State Library of South Australia.*

Photograph 21.3 A Large Golden Perch

Photo State Library South Australia PRG 1258/1/4007. Tommy Cartwright of the P.S. William Davies holds a large Golden perch caught from the Murray River at Ned's Corner in 1931. By this time a significant decline had occurred in the cod fishery of the lower Murray and Golden perch formed the staple of the commercial fishery. Photo reproduced with the permission from the collection of the *State Library of South Australia.*

Photograph 21.4 Fishing Party Near Morgan

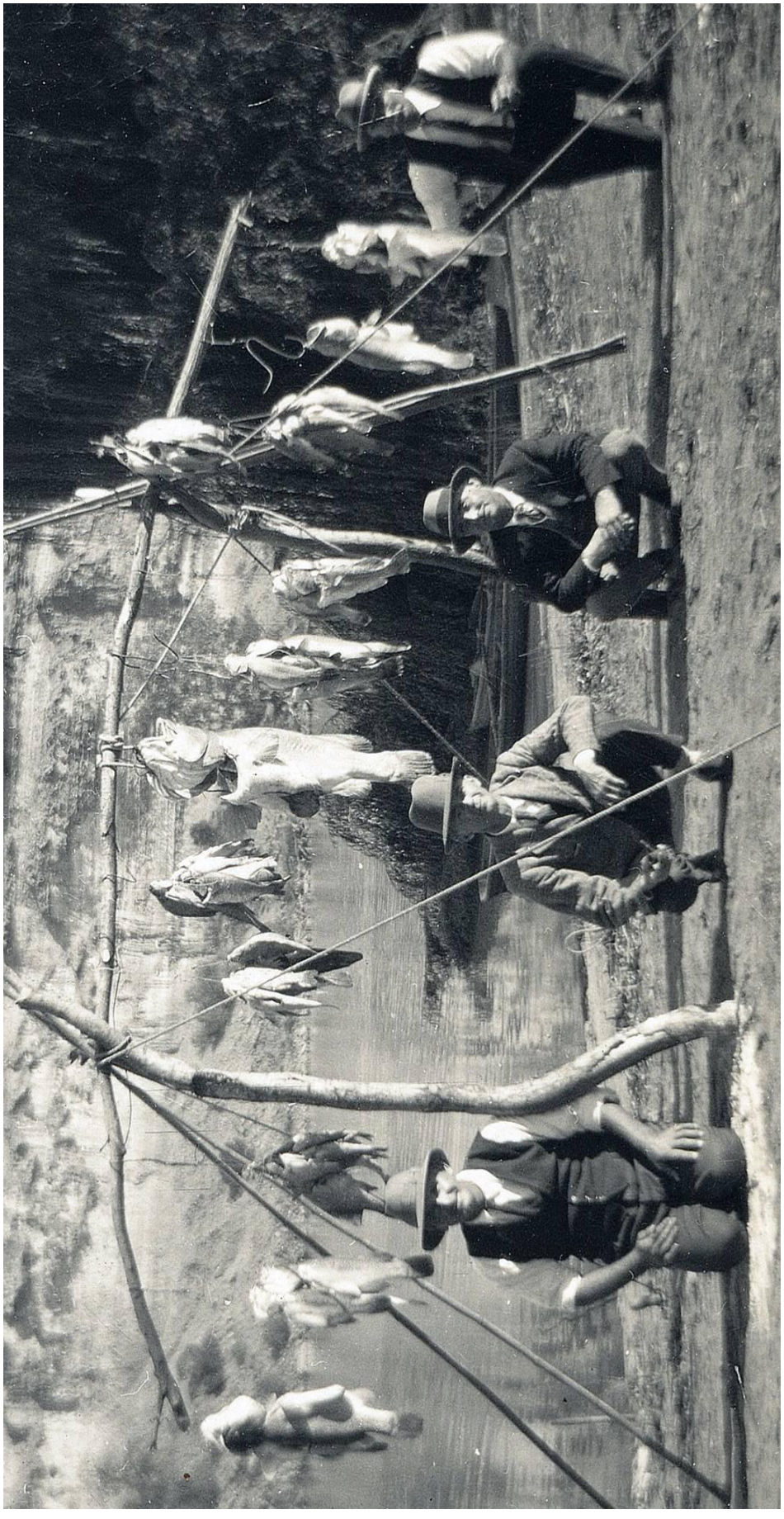
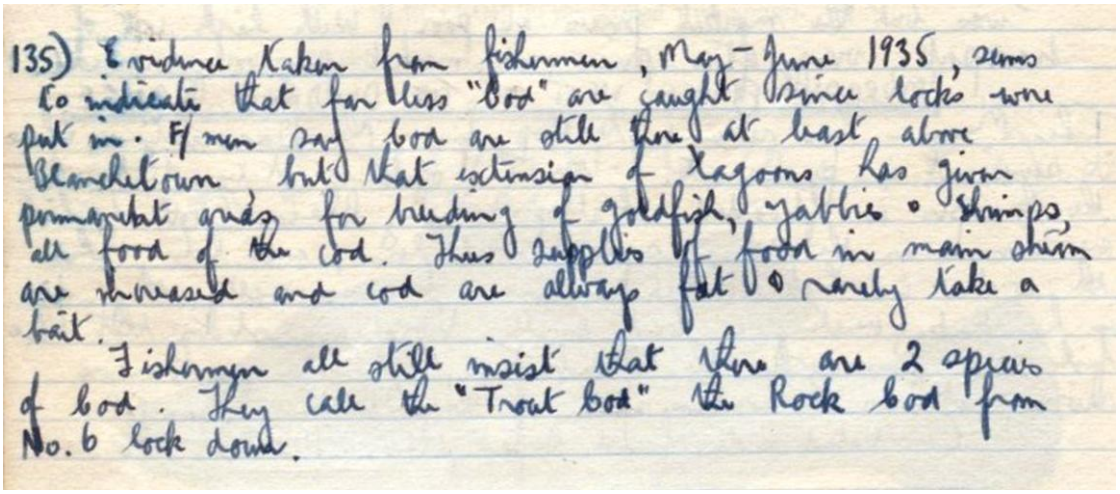


Photo MR75. A catch of fish taken from the Murray River near Morgan South Australia c1910 recording the presence of the four principal native fish species of the Lower Murray. Visible are quite a number of Murray cod and Silver perch (forked tails), one Catfish (tail visible above and to the left of the second man from left) and probably a couple of Golden perch (humped shoulders & rounded tails). Individuals in the photo (based on inscriptions on the rear) are Alf Glach, a Mr Karde and a Mr Lovelaw. The title was 'Fishing ELDDLOM'. Photo courtesy of Shane Strudwick, *Discover Murray.*

Photograph 21.5 They Call the Trout Cod the Rock Cod


135) Evidence taken from fishermen, May–June 1935, seems to indicate that few less "Cod" are caught since locks were put in. F/men say cod are still there at least above Blanchetown, but that extension of lagoons has given permanent grass for breeding of goldfish, yabbies, shrimps, all food of the cod. Thus supplies of food in main chan are increased and cod are always fat & rarely take a bait.

Fishermen all still insist that there are 2 species of cod. They call the "Trout cod" the Rock cod from No. 6 lock down.

Trevor Scott recorded these annotations on the cod fishery in South Australia in a copy of Edgar Waite's book *Fishes of South Australia.* Included are the observations of fishermen on the presence of Trout cod downstream of Lock 6 in 1935. Image courtesy of Michael Hammer.

Photograph 21.6 Purnong Trout Cod

This juvenile Trout cod was collected from the Murray River at Purnong in 1932 and is preserved in the collection of the South Australian Museum. Photo courtesy of Michael Hammer.

Photograph 21.7 Lower Murray Macquarie Perch

This Macquarie perch was obtained from Daws Fish Market by a staff member of the South Australian Museum in 1917 and subsequently preserved in the museum's collection. It, along with a second specimen obtained the following year, provides physical proof of the species' former presence in the lower Murray though their original abundance remains unclear. Photo courtesy of Michael Hammer.

21.3 The Changes

21.3.1 Changes to Native Fish Distribution and Abundance

In Lake Victoria cod were abundant early in the twentieth century (Stead, 1903; *Argus,* 27 February 1932), but by 1949 a three month survey using drum nets and longlines with 1000 hooks captured only seven Murray cod and a few Golden and Silver perch (Cadwallader, 1977). Good numbers of cod and the two types of perch were taken in the Murray River near Locks 7-9, Golden perch were still common in the Rufus River and Frenchmans Creek, and the Lindsay River and Wallpolla Creek held good numbers of Murray cod and Golden perch, as well as small numbers of Silver perch. By 1949, Macquarie perch and Blackfish were absent from the upper zone, and local fishermen reported that Trout cod had not been caught for 50 years (Cadwallader, 1977). Anecdotes from commercial fishermen indicate that Trout cod and Macquarie perch were taken regularly in specific sections of the river into the 1930s, but had disappeared by the 1950s. Catfish were common in the Lake Victoria area in 1949 (Cadwallader, 1977). In Frenchmans Creek Catfish remained very abundant up to the 1960s but declined after the arrival of European carp (Lever, OH 77).

In the middle zone at Lake Bonney, regulation of the water supply via Chambers Creek in 1922 was identified as ruining it as a cod nursery (*Adelaide Advertiser,* 12 December 1935). In 1950 a large cod killed by a yacht was reported to be the first seen for twenty years (*Burra Record,* 2 May 1950). Near Morgan up to 1894, the catch of cod was about half a tonne a week on cross lines and springers alone. In 1897 164 tonnes was captured, with most of the catch being taken from July to November, corresponding with the spawning season. By 1900 some decline was becoming evident in the catch (Dannevig, 1903). A substantial decline in the cod fishery had occurred by the 1920s, and this was linked to overfishing and the construction of locks (*Adelaide Advertiser,* 4 July 1929). Scott suggested that Trout cod may have persisted in South Australia into the 1970s (Scott *et al.,* 1974) though commercial fishermen have suggested to the author they were absent in the upper zone by the 1950s. The last accounts from the middle zone are Scott's record of fishermen reporting them in 1935 downstream of Lock 6 (Hammer *et al.,* 2007).

By the 1950s, while substantial declines had occurred in native fish populations in Lakes Victoria and Bonney, and some species had disappeared from the Murray, a large fishery for Murray cod, Golden perch, Silver perch and Catfish still existed in the river. Commercial data indicates that a further decline occurred in the cod catch from a peak of 140 tonnes in the late 1950s, to less than 10 tonnes by 1975. This was being linked to river regulation (Hammer *et al.,* 2007). Catfish were common up to the 1960s, with a decline in commercial catches from about 20 tonnes in 1969 to negligible quantities by 1982. This decline was linked to the arrival of European carp, however the fish was in decline prior to their arrival (Hammer *et al.,* 2007). Blackfish have not been reported from the Murray River in South Australia for at least 50 years. Relic populations only remain in the Mt Lofty zone; eels are very rare and Congolli, while still present in the lower lakes, have not been recently reported in the river upstream (Hammer *et al.,* 2007).

21.3.2 Changes to Habitat

Natural fish kills were a regular occurrence in the early years. In 1857 'cartloads' of Murray cod died during saline conditions near Milang in Lake Alexandrina (*Adelaide Advertiser,* 4 May 1892, 8 July 1892) and this was apparently a fairly regular occurrence (Zeitz, 1902). Large numbers of fish died in Lakes Bonney and Victoria in 1903, and this was attributed to stagnant conditions associated with drought (*Adelaide Advertiser,* 27 March 1903). Fish populations were again lost in severe drought in 1915 (*Adelaide Advertiser,* 25 June 1915). In 1908 large fish kills occurred in the Coorong Lakes, attributed to 'marsh gas' (*Adelaide Advertiser,* 12 December 1908). In 1912 many fish were killed by birds in drying lagoons along the Murray (*Adelaide Advertiser,* 11

September 1912). Nearly 45,000 Bony Herring died in a mile of the river near Nildottie in 1929, and this was associated with a 'freshet' entering stagnant water (*Adelaide Advertiser,* 23 August 1938).

By the 1880s concern was expressed for the future of the fishery due to overfishing, and in 1882 it was recommended that a closed season be introduced (*South Australian Register,* 31 August 1882). This did not take place in South Australia until 1900 (*Adelaide Advertiser*, 23 September 1903). Commercial fishermen targeted cod migrating out of the river into anabranches to spawn, in some cases completely blocking their passage (*Adelaide Advertiser,* 5 December 1929). As late as 1946 it was reported that three tonnes of fish a week were being taken between Wentworth and the South Australian Border (*Adelaide Advertiser,* 26 September 1946). There was also extensive use of wire fish traps by farmers who also took large numbers of fish (*Adelaide Advertiser,* 11 September 1912). In the Lake Victoria area in 1949, illegal wire fish traps were reported as being 'too numerous to count' (Cadwallader, 1977). The activities of commercial fishermen impacted not only on the fish but on other aquatic fauna. One fisherman in South Australia reported that in the course of four months 3,000 turtles had been killed in drum nets (*Adelaide Advertiser,* 10 July 1902). License fees were used to fund an extensive program destroying large numbers of cormorants and turtles to enhance the fishery (*Adelaide Advertiser,* 14 August 1905).

Snags in the form of submerged trees, as well as rock and sand bars provided obstacles for the riverboat traffic. The first purpose built snagging boat, the *Grappler,* was launched in 1858 and while owned and operated by the South Australian government, the *Grappler* actually spent much of its early working life in NSW. While snag removal did occur in South Australia, the river being wide and deep meant that they were much less of an obstruction to traffic than the rock bars. It appears that snagging was less extensive than upstream in NSW (Victorian Government, 1867; Mudie, 1961). The construction of canals bypassing these obstacles was advocated, and while this never eventuated, the formation of the River Murray Commission (by agreement between the states and the commonwealth) led to the construction of the locks. These locks were initially conceived to improve boat passage, but later provided irrigation diversions and flood control (*South Australian Register,* 2 May 1883, 7 March 1889; Eaton, 1945).

The construction of locks along the river has been linked to a decline in fish populations in a number of ways. In 1928 earthworks constructed along Frenchmans Creek and Lake Victoria, combined with a regulator on the Rufus River and the influence of Lock 9, stabilised water levels in the lake and was identified as responsible for a severe decline in the cod population (Cadwallader, 1977; *Adelaide Advertiser,* 4 July 1929). Locks 7, 8 and 9 almost totally regulated river levels, and their operation was associated with sudden changes in level (Cadwallader, 1977). Golden perch tagged in the Murray River near Berri in South Australia have moved as far upstream as the Menindee Lakes and the Edward River, and the locks have been identified as potentially inhibiting these migrations (Reynolds, 1983). Sometimes at the base of the locks hundreds of native fish were killed by passing over the structure. Upstream migrations of cod were blocked, and the congregated fish were targeted by cormorants and pelicans. The locks also permanently flooded large areas of river anabranches, another factor suggested as adversely affecting native fish recruitment (*Adelaide Advertiser,* 24 June 1932). Commercial fishermen linked the disappearance of Trout cod and Macquarie perch upstream of Renmark to the inundation of the faster and rocky sections of the river which was their preferred habitat. The disappearance of Congolli and Lampreys has also been linked to the barriers and reduced flows, with regulation resulting in a two thirds reduction in the flow of the river (Hammer *et al.,* 2007). The construction of the barrages at Lake Alexandrina was blamed for the death of fish in the lakes, as during periods of low flow the water became extremely saline (*Adelaide Advertiser,* 24 June 1932). The barrages have also been linked to the disappearance of Estuary perch and eels upstream (Hammer *et al.,* 2007).

From late 1929 to the early 1930s repeated large fish kills were reported along the Murray River in South Australia. At the time they were attributed to saline conditions or the management of locks (*Adelaide Advertiser,* 26 October 1929, 5 December 1929, 30 July 1930). It is was reported that it was 'usual' for fish to die in backwaters along the Murray due to the water becoming 'saline', but in October 1929 dead fish, including cod in quantities not previously recalled by fishermen, were observed upstream of Lock 6 to below Lock 4. It was suggested that inundation of weed and bark in billabongs was responsible (*Adelaide Advertiser,* 26 October 1929). Later that year near Blanchetown, cod up to 140 lb. (63.6 kg) and many Bony Herring died, though it was suggested that small cod were less affected. It was concluded that 'slime' in the river was responsible (*Adelaide Advertiser,* 5 December 1929). In July 1930 thousands of Murray cod, together with Golden perch and Silver perch, were reported to have died along the length of the Murray in South Australia. The deaths were attributed to either being as a result of a salinity problem in the river, or because of poor water at the bottom of the locks being released downstream (*Adelaide Advertiser,* 30 July 1930). The sequence and timing of some of these kills correlates well with the release of water treated with copper sulphate from the Hume Weir in mid 1929 (Cadwallader, 1977; *Argus,* 20 November 1929) and late 1929 - early 1930 (*Sydney Morning Herald,* 2 April 1930). Ongoing treatments of the Hume Weir with copper sulphate up to 1934 may be linked to subsequent kills (*Adelaide Advertiser,* 24 June 1932).

In 1931 the protozoan parasite *Ichthyophthirius* was first detected in aquarium fish in South Australia, with concern expressed about its potential impact on native fish (*Adelaide Advertiser,* 30 December 1931). It had been absent in Australia but an epidemic spread through aquarium fish across the nation in 1932 and subsequently killed fish in trout hatcheries (*Hobart Mercury,* 8 December 1932, 14 March 1933). It was prevalent in South Australia by 1933 (*West Australian,* 21 June 1933). In July 1938 a large fish kill occurred near Mannum which was unexplained (*Adelaide Advertiser,* 23 August 1938).

'Carp' (Goldfish) were established in the Torrens River by 1868 from which they were translocated to Valley Lake near Mount Gambier (*South Australian Register,* 13 June 1868, 7 November 1868). They were present in the Murray River by the 1890s and underwent a rapid proliferation around 1907, with concern expressed about their potential impact (*Adelaide Register*, 18 May 1907). Redfin perch were introduced to the Onkaparinga River near Adelaide in 1877 (*South Australian Register,* 12 July 1877) and near Mount Gambier in 1882 (*South Australian Register,* 23 September 1882, 24 January 1885; *Adelaide Advertiser,* 17 May 1935). During the 1950s their spread was encouraged in South Australia (*Adelaide Advertiser,* 19 May 1950, 21 May 1953). Redfin perch were present in the lower Murray by 1886 (*South Australian Register,* 10 September 1886) and by 1935 they were abundant in parts of the lower Murray with their introduction being associated with the disappearance of small cod (*Argus,* 28 March 1935), 'chequered gudgeon' (*Adelaide Advertiser,* 1 December 1932) crustaceans (*Adelaide Advertiser,* 18 August 1936) and Congolli, gudgeon and minnows (*Adelaide Advertiser,* 22 August 1936). Brown trout were regularly liberated into streams entering the Murray from the Mt Lofty area after 1914 (*Adelaide Advertiser,* 27 August 1937). An attempt was made to introduce Eastern gambusia to South Australia to control mosquitoes in 1923 (*Adelaide Advertiser,* 13 October 1934), with the fish being reported to have been acclimatised during the 1930s (*Adelaide Advertiser,* 1 October 1937). In 1933 proposals were made to introduce them throughout South Australia to control mosquitoes (*Adelaide Advertiser,* 15 December 1933) and they were extensively distributed (*Burra Record,* 3 December 1940). They are now widespread in the Lower Murray and considered to have played a role in the decline of native fish, particularly the smaller species (Hammer *et al.,* 2007).

'Russian carp' were released into Valley Lake at Mount Gambier in 1882 (*South Australian Register,* 19 November 1884) though it is unclear whether they were Goldfish or European carp. Lake (1959) reported European carp to be widespread but scarce in NSW during the 1950s, and they may have had a minor presence in the Lower Murray by that time. In the mid 1960s the Boolarra Strain was introduced to Lake Hawthorne

near Mildura and entered the Murray River where they proliferated (Koehn *et al.,* 2000). European carp were first detected in commercial catches in South Australia in 1969, and the catch reached a peak in 1976 when 250 tonnes was sold (Hammer *et al.,* 2007). An exclusion experiment in a billabong in South Australia demonstrated that when European carp were present the turbidity of the water increased substantially (Jensen, 2005). Their arrival was linked to a decline in Catfish abundance in some waters (Clunie & Koehn, 2001a; 2001b; Lever, OH 77). The creation of static waters behind locks and general degradation of the aquatic habitat has probably favoured the proliferation of carp (Gerkhe *et al.,* 2002).

21.4 The Current Situation

The *Sustainable Rivers Audit* concluded that 'The Lower Murray Valley fish community was in Poor Condition. The community had lost much of its native species richness. / Fish abundance was dominated by native species in all zones, but biomass was dominated by alien species, and most expected species were absent'. Thirteen predicted species that require access to the estuary were missing due to the barrier effect of the barrages (Davies *et al.,* 2008). Trout cod and Macquarie perch are now extinct in the Lower Murray and Blackfish are rare. The Murray cod population has continued to decline and recently a ban on the taking of cod in South Australia was implemented to conserve the species.

In 2001 the Murray-Darling Basin Commission initiated the *Sea to Hume Dam Fishway Program* with the goal of restoring continuity of fish passage upstream over man-made barriers including locks and weirs from the Hume Dam downstream to the Murray River mouth. Katfish Reach encompassing part of the floodplain, and wetlands between Berri and Loxton, are now 'demonstration reaches' for the Murray-Darling Basin Authority's *Native Fish Strategy.* At these sites a range of rehabilitation activities will be conducted with community participation to improve habitat and restore native fish populations.

21.5 Newspaper Highlights

Adelaide Observer, 25 November 1865

Murray Fish and Adelaide Meat. / There are many kinds of excellent fish in Lake Alexandrina. There is, first, the magnificent Murray cod, or "ponde". A steady, skilful fisherman, with proper appliances, could easily catch a ton a week at this place alone, and there are many other equally good fishing places. Next there is "pomerey" – a very delicious fish. I have never yet heard of their being taken to Adelaide; they are the nicest fish I have ever eaten in this colony. 3rd. The "tarke" is a fish weighing about 5 lb. It is excellent eating, and salts well. / "Tukkere." These are excessively bony fish, very beautiful in appearance, but full of bones. The blacks are very fond of them, and I know they have a very good flavour.

Adelaide Register, 20 May 1892

Murray Fish and their Habits (From our own correspondent) Blanchetown, May 15.

The Murray cod may be caught from one – quarter of an inch in length to over 100 lb. in weight. / A young German, an assistant at a wool washing establishment about five miles from here, was in a habit of bathing off the stage, and one day while having his usual dip sat on the stage with his feet swaying to and fro in the water, when a cod seized his foot, at the same time nearly forcing him off the stage into the water, the German having his foot severely scarred by the teeth of the cod. Some time elapsed before he recovered. At Weston's Flat, a short distance above Morgan, the residents were in the habit of swimming their stock across the river for feed, and while swimming one of the horses it turned on one side, and with difficulty the boatman towed it to the shore, and with aid of blocks and tackle hauled him onto dry land, when, to their surprise, a huge cod had the horse's foot in his mouth. The cod was captured, and weighed over 90 lb. Without doubt in some of the numerous cases of drowning, where good swimmers have disappeared, they have had a tussle with one of these "monsters of the deep."

/ The next to the cod, and by many people preferred before the cod, is the callop or Murray perch, which in my opinion is superior, and really deserves a better place in the Adelaide markets / Perch are in great abundance in these parts of the Murray, and prefer from four to eight feet of water, and are caught almost solely by nets. The smaller ones – about half a pound in weight – may be caught by hook, but the large ones very rarely. The smallest perch I have noticed would be about 1 ½ in. in length, and I have caught them up to 8 lb. weight; but like the large weights in cod this is of very rare occurrence, the average weight being about 2 lb..

/ The rock cod are very rarely caught about here. The largest I have caught would be about 8 lb. and the smallest about 1 lb. Although they resemble the cod in many ways the formation of their bodies is different. They have a much larger eye than the cod, thus indicating that it is at night when they obtain their food. The catfish are caught, but like the rock cod, are not very abundant. They are also very good eating, some people being fond of them; but owing to their ugliness they are not very saleable. I have caught them up to about 7 lb. or 8 lb., the smallest about 2 ½ in. in length.

The Murray bream is a smaller fish, the largest I have caught being about 5 lb. and the smallest about 2 in. in length. The bream chooses rapid creeks or where a rapid current comes over a bank, and where there are plenty of water weeds growing on the bottom. The Murray bream, I think, is the sweetest eating of all the Murray fish, especially the larger ones. At times it can be caught in great quantities, chiefly by rod and line, as they are very cunning fish.

Adelaide Advertiser, 10 July 1896

Murray Fishery and Fishculture. The River Murray is the most important watercourse in South Australia, yet it contains only two species of fish of marketable value. These, the Murray cod and Murray perch, or callop, command a ready sale, while the catfish, silver bream, and black bream in which the river abounds are not sufficiently palatable to be of commercial value.

Adelaide Register, 18 May 1907

Mr. S. McIntosh (Inspector of Fisheries) has furnished the following report to the Chief Inspector of Fisheries (Mr. T. Duffield) on the subject of English carp in the River Murray...I am not aware when the first consignment of "Golden carp" (Carrasius auratus) was liberated into inland waters. Ten years ago there was said to have been a few seen on the river flats near Murray Bridge. Seven years ago not more than four or five of the fishermen along the river claimed to be acquainted with them. Today they abound in myriads from, at least, Waikerie to the lakes' entrance... During the last year I have seen thousands of these fish about quarter – size brought in with the flood waters, required to "leach" the reclaimed swampland on the experimental station. In December last my son brought in over 40 of these fish, which he found stranded by the receding Murray Flood

Adelaide Advertiser, 12 December 1935

Murray Fishing Industry. Suggested Hatcheries Near Lake Bonney.

/ In 1914, when the lake reached its record low level, hundreds of tons of fish were taken by nets from the shallow pools, and sent to Melbourne and Adelaide for sale. Some of those fish weighed up to 50 lb. The largest fish ever caught in the Murray was one weighing 225 lb., which was caught between Kingston pumping plant and Cobdolga, near the mouth of Chambers Creek. In the opinion of old fishermen, this fish must have found its way out of Lake Bonney through the creek to the river. There have been more large fish caught in the vicinity of Cobdolga and Kingston than at any other part of the Murray.

Adelaide Advertiser, 13 December 1935

Record Murray Cod. / "This is the head of probably the largest cod ever taken in South Australian waters of the River Murray," the Director of the Adelaide Museum (Mr. H. M. Hale) told members of the S.A. Fish Protection and Anglers' Association at the annual meeting at the Exchange Hotel, Adelaide. Mr. Hale displayed the head of a Murray cod which made members gasp in astonishment. He estimated that the fish must have measured 6 to 8 feet long. The president of the association (Mr. E. G. Saunders) suggested that the fish would possibly have weighed 300 lb., and might have been over a hundred years old. Mr. Hale said that the head had been recently discovered at the Adelaide Museum. He could not trace any reference to it.

22 Wimmera & Avoca River Catchments

Active research into the history of fish populations in the Wimmera and Avoca River Catchments was not conducted in this project; however, some early news accounts describing native fish populations were located. A brief summary of the records located are presented.

22.1 Wimmera River

The earliest newspaper accounts indicate that the largest native fish present in the Wimmera River were Blackfish and eels. In 1864 a flood was reported to have 'destroyed large numbers of blackfish' in the Wimmera River near Ararat (*Argus,* 7 July 1864) and eels and Blackfish were mentioned as present in the river in another article (*Argus,* 4 July 1879). Another account also reports the presence of eels, Blackfish and a small 'native trout' (galaxiids) and a small perch which were probably Pigmy perch:

> Some very large eels, caught in Lake Boloke, where they abound were taken into Ararat for sale a few days ago. Two of them, which were in vigorous condition, and over six feet in length, were placed in the municipal water-dam, where possibly they may breed. In some places along the Wimmera the subsidence of the late flood has left scores of blackfish and trout high and dry upon the banks. Amongst these was observed a fish somewhat smaller than the blackfish, though larger than the native trout, which appeared to possess, to the minutest degree, all the characteristics of English perch (*Argus,* 3 October 1867).

In the Mt. William Creek, at Ledcourt, a fish kill occurred, which included large numbers of Blackfish (*Argus,* 21 February 1874). By 1911 it was reported that Blackfish were 'disappearing fast' from the Wimmera River (*Argus,* 15 September 1911).

Cod were introduced to the upper reaches of the Wimmera River near Crowlands in 1861, being sourced from the upper Loddon River (*Argus,* 26 March 1861). After their introduction, few cod were seen for over a decade but in 1870 small cod appeared and were reported to be 'numerous' in the river (*Argus,* 6 June 1866, 14 April 1873). In 1909-10 hundreds of Macquarie perch were released by the Fisheries and Game Department into the upper Wimmera River and in 1910 400 'Murray perch', obtained from the Goulburn Weir, were liberated by local anglers. By that time cod and other Murray River species had a significant presence in the upper reaches near Ararat (*Argus,* 15 September 1911; Cadwallader, 1981). Between 1913 and 1950 large numbers of Macquarie perch were translocated from the Goulburn Weir and Broken River to the Wimmera River (Cadwallader, 1981). In 1933 cod and Golden perch were translocated from the Wakool River to Taylors Lake (NSW Fisheries Report, 1933; Cadwallader, 1981) and a number of translocations of cod from the Gunbower area to Taylors Lake occurred during the mid 1930's (Cadwallader & Gooley, 1984).

In 1950 Langtry recorded Golden perch being present in Lake Hindmarsh and that self-supporting populations of Golden perch and cod existed near Jeparit. Blackfish and Catfish were absent, and Macquarie perch rare in that area. He also highlighted Taylors Lake as one of two impoundments supporting reproducing cod populations (Cadwallader, 1977).

Redfin perch were introduced to Wimmera River in the 1880s (Clements, 1988) and by the early twentieth century were abundant. Near Jeparit a party of 20 anglers on one occasion took 1068 fish for a total of three and a half hundred weight (*Argus,* 28 September 1911). The Wimmera River was used to restock Lake Wendouree with Redfin perch after the population in that water was lost due to drought. Included in the

shipment were small numbers of 'Murray bream' up to 5 lb. (2.3 kg) in weight containing 'spawn' (*Western Mail,* 26 November 1915).

22.2 Avoca River

The earliest newspaper account records that at the time of European settlement the largest fish were Blackfish (*Argus,* 26 February 1873) though it is likely that eels were also present. In the 1860s the Avoca River was considered one of the best Blackfish streams in northern Victoria (*Argus,* 22 January 1915).

In March 1870 '500 Murray cod and trout' were captured by the Murray River Fishing Company near Echuca and transported to the Avoca Acclimatisation Society for release into the Avoca River (*Riverine Herald,* 9 March 1870) indicating that both Murray cod and Trout cod were released. A later account reported that other species were translocated stating that 'cod, perch and bream fry' had been released (*Argus,* 14 April 1873). By 1873 small cod were being taken near Avoca and a Golden perch was taken at Natte Yallock in 1873 (*Argus,* 26 February 1873). Later translocations included nearly 400 Macquarie perch from the Goulburn Weir to the Avoca River in 1927 (Cadwallader, 1981).

Around the time of the initial translocation activity, the Great Flood of 1870 occurred. A newspaper account recorded the arrival of large numbers of 'bream' in the Avoca River which had gained access via Lake Boga:

> Simultaneously with the supply of young fish introduced from the Murray to the Avoca River by the local Acclimatisation Society (says the *Mail*), a very remarkable introduction of young bream to the river has taken place. The fish are apparently the genuine Murray bream, and have found their way, most probably, from Lake Boga, during the last winter floods. At Natte Yallock the young fish, about three inches long, are so plentiful that anglers for blackfish are constantly hooking young bream in unorthodox fashion, that is by the hooks when drawn up attaching themselves to their backs or fins (*Argus,* 20 April 1870).

The newspaper evidence indicates that, apart from Blackfish, the larger fish species were absent from the Avoca Catchment at European settlement. The appearance of the 'bream' in 1870 after major flooding indicates that larger species under certain conditions did gain access to and were at least temporarily present in this catchment.

In the 1890s a worm parasite was reported for the first time in the flesh of Blackfish in the Avoca River, and concurrently was also reported in Blackfish at other locations including the Tarwin River and Koo-wee-rup Swamp. A newspaper account suggested that the worm was not endemic to the Avoca Catchment but introduced and speculated that the deterioration of the habitat promoted its occurrence (*Argus,* 22 January 1911). In 1938 a large kill of cod occurred in the Avoca River near Glenloth with the fish ranging from 2 to 80 lb. (0.9 to 36.4 kg) (*Argus,* 2 February 1938). Redfin perch were introduced to the catchment in the 1880s (Clements, 1988) and by 1900 were abundant in the Avoca River (*Argus,* 23 January 1900).

Species Summaries

23 Analysis and Summary of Historical Information on Native Fish

During the course of this project a large amount of historical information was collected on the native fish of the Murray-Darling Basin. Most of this has been reviewed on a catchment by catchment basis in the previous sections. The primary aim of the project was to collect historical information and identify the original distribution and habitat preferences of Trout cod and, secondarily, the other large native fish species within the southern half of the Basin. This section provides an analysis and summary of all the information collected.

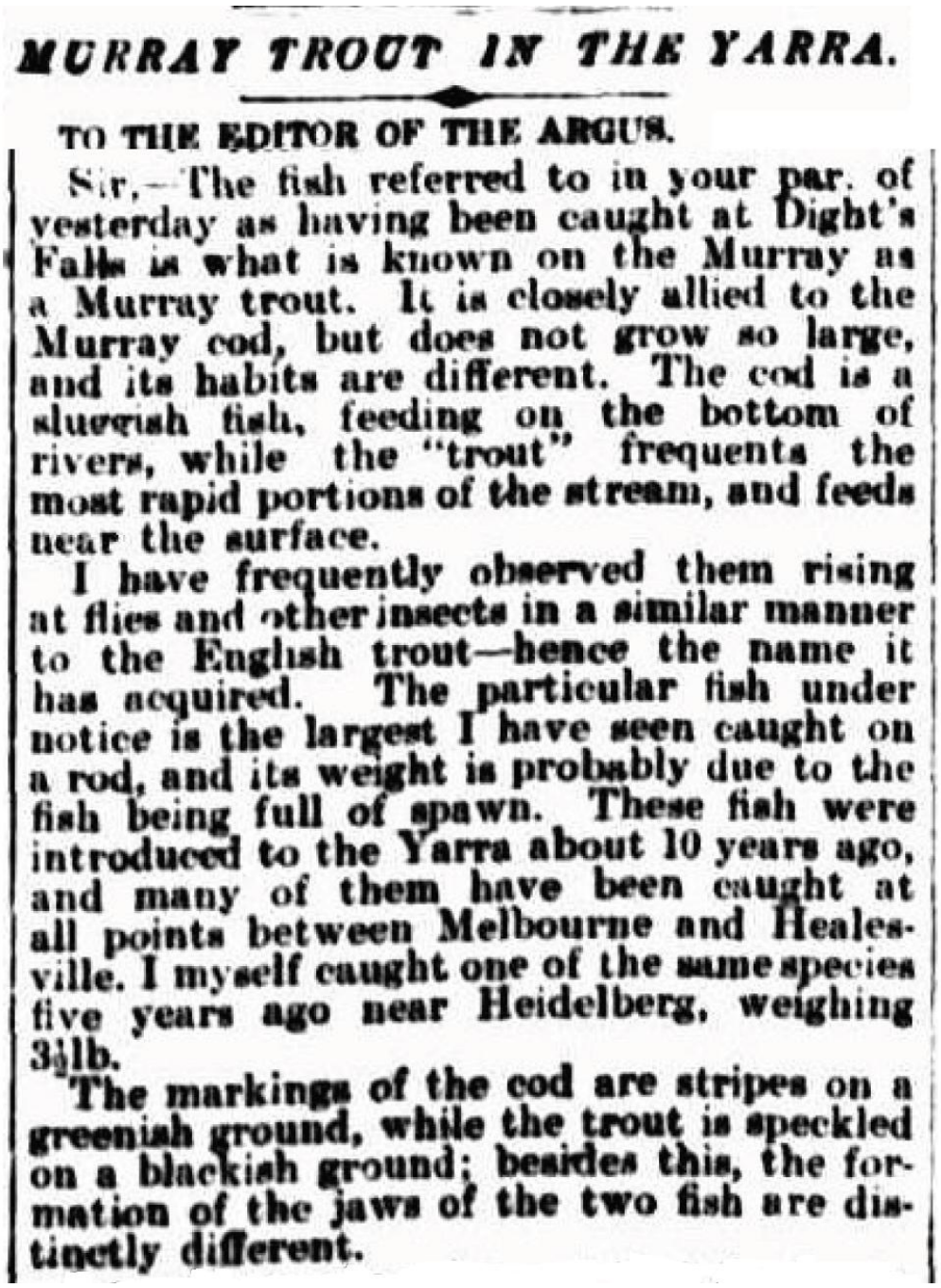
The summary is presented on an individual species basis and for each the information is discussed under the following headings:

1. European Discovery: A description of the earliest European encounters with each species;
2. Aboriginal Names: A collation of names reported for each species in the writings of early Europeans attributed to aboriginal people. The list is certain to be very limited in scope as until comparatively recently few publications documented aboriginal language;
3. European Names: Briefly outlined is a history of the changes and synonyms of the scientific names used for each species, followed by the common names in general use from the past up to the present. In an earlier section a lengthy review was presented, covering the history of the taxonomic argument over Trout cod that continued for nearly 150 years. While previously discussed, a brief summary of the key changes in the scientific name of the Trout cod along with the basic reasons for these changes, has been provided;
4. Distribution and Habitat: All of the collected information on distribution and habitat associations is evaluated to highlight general trends and provide an overall description for each species. To aid in the analysis, the rarity scores assigned to each habitat zone, as defined previously in the summaries for each catchment, were averaged on a state and basin wide basis (in the area investigated in this project). Records originating from the Australian Capital Territory were included in determining the scores for NSW. Where the author assigned an upper or lower value to a rarity score the value was increased or decreased by 0.5 to improve the accuracy of the analysis; e.g., a L3 = 2.5 while a U3 = 3.5. As the focus of the project was to resolve the debate over the original distribution and habitat associations of Trout cod, there is a discussion on the differing views on the species former distribution and a consideration of the strength of the historical data which leads to a conclusion on this issue. For the other species there is a brief discussion, comparing the historical records reported in Lintermans (2007) to those recorded in this project to reach an overall conclusion on the range and habitat associations of each species;
5. Translocations: Historical accounts of translocations, that took place prior to the commencement of the stocking of hatchery produced fish in the 1970s, are summarised which may aid those undertaking research into the genetics of fish populations and help explain the presence of species in some waters;
6. Size: For each species information is provided on the maximum recorded size or weight which is known to be of interest to anglers;
7. In the case of Trout cod historical accounts relating to general aspects of its biology are presented. For the other species miscellaneous accounts or information identified in the historical material which to date have not been widely known are presented;
8. Community Value: A brief summary of the historical value of each species to the community including their popularity as angling and table fish and importance in commercial fisheries;
9. Current Status: The current conservation status of each species is stated, along with a brief summary of the major changes to distribution and abundance based on the historical evidence collected and recent angler reports;
10. A map using the information collected during this project presents the likely former historical distribution and abundance in the southern Murray-Darling Basin of each species.

Table 23.1 Definitions of Rarity Scores used in the Project

Abundance	Rarity Score	Criteria
Absent	0	No credible account reporting the species former presence
Rare	1	A few individual fish could be expected to be taken by a resident angler each year
Common	3	Regularly taken by a resident angler in small numbers: a typical expected catch would be less than 5 fish per day. The species may have been patchily distributed preferring specific reaches or habitats
Abundant	5	Frequently taken by a resident angler in good numbers: a typical catch would exceed 5 fish per day. Generally found along the length of the main channel though may have exhibited some local variations in abundance.

23.1 Trout Cod, *Maccullochella macquariensis*



MURRAY TROUT IN THE YARRA.

TO THE EDITOR OF THE ARGUS.

Sir,—The fish referred to in your par. of yesterday as having been caught at Dight's Falls is what is known on the Murray as a Murray trout. It is closely allied to the Murray cod, but does not grow so large, and its habits are different. The cod is a sluggish fish, feeding on the bottom of rivers, while the "trout" frequents the most rapid portions of the stream, and feeds near the surface.

I have frequently observed them rising at flies and other insects in a similar manner to the English trout—hence the name it has acquired. The particular fish under notice is the largest I have seen caught on a rod, and its weight is probably due to the fish being full of spawn. These fish were introduced to the Yarra about 10 years ago, and many of them have been caught at all points between Melbourne and Healesville. I myself caught one of the same species five years ago near Heidelberg, weighing 3½lb.

The markings of the cod are stripes on a greenish ground, while the trout is speckled on a blackish ground; besides this, the formation of the jaws of the two fish are distinctly different.

Argus, 8 September 1898

MURRAY TROUT IN THE YARRA

TO THE EDITOR OF THE ARGUS.

Sir, - The fish referred to in your par. of yesterday as having been caught at Dight's Falls is what is known on the Murray as a Murray trout. It is closely allied to the Murray cod, but does not grow so large, and its habits are different. The cod is a sluggish fish, feeding on the bottom of rivers, while the "trout" frequents the most rapid portions of the stream, and feeds near the surface.

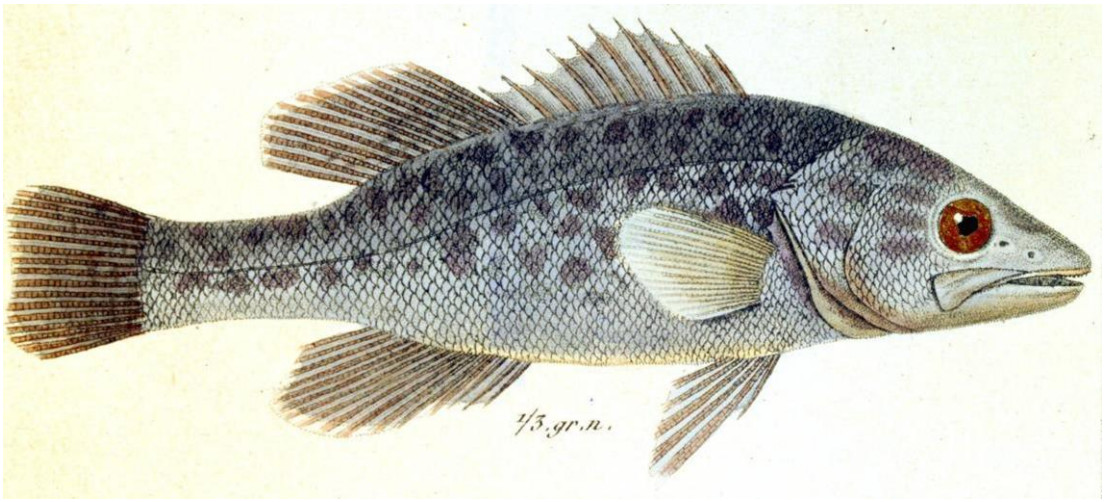
I have frequently observed them rising at flies and other insects in a similar manner to the English trout – hence the name it has acquired. The particular fish under notice is the largest I have seen caught on a rod, and its weight is probably due to the fish being full of spawn. These fish were introduced to the Yarra about 10 years ago, and many of them have been caught at all points between Melbourne and Healesville. I myself caught one of the same species five years ago near Heidleberg, weighing 3 1/2lb.

The markings of the cod are stripes on a greenish ground, while the trout is speckled on a blackish ground; besides this, the formation of the jaws of the two fish are distinctively different.

23.1.1 European Discovery

The first European encounter with cod was by George Evans in November 1813 who recorded what he described as 'trout' from the Fish River, near the present site of Tarana (Mackaness, 1965). The description provided by Evans, combined with other subsequent accounts, leaves no doubt that the fish were cod. The oral history of the Macquarie catchment suggests that Trout cod were the prevalent cod species in the upper Macquarie. It is therefore likely that Evans' catch included Trout cod and was probably the first European encounter with the species. The first unambiguous account of Trout cod was that of Lesson (Lesson, 1825) who captured them from the Macquarie River at Bathurst in February 1824, preserving a specimen that still exists. This specimen was later described and illustrated (Lesson, 1825, 1830; Cuvier & Valenciennes, 1829; Guérin-Méneville, 1829, 1838).

Photograph 23.1 The First Trout Cod



Artist Felix Guérin-Méneville created this illustration of the holotype for Trout cod collected by Rene Lesson from the Macquarie River at Bathurst in February 1824 and named by Georges Cuvier as *Gristes macquariensis.* It was published in *Iconographie de regne animal de G. Cuvier, Vol 1,* in 1836. Reprinted with permission from the Rare Books Collection, *State Library of Victoria*.

23.1.2 Aboriginal Names

European accounts record a number of aboriginal names for Trout cod. Blandowski (1858) reported the name 'Yaturr' as being used by the Yarree Yarree (Jari Jari) people of the lower Murray in Victoria. 'Ngumel' was the term used for Trout cod in the Wemba Wemba language of the Swan Hill region (Hercus, 1992; *Argus*, April 5, 1910) and Trout cod were known as 'Bangami' in the Yorta Yorta language of the Barmah region (Bowe & Morey, 1999). A newspaper account records that 'Inna' was a name for cod used by the Omeo aborigines (*Argus*, May 23, 1860) with earlier accounts suggesting that the term was pronounced as 'Inme' or 'Inni' (Clark, 2000). Historical evidence suggests that the majority of cod in the Omeo area were Trout cod. Very specific names were used for each type of fish reportedly ending in 'munjie' (*Argus*, May 23, 1860; Clark, 1998, 2000) with 'munjie' possibly added by aborigines in their communication with Europeans to emphasise the type of

animal they were discussing (Barry Blake, pers. com.), eg, Inna munjie = 'Trout cod, fish'. It is likely that 'Inme' or 'Inna' was the term for Trout cod in the Yaithmathang (Gundungerre) language of the Omeo region. Matthews (1909) recorded 'Yumboa' as the term for cod in the language of the Dhudhuroa along the upper Murray River, and the Kiewa and lower Mitta Mitta Rivers. In all three water ways Trout cod were prevalent and 'Yumboa' (pronounced 'Yambuwa') may have referred to the species. Bennet (1834) recorded two aboriginal words for cod in the Yass and Tumut areas (possibly the Ngunawal aboriginies), namely 'Mewuruk' and 'Bewuck' and while Bennet's description suggests that the former applied to Murray cod, there is insufficient evidence to conclude as to which species was referred to as 'Bewuck'.

23.1.3 European Names

A detailed history of the taxonomic name changes for Trout cod was provided earlier in a previous section. Summarising that history, the following key events took place. In 1825 Lesson published an account of his capture of a new species of fish from the Macquarie River at Bathurst naming it *Gryptes brisbanii* but not providing a description (Lesson, 1825). It was probably his intention to name the species *Grystes brisbanii* based on advice from Cuvier but a typological error either on his part or that of the publisher resulted in the misspelling of the name of the genus. In 1829 Cuvier and Valenciennes published a detailed description of a specimen collected by Lesson naming the species *Grystes macquariensis* (Cuvier & Valenciennes, 1829). The following year Lesson published his description of the species and corrected the spelling naming the species *Grystes brisbanii* (Lesson, 1830). The illustration and holotype specimen demonstrates that *brisbanii/macquariensis* was a Trout cod.

In 1839 Mitchell published a description of a second species of cod which he captured from the Peel River in January 1832. He stated that they differed from the species described by the French due to the lack of white fin margins but also in a number of other unidentified features. He named it the new *Gristes peelii* (Mitchell, 1838). Mitchell's specimen has not survived but his illustration indicates that *peelii* was a Murray cod. In 1845 Richardson examined specimens of Murray cod exhibiting white fin margins which contradicted Mitchell's description and concluded that there was only a single species of cod, *Grystes macquariensis* (Richardson, 1845).

In 1859 Gunther separated the American and Australian species of *Grystes* and erected the genus *Oligorus* for the Australian species. Gunther possessed specimens of Trout cod (Gunther, 1880) but followed Richardson in recognising a single species *Oligorus macquariensis* (Gunther, 1859). In 1873 Castelnau published a detailed description of a new cod species which he distinguished from Murray cod by the possession of a longer upper jaw and other features, demonstrating it to be Trout cod. Unaware that the original description for *macquariensis* included a longer upper jaw, Castelnau named his new species *Oligorus mitchelli* (Castelnau, 1873). Ogilby, largely based on the examination of five cod museum specimens, concluded that only one species of cod existed namely *macquariensis* and rejected Castelnau's new species (Ogilby, 1893).

In 1929 Whitley recognised that the genus *Oligorus* was preoccupied by a beetle and erected the genus *Maccullochella* for Murray cod. A detailed examination of museum specimens led Whitley to the conclusion that only a single species of cod existed *Maccullochella macquariensis* (Whitley, 1937). The contention of a number of people including Stead, Tubb, Langtry, Roughley, Lake and Butcher that a second cod species existed, initiated a project in 1969 to resolve the issue. The result was that clear evidence was produced for the existence of two cod species with Trout cod being named *Maccullochella macquariensis* based on the specimen collected by Lesson in 1824 (Berra & Weatherly, 1972).

The earliest accounts of cod in the Bathurst area referred to the fish as 'trout' and 'rock cod' (Mackaness, 1965; Cunningham, 1816). These names were probably applied to both cod species, with both of these terms ultimately being widely used as common names for Trout cod. The term 'trout' or 'Murray trout' was associated with Trout cod in the Barmah area from at least 1859 (*Argus,* 13 August 1859) and was in use from the Deniliquin area to as far south as the Coliban River near Kyneton (*Argus,* 17 March 1911; NSW Fisheries Report, 1914; *Argus,* 17 March 1911). A newspaper account links the term 'rock cod' to Trout cod in South Australia as early as 1892 (*Adelaide Register*, 20 May 1892), with Stead (1929b) later recording that it was widely used for the species, particularly along the lower Murray. This name was the term most frequently encountered over a wide area for the species by the author during the collection of oral history in this project. In north east Victoria, and as far west as Swan Hill, Trout cod were often referred to as 'bluenose' with the term probably in use by 1908 (Rhodes, 1999; Trueman & Luker, 1992). It does not appear to have been widely used north of the Murray River. The name 'Trout cod' was created by Stead in 1909 (*Sydney Morning Herald,* 23 November 1909) but appears only to have gained widespread use amongst anglers after the Second World War.

23.1.4 Distribution and Habitat

Two contrasting views have been expressed on the former distribution of Trout cod. The first was proposed by Lake who suggested that the species was 'restricted to the cooler upper reaches of the Murray River and its southern tributaries' (Lake, 1971). He probably reached that conclusion based on: the fact that he collected most of his specimens near Tintaldra and Brimin (Bryan Pratt & Vick Pay, pers. com.); his observations of adult Trout cod dying when handled at higher temperatures (Lake, 1967a); Langtry's observations (Cadwallader, 1977); and information provided to him by fishermen. A similar conclusion was reached by Cadwallader and Gooley (1984) who created a map on the former distribution of Trout cod in Victoria, largely from oral accounts of anglers, which recorded a concentration of reports of Trout cod in north eastern Victoria located in slopes and upland habitats. They were also probably influenced in reaching this conclusion by the habitat occupied by the single remaining translocated population in Victoria located in the rocky upland gorge of the Seven Creeks near Strathbogie (Cadwallader, 1979).

The alternate view, expressed in the most recent National Recovery Plan (Trout Cod Recovery Team, 2008), is that Trout cod, while acknowledged as having been present in upland areas, is primarily a lowland species with its former centre of distribution being the Central Murray and Murrumbidgee Rivers. This conclusion was reached based on: the presence today of Trout cod in the Central Murray River and detailed studies of their ecology in that area; Langtry's record of their former prevalence between Yarrawonga and Barmah, and near Bringagee (Cadwallader, 1977); museum records; the perceived unreliability of angler accounts; the suggested unreliability of the Seven Creeks as an indicator of Trout cod habitat due to the translocated origin of the population; and unpublished data reporting juvenile Trout cod to exhibit a preference for high water temperatures (Douglas *et al.,* 1994; Brown *et al.,* 1998; Trout Cod Recovery Team, 2008). The primary aim of this project was to resolve the debate on the former distribution and habitat associations of Trout cod and what follows is an evaluation of the collected evidence.

The surviving museum specimens of Trout cod in Australia were identified by Berra and Weatherly (1972) and Berra (1974). The databases of museums list other specimens which no longer exist under the name of *Maccullochella macquariensis* and these records have been included in recently published maps identifying the past distribution of Trout cod (Lintermans, 2007). Most of these additional records of lost specimens were identified when the species name for Murray cod was *macquariensis* and subsequent formal identification has not taken place, making them unreliable. A small number of additional specimens of Trout cod have been

located by the author and held by institutions or in private ownership. The majority of the surviving confirmed specimens of Trout cod were collected by Stead and his associates from the Murrumbidgee River between Gundagai and Hay in NSW, around the time of the First World War (*Australian Museum* database). Some potentially significant museum specimens from other areas have been lost, notably four recorded as *Maccullochella macquariensis* collected near Cooma around 1906, two specimens from the Fish River in 1882, as well as others from the Macquarie, Broken and Riverina catchments (*Australian Museum* database).

Collectively, the confirmed specimens of Trout cod originated from as far upstream as Bredbo (altitude about 700 m ASL, privately owned) and downstream to Purnong (altitude about 25 m ASL, held by the *South Australian Museum*), with a scattering from intermediate locations covering all habitats from the lower montane zone to the lowlands. Specimens from the central Murrumbidgee River, which was the focus of most of the research on native fish c1900-20 by NSW State Fisheries, are overrepresented in museum records. The preserved specimens of known origin from wild populations, which number under 30 fish from 12 locations (Bathurst, Bredbo, Tharwa, Gundagai, Wagga Wagga, Narrandera, Yanco, Hay, Thornton, Yarrawonga, Swan Hill, Purnong) indicate that Trout cod were present over a large area of the southern half of the Murray-Darling Basin, but there are simply too few to reliably infer its habitat preferences.

Brown *et al.* (1998) cited evidence from 'Davis (1995)' that juvenile Trout cod exhibited a preference for high water temperatures, suggesting that the species was not associated with the upper reaches of the rivers. No reference was provided for this source, nor was any detail of methodology or data. Lake (1967a) reported that adult Trout cod held in ponds died when handled at higher temperatures, while Murray cod were not affected. These observations were confirmed by an associate of Lake, who reported that some of the fish weighing approximately 5-12 kg, died when handled at 68 °F (20 ^{o}C) and all at higher temperatures (Vic Pay, pers. com.). Merrick and Schmida (1984) reported that while Trout cod held in aquaria withstood temperatures up to 28 ^{o}C for short periods, they suffered bacterial and fungal infections when held at temperatures exceeding 25 ^{o}C for any length of time. Captive adult Trout cod held by Native Fish Australia for several years in aquaria have survived over a temperature range of 4-30 °C (Author's pers. obs.) and higher temperatures have been experienced in the ponds of some government facilities holding adult Trout cod (Douglas *et al.,* 1994). These limited, anecdotal, conflicting observations on the temperature tolerances of Trout cod are of little value in identifying the species former habitat associations, compared with well documented historical records.

During this project 233 locations were identified as the source of probable or certain historical accounts of captures of Trout cod with an additional 228 locations identified as the source of captures of cod of undetermined identity. The collected evidence on the species abundance was used to develop rarity scores using the probable or certain historical accounts. The following table provides averages for the rarity scores created in each habitat zone in each catchment for Trout cod using historical evidence in this investigation:

Table 23.2 Trout cod Average Rarity Scores

	Zones			
Area	**Lowland**	**Slopes**	**Upland**	**Montane**
NSW & ACT	2.8	3.8	4.6	3.4
VIC	2.9	4.4	1.9	0.8
SA	1.7			
Basin	2.6	4.2	2.9	2.0

The average rarity scores suggest that in NSW Trout cod were common in the lowland zone (2.8), very common in the slopes zone (3.8), reasonably abundant in the upland zone (4.6) and common in the montane zone (3.4). The lowland score has been strongly influenced by the fact that Trout cod, while clearly abundant in the middle Murrumbidgee and Murray Rivers and possibly the upper Edward River, were less common, rare or absent in some such as the lower Lachlan River where they were unreported. If the scores for the lowlands in the Macquarie and Lachlan Catchments are ignored, the average rarity score for the lowlands in NSW rises to 3.6 implying that they were very common in this habitat south of the Lachlan. Some uncertainty exists for the rarity scores in non-lowland habitats in NSW. While there is good evidence that Trout cod were present and very common in the lower montane zone in the Murrumbidgee River, the evidence for this zone in other catchments, namely the Macquarie, Lachlan and Upper Murray catchments, is less substantial. In most cases these records originated from only the lower reaches of the montane zone, and the rarity scores should not be used to infer that they were generally common throughout this type of habitat; though in the Lachlan River there is evidence of cod being present near its source (Lhotsky, 1979). There is also uncertainty in the score given to Trout cod in the upland zone of the Murrumbidgee River. This score has been largely inferred based on their documented presence in the Tharwa area and their abundance in similar habitats elsewhere. Even allowing for a potential reduction in some of these non-upland scores, if new evidence is found, the average rarity scores suggest that in NSW the species was, in general, strongly associated with non-lowland habitat as well as being abundant in some areas in the lowlands.

In Victoria the average rarity scores suggest that while Trout cod were common in the lowland zone (2.9), they were strongly associated with the slopes zone where they were fairly abundant (4.4), had a modest presence in the upland zone (1.9) and a minor presence in the montane zone (0.8). The scores for the upland and montane zones to some degree may have been influenced by in-stream barriers, preventing access to these areas in some catchments such as the upper Campaspe River. In some upland rivers such as the Mitta Mitta, Trout cod were very common. As was the case in NSW, Trout cod were rare in some lowland areas, such as the lower Loddon River, and while in others were reported to be common, it was only in the lower Ovens that the species was clearly abundant in a lowland river. Some uncertainty exists on the original abundance of Trout cod in the lower Goulburn and Broken Catchments, and there is the potential for additional historical evidence to strengthen the scores in these areas and, as a consequence, the average score in Victoria for the lowlands. Oral history generally recalls Trout cod to have been more abundant than Murray cod in the smaller rivers and creeks in the slopes zone. Overall, the rarity scores suggest that Trout cod were strongly associated with the slopes zone in Victoria. The average rarity score of 1.7 for South Australia reflects the evidence that Trout cod, while being locally common upstream, declined in abundance downstream to be rare in the lower reaches of the Murray in that state. The collective results for the Basin suggest that Trout cod, on average, were most abundant in the slopes zone (4.2) and common in the uplands (2.9) and lowlands (2.6).

There are three rivers for which a substantial body of evidence exists demonstrating conclusively that Trout cod had originally been abundant. The first is the Murray River between Yarrawonga and Barmah, where their abundance was documented by Langtry (Cadwallader, 1977) and where they currently exist in substantial numbers in lowland habitat. The second is the Murrumbidgee River between Wagga Wagga and Narrandera, where most of the surviving museum specimens were collected and where the abundance of Trout cod was well documented by Stead and Jarman (NSW Fisheries Report, 1910; *Argus*, 1 October 1920). Wagga Wagga lies at the boundary between lowland and slopes habitats with Narrandera being in the lowland zone. The third is the Goulburn River between Eildon and Seymour, where oral history reporting Trout cod to have been abundant during the 1920s is validated by the existence of a number of superb photographs of catches of the species, and by a museum specimen (Berra, 1974). This section of the Goulburn River represents typical slopes habitat, with Seymour roughly at the boundary of slopes and lowland habitat.

While not as comprehensive, good evidence exists for Trout cod having been at least very common near the top of the upland and lower montane zones of the Murrumbidgee River, the Murrumbidgee River between Narrandera and Bringagee, the upper Edward River, the Murray River from Corowa to Brigenbrong, the Mitta Mitta River along its length upstream to the lower montane zone, the slopes zone of the Kiewa River, the lowland and slopes zone of the Ovens River, the slopes zone of the Campaspe River, the Central Murray River near Swan Hill and the Lower Murray River between Wentworth and Berri. Limited evidence confirms the presence of Trout cod in a number of waters where they were probably also very common including the upper Macquarie River, the upper Lachlan River and the upper Loddon River.

No evidence has been located of Trout cod being taken from the Darling River and both Jarman and Larsen reported that they were absent (*Argus,* 1 October 1920; 26 February 1932). Anglers have suggested that a second type of cod or 'rock cod' was formerly present in the upland habitat of the Gwydir River, although no evidence has been found to substantiate these reports. Trout cod were probably absent from the Murray-Darling streams in Queensland. In 1879 angler Don Donovan wrote a detailed account comparing the features of Murray cod and eastern freshwater cod. Discussing the cod of the western rivers he explicitly stated that 'none of the cod which I have caught in any of those streams ever varied in any one particular' (*Brisbane Courier,* 17 September 1879). As Donovan identified subtle differences between the eastern freshwater cod and Murray cod, if he had encountered Trout cod it is likely he would have recognised them as being different, suggesting their absence at that time.

Early accounts from explorers and newspapers indicate that cod penetrated well into the montane zone in some areas such as near Gunning (Lhotsky, 1979), near Cooma, where they were present in their thousands, (*Sydney Morning Herald,* 10 March 1915) and near Omeo (*Omeo Standard*, 2 December 1902). The oral history and photographs collected, while somewhat limited, indicate that of the two species of cod it was Trout cod that was most common in these high altitude areas. A Trout cod captured downstream of the Tantangara Dam near Yaouk in the early 1970s at around 1100 m ASL represents the current altitude record for the species. In the slopes, upland and montane zones Trout cod are consistently reported in the oral history to have exceeded Murray cod in relative abundance and in some areas were the only species of cod taken.

It can be concluded that the historical evidence reconciles the two contrasting views on Trout cod distribution and habitat association as both being in part correct but incomplete. The species was found from the Macquarie Catchment southwards and west into South Australia. The general trends from the rarity scores suggest that in the northern part of the species range, namely the Macquarie and Lachlan catchments, Trout cod were primarily an upland species with a significant presence in the slopes zone, but that progressively south the favoured habitat shifted downstream into the slopes and eastern parts of the lowlands, though with a significant presence generally in the upland zone. The historical evidence supports the modern view of the central Murrumbidgee and central Murray Rivers as excellent Trout cod habitat, but also indicates that large rivers in the slopes zone, such as the Goulburn and upper Murray Rivers, also supported large populations. The stronghold of Trout cod appears to have been the eastern lowlands, slopes and lower upland rivers. If the two disjunct populations in the upper Macquarie and upper Lachlan catchments are ignored, the Trout cod's former centre of distribution, rather than being the Central Murray and Murrumbidgee Rivers, is best identified with the Hume Highway between Seymour and Gundagai.

23.1.5 Translocations

Many of the early translocations of cod, such as those to Lake George, Lake Burrumbeet and the Yarra River were from upland areas, and probably included Trout cod. Most of those translocated populations

disappeared without leaving conclusive evidence as to which cod species were present. The translocations of cod to the Yarra River from 1857 to the 1870s (Wilson, 1858; Trueman, 2007) included Trout cod, forming a substantial population at least as far upstream as Healesville (*Argus,* 8 September 1898). In past years some elderly anglers informed the author that Trout cod were present in the Yarra River, but by the 1930s cod had become generally scarce and no Trout cod were captured after that time.

The cod translocated to Cataract Reservoir in the Nepean Catchment near Sydney from the Berembed Weir area in 1916 (NSW Fisheries Reports, 1914; 1923) included Trout cod which established a population. They were discovered to exist in significant numbers during the 1970s (Rod Harrison, pers. com.) though have extensively hybridized with Murray cod (Trout Cod Recovery Team, 2008). The cod translocated to the upper Seven Creeks from the Goulburn River and middle Seven Creeks during 1921-2, and from the Ovens River to Lake Sambell in 1928, contained Trout cod based on their presence in those waters decades later (Berra & Weatherly, 1972). Angler reports suggest that small numbers of Trout cod were present in the upper Shoalhaven River and probably originated from translocation activities during the 1870s (*Queanbeyan Age,* 17 May 1876). A newspaper account specifically identified 'trout' being shipped to the Avoca River (*Australasian,* 12 March 1870) and one suggested that 'Murray trout' may have been shipped to West Australia by William Saville-Kent (*Hobart Mercury,* 30 November 1911).

23.1.6 Size

Historical accounts generally reported Trout cod to be a smaller species than Murray cod. A maximum size of 10 lb. (4.6 kg) was reported for them in the Coliban River (*Argus,* 17 March 1911) while Jarman concluded that in the Murrumbidgee River near Narrandera 'a fish of 8lb. or 10lb. is a giant, the female always the largest' (*Argus,* 20 July 1917). Stead stated that 'a Trout Cod of fifteen to twenty pounds is quite a large one, and five pounds would be nearer to the normal size of large specimens' (Stead, 1929b). In contrast is the large size of the Trout cod in the Central Murray River documented by Langtry who captured fish up to 25 lb. (11.4 kg) as well as many over 10 lb. (4.6 kg) (Cadwallader, 1977). Some newspaper reports may have documented very large specimens. One account records the capture in the Ovens River near Wangaratta in 1908 of a 65 lb. (29.64 kg) cod which 'was of a peculiar bluish color, commonly known as a blue cod' (*North East Ensign,* 25 December 1908). The oral history and photographs indicate that in some waters Trout cod were commonly caught up to 5 kg in weight, and fish up to twice that figure were taken at regular intervals. Even in the comparatively small Seven Creeks 15 to 20 lb. (6.8 to 9 kg) specimens have been documented (Halsall, 1979). Trout cod are capable of relatively fast growth. One fish, of about a kilogram placed in a hatchery pond well stocked with yabbies, when removed six months later weighed 3.1 kg (Author's pers. obs.).

The maximum size to which Trout cod grow has been generally reported is 16 kg, this limit being traced back to John Lake. Lake's expression 'about 16 kg' in his descriptions (1967b: 1971) suggests that he did not weigh a Trout cod that size. He was aware of Langtry's manuscript which cited George Clarke, a local professional fisherman and fishing inspector at Barmah, as having taken a Trout cod weighing 32 lb. (14.6 kg) (Cadwallader, 1977) and may have rounded the 32 lb. to be 16 kg. Roy Holt of Beechworth captured c1950 a specimen a few ounces over 50 lb. (22.7 kg) from Lake Sambell which was weighed and sold, suggesting an accurate weight. Its capture is well corroborated by many witnesses in Beechworth, some of who were familiar with Trout cod. Oral and photographic evidence indicates that Holt captured a number of other Trout cod in the 30 to 40 lb. (13.6 to 18.2 kg) range from Lake Sambell. As Murray cod have not been reported from the lake there is little doubt as to the identity of the 50 lb. fish. It is a far better claim for a species record than the 16 kg widely quoted considering that specific details on a capture location or date for the particular 16 kg fish have never been provided. From Holt's capture it can be concluded that Trout cod can reach a weight of 22.7 kg. Other

accounts including those of Laddie Clifford, Henry Davies, Bert McKenzie, Roy Grant, Tom Jarvis, Reg Redrop and Bert Roberts generally reported a 20 lb. (9.0 kg) Trout cod to be a big fish but that rare captures of fish in the 50 to 80 lb. (22.7 to 36.4 kg) range occurred, though they were considered to be exceptional.

23.1.7 Historical Life History Observations

Stead reported that 'the average length of trout cod at maturity is 10 inches, with a weight of about 6 oz' (NSW Fisheries Report, 1914) and that two female fish from the Murrumbidgee weighing 8 and 9 oz contained 'advanced roe' (Stead, 1929b). Jarman suggested that Trout cod could be mature at three years of age and as small as 4 oz in weight (*Argus,* 20 July 1917). The age estimate suggests that NSW State Fisheries may have investigated the growth rate of the species around that time. Lake (1967a) stated that the eggs of Trout cod were larger than those of Murray cod and this was also reported by commercial fisherman R. J. Larsen (*Argus,* 12 February 1932). In contrast Stead believed that Trout cod produced smaller eggs (Stead, 1929b). Larsen noted that the ovaries of Trout cod were of a different shape and that some fins were larger compared to those of Murray cod (*Argus,* 12 February 1932).

Stead (1929b) stated 'The Trout Cod loves moving waters, and is most commonly found in the vicinity of river bends or "tarcoolas." Here, against a fairly deep bank, is the best spot to try for Trout Cod'. Anglers consistently report, both in the past and present, that Trout cod favour areas of flowing water, often near snags (e.g., *Argus,* 8 September 1898) though wooden debris has not always been a feature. In the Murray River Trout cod were known as 'rock cod' due to their association with areas of clean hard substrates such as clay banks, rocky reefs and sandy beaches. In slopes and upland habitats anglers reported the species to have been taken at the heads of holes in running water over rock or gravel substrates. They have also been observed to reside in stands of fringing vegetation when other cover has been absent (Author's pers. obs.). Stead (1929b) reported that Trout cod were rarely found in lagoons a view supported by Jarman (*Argus,* 15 July 1914).

Langtry and Tubb (Cadwallader, 1977) noted a tendency for Trout cod to spawn earlier than Murray cod as have some anglers such as Stan Walsh at Dartmouth. Anderson at Bringagee (Whitley, 1937) and Tubb at Barmah (Cadwallader, 1977) indicated that Trout cod spawned as early as September. Roughley (1955) reported that cod sometimes spawn as late as January. A recently spent female Trout cod was captured in the Seven Creeks by the author in late December 1980 (Author's pers. obs.). Historical sources suggested that cod in the past undertook mass movements considered to be migrations from the lowlands upstream towards headwater areas (NSW Government, 1880; *National Advocate*, 13 January 1925; *Sydney Morning Herald,* 1 December 1863, 22 September 1894). Dakin and Kesteven (1938) suggested that Trout cod were a migratory species, anecdotal evidence reported that Trout cod tagged in the early twentieth century by NSW investigators travelled several hundreds of kilometres (Laddie Clifford, pers. com.) and the Yorta Yorta people considered the species to be migratory (Don Briggs, pers. com.). Although few details have survived tagging experiments were undertaken with the species in the Murrumbidgee River (*Argus,* 20 July 1917).

Langtry reported the main item in the diet of Trout cod to be yabbies (Cadwallader, 1977). Trout cod sometimes feed at the surface on terrestrial items, in the Seven Creeks they have been observed consuming large black cicadas and grasshoppers and, in a number of instances, rising in numbers on insect hatches at the surface (Author's pers. obs.). This type of surface feeding behaviour was described in a newspaper account: 'the "trout" frequents the most rapid portions of the stream, and feeds near the surface. I have frequently observed them rising at flies and other insects in a manner similar to the English trout' (*Argus,* 8 September 1898). Stead also suggested that they exhibited surface feeding behaviour (*Sydney Morning Herald,* 15 July

1914). Murray crayfish, yabbies, scarab beetles, skinks, Blackfish, frogs, worms, small birds, a black snake, mice and even a platypus have been found in the stomachs of Trout cod taken from the Seven Creeks (Barney Kipping, pers. com.). A Trout cod taken from the Seven Creeks near Strathbogie and placed in a bucket ate a Blackfish while an angler sat next to it (*Argus,* 28 June 1934), while one captured from the same stream placed in a plastic drum ate four Blackfish during a 90 minute car journey (Author's pers. obs.). Trout cod from Bendora Reservoir in the ACT contained Blackfish, freshwater prawns and yabbies (Lintermans, pers. com.).

Cod have been frequently reported to eat other cod and a Murray cod of 25 lb. held in one of NSW State Fisheries ponds at Prospect near Sydney ate a Trout cod of 4 lb. (*Sydney Morning Herald,* 13 November 1914). R. J. Larsen reported the belief of professional fisherman that Murray cod were highly antagonistic towards 'trout' (Trout cod) and they would kill tethered Trout cod:

> If cod and trout of the same size are tethered and a big wandering cod comes along he will invariably tackle the trout first. Mr. Larsen has put it to the test by tethering alternately two or three trout with the same number of cod and often found all the trout had been attacked, but not one cod (*Argus,* 12 February 1932).

23.1.8 Community Value

In the commercial fishery along the Murray and Murrumbidgee Rivers, Langtry's observations indicate that Trout cod were a component of the total cod catch, their proportion steadily increasing upstream. Near Yarrawonga they rivalled the take of Murray cod. He also reported that Trout cod would die more readily, struggle on tethers and its flesh would not keep as well as that of Murray cod (Cadwallader, 1977). Some of these observations have been repeated in the recollections of commercial fishermen interviewed. At Barmah, prior to refrigeration, fish destined for Melbourne were packed in wet gum leaves and the 'bluenose' were generally sold locally because they 'wouldn't keep as well as the cod' (Laddie Clifford, pers. com.). A newspaper account recorded that few baskets of 'trout' were forwarded to Melbourne from the Murray Fishery (*Sydney Morning Herald,* 17 June 1902). Most people interviewed described the flesh of Trout cod as drier than that of Murray cod, with less fat. Some people savoured the fat in Murray cod, but many did not and preferred Trout cod. The opinion of most correspondents to newspapers was that the 'Murray trout' was a superior table fish to Murray cod with some stating that it was without peer (eg. *Argus,* 17 March 1911).

Recreational fishermen universally recognised Trout cod as a superior angling fish to Murray cod, rated by many as the best species in the Basin. In waters where both cod species were common, Trout cod were often overshadowed by Murray cod due to the large size of some specimens of the latter. However accounts, such as that of Henry Davies, indicate that in the lowlands some anglers selectively targeted Trout cod in preference to Murray cod. In north east Victoria, where Trout cod were the prevalent cod species in many waters, the historical evidence indicates that they were the primary target of anglers, many recognising them as distinct to Murray cod (Rhodes, 1999). This was also probably the case in the upper reaches of the Macquarie, Lachlan and Murrumbidgee Rivers. In these areas Trout cod and Macquarie perch formed the key components of the recreational fishery. There is clear evidence from an early date that anglers widely distinguished 'Murray trout' from Murray cod as an esteemed angling species (*Argus,* 8 September 1898; 17 March 1911; 18 January 1913) including a poem published in the illustrated magazine *Melbourne Punch* in 1864 (*Hobart Mercury,* 30 April 1864):

The Murray trout may swim about,
With unmolested cod,
And Yarra herrings from that day
Need never dread the rod. *

23.1.9 Decline & Current Status

Rowland (1989) presented historical evidence indicating that commercial fishing had impacted on stocks of cod by the late nineteenth century and, as in some areas Trout cod were a significant proportion of the cod taken, it is likely that they had experienced a decline in these waters. By the end of the First World War cod had become rare in most of the higher altitude areas reported to contain them in the past, such as the Fish and Duckmaloi Rivers near Bathurst, the upper Lachlan River near Gunning, the upper Indi River, the upper Mitta Mitta River near Omeo and the upper King River above Cheshunt. Significant numbers remained in the Murrumbidgee River near Cooma, though reduced compared to past years. As the historical evidence suggests that Trout cod were prevalent in these waters, it appears that they first disappeared from the upstream areas of their range.

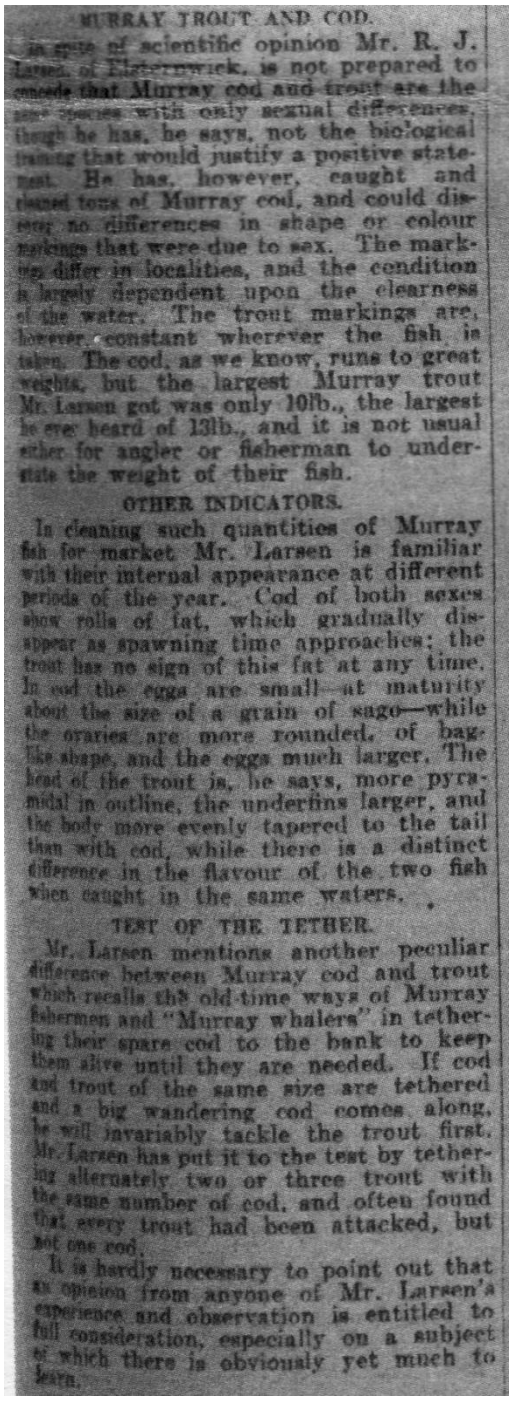
The historical evidence suggests that the greatest decline in Trout cod populations occurred from 1920-40 and in some cases large fish kills were associated with their disappearance. These include the Central Murrumbidgee River during the 1920s; the upper Lachlan River c1928; the middle reaches of the Goulburn River c1927-29; the Murray River between Albury and Yarrawonga c1928-34; the Upper Murray River in the 1930s and the Kiewa River in 1939 as well as many smaller streams over this period. By World War Two the species remained relatively abundant in the Ovens River and the Murray River between Yarrawonga and Barmah but, to a large degree, only remained as small populations elsewhere. The oral history indicates that all of these remaining populations continued to decline during the 1950s and 1960s. It has been suggested that the primary reason for the disappearance of Trout cod, at least in the lowlands, was the desnagging of rivers (Trout Cod Recovery Team, 2008). Langtry's records (Cadwallader, 1977) indicate that Trout cod remained common up to 1950 after the near complete removal of wooden debris from the Murray River between Yarrawonga and Barmah during the late nineteenth century (Public Works Department Victoria, 1867; Victorian Government, 1867; *Argus,* 18 February 1869; *Riverine Herald,* 19 June 1869). This suggests that while desnagging may have played an important role in their decline in some waters, it may not have been the primary reason for their disappearance. The collective historical evidence suggests that a suite of agents may have been responsible.

Berra and Weatherly (1972) in 1969-70 obtained Trout cod from only three waters, two of which contained translocated populations, with only a single fish being taken from within the species natural range in the Murrumbidgee River near Tharwa. The oral history indicates that the Trout cod population downstream of Yarrawonga had dwindled by 1970, with few fish being caught, but at the end of the decade had begun to recover. The translocated population in Lake Sambell was lost through successive fish kills in the early 1970s. Local extinctions continued until the middle 1980s, by which time only one wild population remained in the Murray River between Yarrawonga and Cobram, and two translocated populations existed in Seven Creeks and Cataract Reservoir.

Trout cod are listed as endangered under the Federal *Environment Protection and Biodiversity Conservation Act* 1999. In NSW Trout cod are listed as endangered under the *Fisheries Management Act 1994*; in the ACT are classified as endangered under the *Nature Conservation Act 1980;* and in Victoria are listed as threatened under the *Flora and Fauna Guarantee Act 1988*. In South Australia Trout cod are considered to be extinct and are protected by regulations under the *Fisheries Act 2007.* At the present time Trout cod are totally protected and cannot be taken by anglers in all states.

Since the late 1980s, liberations of hatchery produced Trout cod have established some significant populations, with evidence of reproduction in Bendora Dam, the Murrumbidgee River between Wagga Wagga and Narrandera, the upper Murray River between Walwa and Tintaldra, the Macquarie River between

Wellington and Warren, the Goulburn River near Murchison and the Ovens River. The wild population in the Murray River below Yarrawonga has undergone a substantial recovery, with the species being now common downstream to Barmah, and captures reported near Swan Hill. The Trout cod National Recovery Plan (Trout Cod Recovery Team, 2008) stated that one of the goals is ultimately to recover populations of the species to allow recreational angling, and proposed that a recreational fishery be established in an impoundment. In 2008 DPI Victoria commenced stocking Trout cod into Lake Kerford near Beechworth to develop a pilot recreational fishery and the stocking was extended to include Lake Sambell in 2010. It has been proposed that Trout cod be stocked into the Goulburn River near Trawool to aid in the recovery of the species and to develop a pilot recreational fishery in a river.



MURRAY TROUT AND COD.

In spite of scientific opinion Mr. R. J. Larsen, of Elsternwick, is not prepared to concede that Murray cod and trout are the same species with only sexual differences, though he has, he says, not the biological training that would justify a positive statement. He has, however, caught and cleaned tons of Murray cod, and could discern no differences in shape or colour markings that were due to sex. The markings differ in localities, and the condition is largely dependent upon the clearness of the water. The trout markings are, however, constant wherever the fish is taken. The cod, as we know, runs to great weights, but the largest Murray trout Mr. Larsen got was only 10lb., the largest he ever heard of 13lb., and it is not usual either for angler or fisherman to understate the weight of their fish.

OTHER INDICATORS.

In cleaning such quantities of Murray fish for market Mr. Larsen is familiar with their internal appearance at different periods of the year. Cod of both sexes show rolls of fat, which gradually disappear as spawning time approaches; the trout has no sign of this fat at any time. In cod the eggs are small—at maturity about the size of a grain of sago—while the ovaries are more rounded, of bag-like shape, and the eggs much larger. The head of the trout is, he says, more pyramidal in outline, the underfins larger, and the body more evenly tapered to the tail than with cod, while there is a distinct difference in the flavour of the two fish when caught in the same waters.

TEST OF THE TETHER.

Mr. Larsen mentions another peculiar difference between Murray cod and trout which recalls the old-time ways of Murray fishermen and "Murray whalers" in tethering their spare cod to the bank to keep them alive until they are needed. If cod and trout of the same size are tethered and a big wandering cod comes along, he will invariably tackle the trout first. Mr. Larsen has put it to the test by tethering alternately two or three trout with the same number of cod, and often found that every trout had been attacked, but not one cod.

It is hardly necessary to point out that an opinion from anyone of Mr. Larsen's experience and observation is entitled to full consideration, especially on a subject of which there is obviously yet much to learn.

Argus, 12 February 1932

MURRAY TROUT AND COD

In spite of scientific opinion Mr. R. J. Larsen Of Elsternwick, is not prepared to concede that Murray cod and trout are the same species with only sexual differences, though he has, he says, not the biological training that would justify a positive statement. He has, however, caught and cleaned tons of Murray cod, and could discern no differences in shape or colour markings that were due to sex. The markings differ in localities, and the condition is largely dependent on the clearness of the water. The trout markings are, however, constant wherever the fish is taken. The cod, as we know, runs to great weights, but the largest Murray trout Mr. Larsen got was only 10 lb., the largest he ever heard of 13lb., and it is not unusual either for anglers or fishermen to understate the weight of their fish.

OTHER INDICATORS

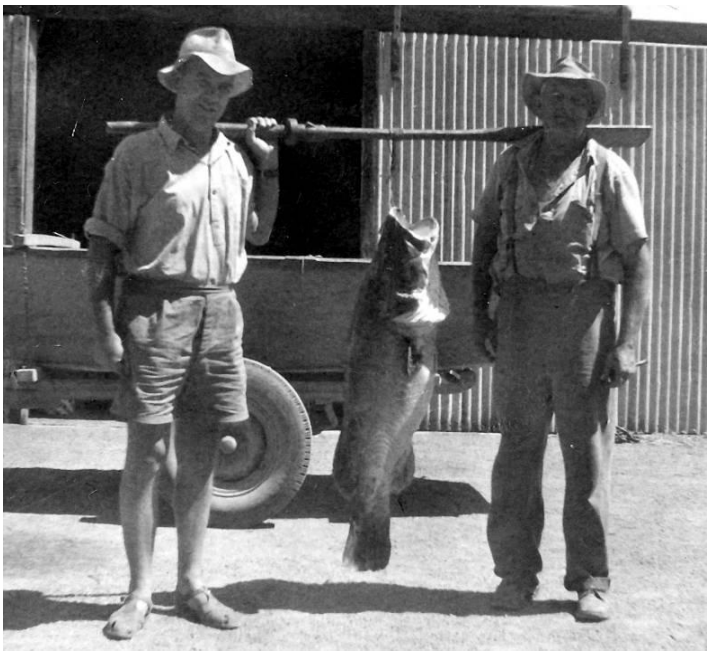
In cleaning such quantities of Murray for the market, Mr. Larsen is familiar with their internal appearance at different periods of the year. Cod of both sexes show rolls of fat, which gradually disappear as spawning time approaches; the trout has no sign of this fat at any time. In cod the eggs are small – at maturity about the size of a grain of sago – while the ovaries are more rounded, of bag-like shape, and the eggs much larger. The head of the trout is, he says, more pyramidal in outline, the underfins larger, and the body more evenly tapered to the tail than with cod, while there is a distinct difference in the flavour of the two fish when caught in the same waters.

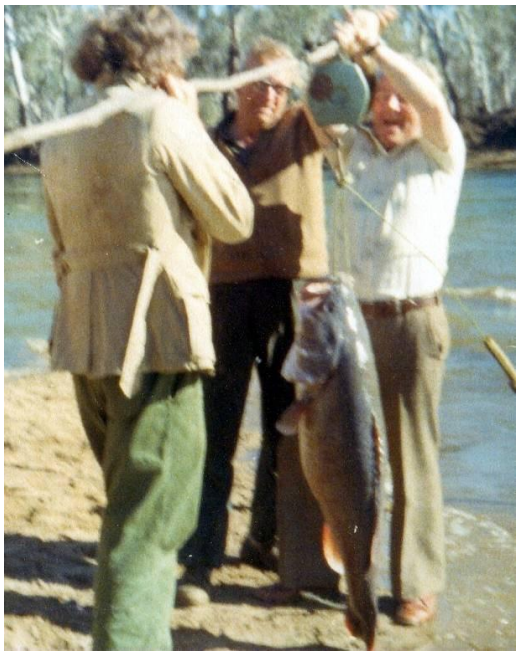
TEST OF THE TETHER

Mr. Larsen mentions another peculiar difference between Murray cod and trout which recalls the old time ways of Murray fishermen and "Murray whalers" in tethering their spare cod to the bank to keep them alive until they are needed. If cod and trout of the same size are tethered and a big wandering cod comes along, he will invariably tackle the trout first. Mr. Larsen has put it to the test by tethering alternatively two or three trout with the same number of cod, and often found that every trout had been attacked, but not one cod.

It is hardly necessary to point out that an opinion from anyone of Mr. Larsen's experience and observation is entitled to full consideration, especially on a subject to which there is obviously yet much to learn.

Photograph 23.2 Big Trout Cod in the Past

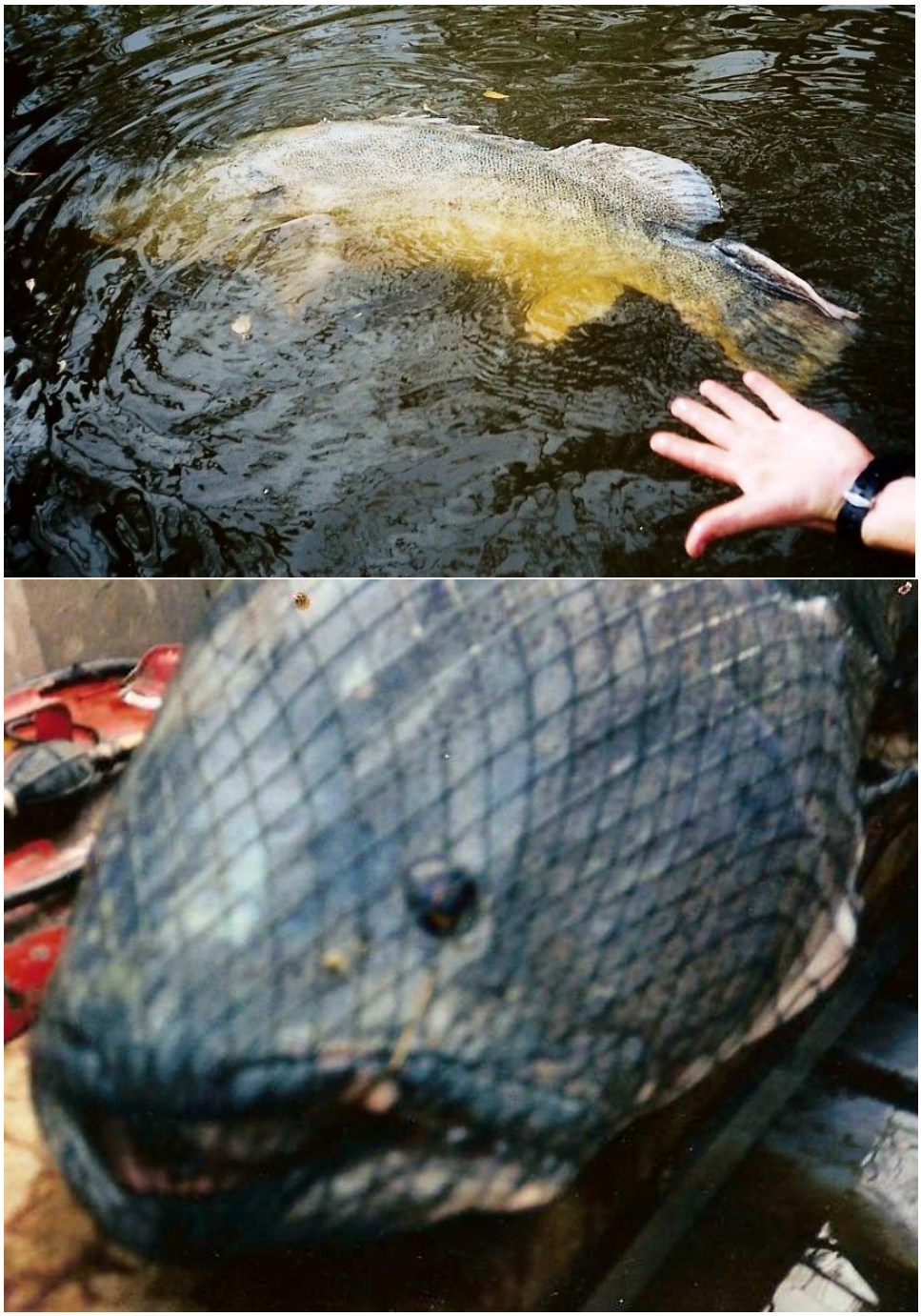




Left: Photo MR28. Albert Roberts (left) and John Cooper hold a 'rock cod' weighing 58 lb. (26.3 kg) caught in the Murray River at Bruces Bend near Yarrawonga in 1952. Although not conclusive the body shape and the relative length of the head and upper jaw suggests that it could be a Trout cod.

Right: Photo MR51. The late Reg Reddrop weighs what is believed to be a large Trout cod taken from the Murray River downstream of Tocumwal. The blue appearance of the head is quite striking. In the original photo small black dashes were also apparent and its general features suggest that the fish is a Trout cod. John Lake suggested a maximum weight for Trout cod of about 16 kg though fishermen claim that fish exceeding twice that weight were taken though were rare. Photos courtesy of Albert Roberts and Greg and Wendy McKenzie.

Photograph 23.3 A Giant Trout Cod Today?

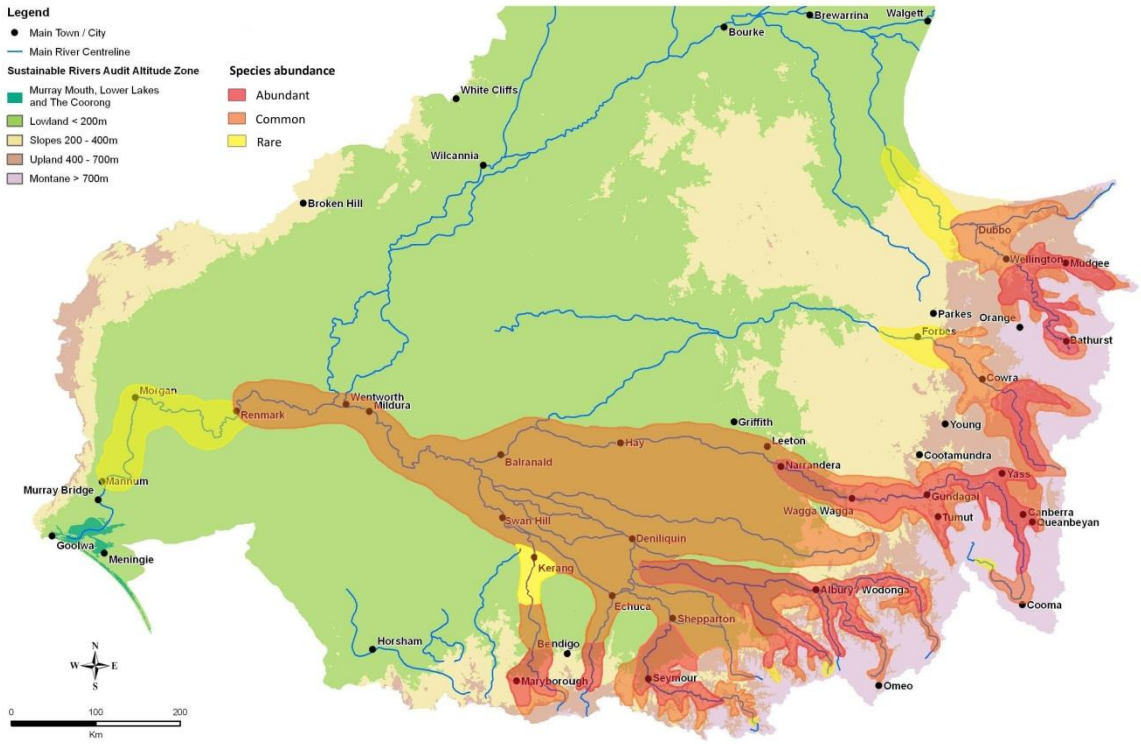


Two of a set of photos of a cod captured, photographed and released by Heath McKenzie and John Breen from the Yulupna Creek in December 2000. The images are the only photographic evidence seen by the author that could be a contemporary capture of a giant Trout cod. In the top image of the general speckling is vivid while in the lower image the pointed snout and blue colour are evident. McKenzie reported that the top jaw overhung the lower jaw. Opinion is divided on whether the animal is a Trout cod. Professor Tim Berra, who captured specimens exceeding 10 kg in Lake Sambell, has indicated to the author that it is probably a Trout cod. Photos courtesy of Heath McKenzie.

Photograph 23.4 The Seven Creeks: A Last Upland Refuge

Many anglers are familiar with the Murray River between Yarrawonga and Barmah and are aware of its importance as a habitat for Trout cod. These two images illustrate the very different Trout cod habitat in the Seven Creeks. During the late 1960s in the stretch of water in the top photo Trout cod from three kilograms down to three inches were in residence with the author recalling on one occasion a dozen fish being angled from the run depicted. The bottom photo illustrates an example of pool habitat which exists in the creek and this particular spot was also a favoured location for Trout cod. In December 2007 individual fish could be seen patrolling near the rocks in the middle of the day. Both photos author.

Figure 23.1 **A Reconstruction of the Historical Distribution & Abundance of Trout Cod in the Southern Murray-Darling Basin**



23.2 Murray cod, *Maccullochella peelii*

RECORD MURRAY COD

Head Shown By Mr. Hale At Anglers' Meeting

"This is the head of probably the largest cod ever taken in the South Australian waters of the River Murray," the Director of the Adelaide Museum (Mr. H. M. Hale) told members of the S.A. Fish Protection and Anglers' Association at the annual meeting held at the Exchange Hotel, Adelaide. Mr. Hale displayed the head of a Murray Cod which made members gasp in astonishment. He estimated that the fish must have measured 6 to 8 feet long.

The president of the association (Mr. E. G. Saunders) suggested that the fish would possibly have weighed 300 lb., and might have been over a hundred years old. Mr. Hale said that the head had been recently discovered at the Adelaide Museum. He could not trace any reference to it, and asked members of the association whethey they had heard anything about the catching of this record fish. He thought the head had been in the Museum for over twenty years.

Mr. E. A. Giles mentioned that he had heard of a record cod being caught near Kingston-on-the-Murray, and would try to obtain information concerning it.

Adelaide Advertiser, 13 December 1935

RECORD MURRAY COD

Head Shown By Mr. Hale
At Angler's Meeting

"This is the head of probably the largest cod ever taken in the South Australian waters of the River Murray," the Director of the Adelaide Museum (Mr. H. M. Hale) told members of the S.A. Fish Protection and Anglers' Association at the annual meeting held at the Exchange Hotel, Adelaide. Mr. Hale displayed the head of a Murray Cod which made members gasp in astonishment. He estimated that the fish must have measured 6 to 8 feet long.

The president of the association (Mr. E. G. Saunders) suggested that the fish would possibly have weighed 300lb., and might have been over a hundred years old. Mr Hale said that the head had been recently discovered at the Adelaide Museum. He could not trace any reference to it, and asked members of the association whethey [sic] they had heard anything about the catching of this record fish. He thought the head had been in the Museum for over twenty years.

Mr. E. A. Giles mentioned that he had heard of a record cod being caught near Kingston-on-the-Murray, and would try to obtain information concerning it.

23.2.1 European Discovery

When Europeans first encountered Murray cod is uncertain, whilst there are the many very early references to cod in the Bathurst area, they do not include sufficient detail to provide an accurate identification. Rene Lesson's drawing, description and holotype of a Trout cod is the exception (Lesson, 1825). Oxley (1820) in May 1817 captured a 70 lb. cod from the Lachlan River at Solway Flats, recording the coloration as being 'speckled over with brown, blue and yellow spots, like a leopard's skin'. The description matches that of a Murray cod and can be considered the first credible report of the species. It was not until January 24, 1832 that an accurate, detailed description and illustration of Murray cod was recorded by Mitchell, based on specimens captured from the Peel River (Mitchell, 1838).

Photograph 23.5 The First Murray Cod

Major Thomas Mitchell created this illustration of a cod obtained from the Peel River in January 1832 which he named *Gristes peeli*. It is the first indisputable historic record for Murray cod (Mitchell, 1838). Image reproduced with permission from the collection of the *State Library of Victoria.*

23.2.2 Aboriginal Names

Aboriginal names recorded for Murray cod include 'Ponkoo' near Blanchetown (Morunde) and Loxton in South Australia (French, 1847; *Argus,* 19 September 1848), 'Ponde' in the Lake Alexandrina (Ngarrindieri) area (*Adelaide Observer*, 25 November 1865; Zeitz, 1902), 'Barnta' in the Mildura area (Yari Yari) (Blandowski, 1858) and probably 'Mewuruk' in the Gundagai/Tumut/Yass area of the Murrumbidgee (Ngunawal) (Bennett, 1834). Ogilby (1893) recorded the name 'Kookoobul' being used by indigenous people on the Murrumbidgee probably sourced from William Macleay who provided quite a number of indigenous names for fish in a royal commission in 1880 (NSW Government, 1880). James Baylis compiled an extensive list of Wiradjuri words from the Wagga Wagga area in a hand written manuscript and later published a number of books on local history. He recorded the name for cod as being 'Googoobul' or 'Kookoobul' (Wesson, 2001). Hercus (1992) recorded 'Pandyil' as the term used by the Wemba Wemba people of central Victoria for Murray cod and 'Kurrumerruck' for one of great size, with the term 'Parnthall' reported in a newspaper originating from the same area (*Argus*, 5 April 1910). In the Yorta Yorta language Murray cod were known as 'Burnanga' (Bowe & Morey, 1999). Rowland (1989) reported Murray cod as being known as 'ponde' in the lower Murrumbidgee and lower Murray regions.

23.2.3 European Names

Mitchell (1838) provided the first scientific description for Murray cod, based on specimens he captured from the Peel River on January 24, 1832, naming them *Acerina Gristes Peelii mihi.* He considered that they were different from the description of the Bathurst specimen published by Cuvier and Valenciennes (1829). Richardson (1847) concluded that only one species of cod existed, so *peeli* was considered to be a synonym. Murray cod were generally referred to as *Grystes macquariensis* in the writings of naturalists until 1859 when Gunther (1859), of the British Museum, separated the American and Australian members of *Grystes.* Subsequently Murray cod was known as *Oligorus macquariensis* until 1929 when Whitley (1929), of the Australian Museum, recognising that the genus *Oligorus* to have been previously allocated to a genus of beetles, created the new genus *Maccullochella* for Murray cod (Whitley, 1929).

Murray cod was known as *Maccullochella macquariensis* until Berra and Weatherly (1972) separated Trout cod as a distinct species, identified Mitchell's description as being the earliest for Murray cod, and as a consequence allocated the name *Maccullochella peeli* to Murray cod. Rowland (1993) identified the existence of coastal species and subspecies of cod, and as a result Murray cod were classified as one of two subspecies of *peelii* (the other being the Mary River cod) and named *Maccullochella peelii peelii.* Recently Mary River cod have been recognised as a separate species and Murray cod are now known as *Maccullochella peelii* (Nock *et al.,* 2010).

To the early European settlers it was known as the 'cod fish' or Macquarie cod and, as European settlement expanded, became the Lachlan cod. It ultimately morphed into the now popular Murray cod. A number of historical sources suggested Murray cod were named after Sir Terrance Murray who translocated cod from the Molonglo River to the Lake George area in 1848, however, at least one newspaper article (*South Australian Register,* 27 January 1847) used the term 'Murray cod' prior to 1848 and the name is apparently derived from the species' association with the Murray River.

23.2.4 Distribution and Habitat

Lintermans (2007) recorded Murray cod as being historically widespread throughout the lower and mid-altitude reaches of the Murray-Darling Basin. During this project 333 locations were identified as the source of probable or certain historical accounts of captures of Murray cod with an additional 228 locations identified as the source of captures of cod of undetermined identity. The collected evidence on the species abundance was used to develop rarity scores using the probable or certain historical accounts. The following table provides averages for the rarity scores created in each habitat zone in each catchment for Murray cod using historical evidence in this investigation:

Table 23.3 Murray cod Average Rarity Scores

	Zones			
Area	**Lowland**	**Slopes**	**Upland**	**Montane**
NSW & ACT	5.0	4.9	3.4	2.0
VIC	5.0	3.6	1.0	0.1
SA	5.0			
Basin	5.0	4.0	1.9	0.9

The average rarity scores suggest that in NSW Murray cod were abundant in the lowland (5.0) and slopes zones (4.9) in all catchments, very common in the upland zone (3.4) and had a modest presence in the montane zone (2.0). There is some doubt about the score for Murray cod in the montane zone as there are few specific records for the species in this type of habitat. Historical accounts of the capture of very large cod and some oral history suggest they were present and taken with some regularity. These records originated from the lower reaches of the montane zone and the score should not be used to infer that they were widespread throughout this zone. In the upland zones of the Macquarie, Lachlan and Murrumbidgee Catchments there is good evidence that Murray cod were common to reasonably abundant, but in the upper Murray Catchment they appear to have been present but rare in this zone. Overall, in NSW in the southern part of its range, Murray cod were primarily a species of the lowland and slopes zones but progressively north, the species became increasingly common in the upland zone.

In Victoria the average rarity scores suggest that Murray cod were abundant in the lowland zone in all catchments (5.0), very common in the slopes zone (3.6) and regularly taken but comparatively rare in the upland zone (1.0) with an occasional presence in the montane zone (0.1). There are some good oral accounts indicating that Murray cod were present in the upland zone of some catchments including the Mitta Mitta and Goulburn but in others, such as the Broken, there are no specific records and their presence is largely inferred. The existence of Murray cod in the montane zone has been inferred in one catchment, the Mitta Mitta, based on accounts of possible captures well into the upland zone in this river. Overall, in Victoria Murray cod were primarily a lowland species that was common in the slopes zone, and had a minor presence in the upland zone. The average rarity score of 5.0 for South Australia indicates that the species was abundant throughout the lower Murray River.

Murray cod have been reported as being common to abundant in lagoon and lake habitats from an early date (Beveridge, 1889). Lagoons were the source of tens of thousands of Murray cod that were translocated in NSW (*NSW Fisheries Report,* 1917; Anderson, 1918). Stead (1929b) considered Murray cod to be 'at home' in lagoons, generally growing faster in them than in rivers. A number of historical accounts have reported depressions in lagoons which were concluded to be spawning sites of Murray cod. They were also common to abundant in lowland creeks and present in creeks in the slopes zone, though overshadowed in abundance in these habitats by Trout cod at least in Victoria. In lagoons in the slopes zone in Victoria only Murray cod have been reported and not Trout cod. In the uplands in NSW historical accounts suggest that Murray cod were most common in the larger rivers, appearing to have had a significant presence in some smaller ones such as the Yass River.

In conclusion, the collective results for the Basin suggests that Murray cod, on average, were abundant in the lowland zone in all catchments (5.0), very common to moderately abundant in the slopes zone (4.0), had a modest presence in the upland zone (1.9) and sometimes had a presence in the montane zone (0.9). In the south of their range they were primarily a fish of the lowlands, and secondarily the slopes zone, but increased in abundance in the slopes and upland zones progressively northwards. The altitude record for Murray cod appears to be around 700 m in the Cudgegong River at Rylstone and probably higher in the Murrumbidgee River near Cooma.

23.2.5 Translocations

Murray cod were acclimatized into many waters, the first being Lake George near Canberra in 1848, with fish sourced from the Molonglo River, establishing a large population (Gale, 1927). In 1876 cod from the Murrumbidgee River near Queanbeyan were released into the Mongarlowe River (*Queanbeyan Age,* 8 April

1876) and additional cod were sourced from the Queanbeyan River and transported to the Mongarlowe (*Queanbeyan Age,* 17 May 1876). Cod were translocated into the Nepean River as early as 1862 from the Murray River (*Hobart Mercury,* 23 December 1862). There is the possibility that cod may have also been endemic to the Nepean catchment, with a museum specimen apparently predating the translocation (*Sydney Morning Herald,* 18 August 1863). The population that developed in Lake George was used as a source to stock the Wollondilly and Cox's Rivers and Mulwarree Ponds near Goulburn in the Nepean Catchment (*Braidwood Independent,* 14 September 1867; NSW Government, 1880; Rowland, 1989). Many other fish were shifted around NSW, but the only other significant movements of cod from outside of the Murray-Darling Basin were to the Hunter River near Aberdeen, from the Namoi River (*Maitland Mercury & Hunter River General Advertiser*, 3 October 1885), the Cataract Reservoir and the Nepean River near Penrith, and Wallacia near Sydney, in 1916 from the Murrumbidgee River near Berembed Weir (NSW Fisheries Reports, 1914, 1923).

Cod were introduced into the Yarra catchment by Edward Wilson in 1857, with fish transported from the upper King Parrot Creek (Wilson, 1957). These initial releases were supplemented a few years later in 1864 with fish sourced from the Murray River near Echuca (Acclimatisation Society of Victoria, 1864); and the following decade from the Goulburn River (Trueman, 2007). Although almost disappearing by the 1970s, a significant population now exists in the Yarra River downstream of Coldstream (Author's pers. obs.). Another early introduction was to Lake Burrumbeet near Ballarat in 1858 from the upper Loddon catchment (*Ballarat Star,* 25 February 1858). A population was established that existed until exterminated by a drought (Clements, 1988). Murray cod were translocated to the Wimmera catchment in 1861 (*Argus,* 6 June 1866; 15 September 1911) and established populations in some waters such as Taylors Lake by 1949 (Cadwallader, 1977). Later translocations established breeding populations in Lake Charlegrark and Booroopki Swamp (National Murray Cod Recovery Team, 2010).

Other translocations took place to Lake Colac (*Argus,* 8 June 1858), the Barwon River at Fyansford in 1873 (*Argus,* 28 April 1873), the Avoca catchment and other locations in western Victoria (Cadwallader & Gooley, 1984), and to Tasmania (*Riverine Herald,* 30 March 1864) and West Australia (Morrisy, 1970). Juvenile native fish were sent to England with one shipment being lost (*Argus,* 7 June 1861). From another shipment cod were introduced into private ponds at an undisclosed location (*Argus,* 10 September 1862). Cod were dispatched from Melbourne to England in subsequent years, though their ultimate fate remains unknown (*Riverine Herald*, 17 February 1864). Since hatchery production of Murray cod commenced in the 1970s they have been stocked in additional waters outside of their natural range, in most instances appearing to have failed to establish breeding populations (National Murray Cod Recovery Team, 2010).

23.2.6 Size

The size to which Murray cod grow is legendary, with some debate as to what is the largest reliably recorded specimen. Bennett (1864) reported the stranding of a cod in excess of 120 lb. (54.6 kg) in the Cudgegong River near Mudgee in January 1836, the head of which was subsequently donated to the Australian Museum. There are many accounts, supported by photographic evidence, of cod reaching and exceeding this size and also a few accounts of cod reaching over twice that weight. Henry Davies' story of a 340 lb. (154.6 kg) specimen found dead in Kangaroo Lake near Kerang just after the Second World War, while plausible, is not corroborated by other evidence. The *Argus* (20 May 1857), citing the *Bendigo Advertiser,* reported the capture of a cod weighing 250 lb. (113.6 kg) from the Murray River but provided no details. The *Sydney Morning Herald* (13 September 1913) reported that a cod weighing 200 lb. (90.9 kg) had been caught from the Murrumbidgee River near Hay, but also failed to supply any additional information.

A newspaper correspondent reported that the largest cod taken commercially in South Australia weighed 225 lb. (102.3 kg) and was caught from the Murray River near Lake Bonney in 1914 (*Adelaide Advertiser,* 12 December 1935). The South Australian Museum is reported to have possessed the head of that fish, or of a larger example, being well over 200 lb. (90.9 kg) and perhaps as large as 300 lb. (136.4 kg) (*Adelaide Advertiser,* 13 December 1935). Lake (1959) reported that a specimen weighing 180 lb. (81.8 kg) cleaned had been taken, but provided no details. This may have been the fish referred to by Gilbert Whitley which measured six feet in length and weighed 182 lb. (82.7 kg) (Whitley, 1955). The largest Murray cod for which there is physical evidence weighed 150 lb. (68.2 kg), a plaster cast of which is held by *Museum Victoria* (Berra & Weatherly, 1972)

Berra and Weatherly (1972) and Rowland (1989, 2005) suggested the maximum size of Murray cod as being 250 lb. (113.6 kg) based on a newspaper article published in the *Sydney Morning Herald* on October 6, 1955:

> Murray cod
> Sir, - as an old enthusiastic fisherman, may I reply to the enquiry by Mr. W. A. Grose ("Herald," September 26) about the size of Murray cod? / during the big 1902 drought, the bridge work-men camped at the four-mile crossing of the Barwon River, Walgett. Disturbed by a great commotion in the water at night, they discovered the cause to be an outsize cod chasing other fish. They obtained a large hook made by a local blacksmith, baited it with a lump of kangaroo, the fastened it to fencing wire tied to a stake driven into the ooze. The monster was then lured to his doom. Conveyed to town, it was weighed and proved to be just on 250lb. It was exhibited in a marquee; the local bellman notified residents that 1/ would admit each one to view the giant, and the sum of £20 was raised for the local hospital. Coogee, W. G. Noble.

While a detailed account and plausible, there is no supporting evidence to validate the capture of the 250 lb. Murray cod from the Barwon River. The author of the news item reported other 250 lb. cod from the same area including a 'pet' that was used to tow boats perhaps, reducing the credibility of the evidence (*Sydney Morning Herald,* 9 July 1949). There is little doubt that Murray cod reached in excess of 200 lb. (90.9 kg) with the South Australian account and head providing the best proof, being possibly the best validated record at 225 lb. (102.3 kg).

23.2.7 Community Value

Rowland (1989, 2005) documented the extensive use that both Aboriginal people and Europeans made of Murray cod. The species was a key component of 'dreaming' stories with a giant cod being responsible for the creation of the Murray River. In much of the Basin, Murray cod was a staple in the diet of aboriginal people whose culture weaved many stories around the species. Numerous early accounts described their capture in nets, traps and by spear. One practice was night fishing using a fire in the front of canoes to attract the fish which were speared (French, 1847; McBride, 1898). Nets were also used to haul cod out of lagoons and backwaters of rivers (Graham, 1863; Beveridge, 1889).

In most waters in the inland fishery, Murray cod were the primary target of commercial fisherman who operated from the 1840s. By mass they were the most important component until the 1950s. In 1862 one operation alone, south of Deniliquin, harvested two to three tonnes of fish per week, being principally cod. In 1883, 147 tonnes of cod were sent to Melbourne from Moama alone. Some paddle steamers were dedicated to commercial fishing, with individual operators using 200 drum nets (Rowland, 1989, 2005). In NSW 'fixed engine' fishing was practiced. This is the official term for the use of 'springers' which employed a baited hook on a length of chord attached to a sapling. One account recorded springers placed every ten metres along one

river (*Argus,* 21 March 1914). While the catch of cod underwent a significant general decline in NSW after the 1920s, there were brief subsequent peaks as in 1955-6 when over 130 tonnes was taken. The inland commercial fishery in NSW was closed in 2001 (Rowland, 1989, 2005).

The oral history indicates that, even though some other native fish species were considered to be superior angling fish, Murray cod were the most sought after species by recreational fishermen in the Murray-Darling Basin. This was due to the challenge they offered by their size, their willingness to take the 'aeroplane' spinner and later other lures, and their good table qualities. There is evidence that in some rivers, in north eastern Victoria and southern NSW, Trout cod were more sought after than Murray cod, but even in these cases a large Murray cod was still considered to be a prized catch. On a weight for weight basis they typically were not considered to be a good fighting fish, particularly if taken on bait or 'springers', though anglers often recalled individual fish that were exceptions. On artificial lures they were considered to provide better sport and big fish that regularly broke anglers' lines such as 'Boughyards Annie' and 'Goulburn Jack' became legendary. The species was generally popular as a table fish, with its large size allowing it to be prepared as steaks rather than fillets. In the oral history smaller specimens were universally popular for consumption, with some people finding the fat in larger fish unappealing.

The association of Murray cod with the inland has always been strong. Wedlick (1974) wrote 'There is an attraction about cod fishing that is typically Australian, and this is felt perhaps even more as one sits on the bank of these big swirling cod streams under the towering redgums'. The Murray cod is an icon of the Murray-Darling Basin and Rowland, in a paper presented at a workshop on managing cod, concluded 'It is undoubtedly *the fish* in the hearts and minds of all Aboriginal and white inland Australians, and is an integral part of our culture' (Rowland, 2005).

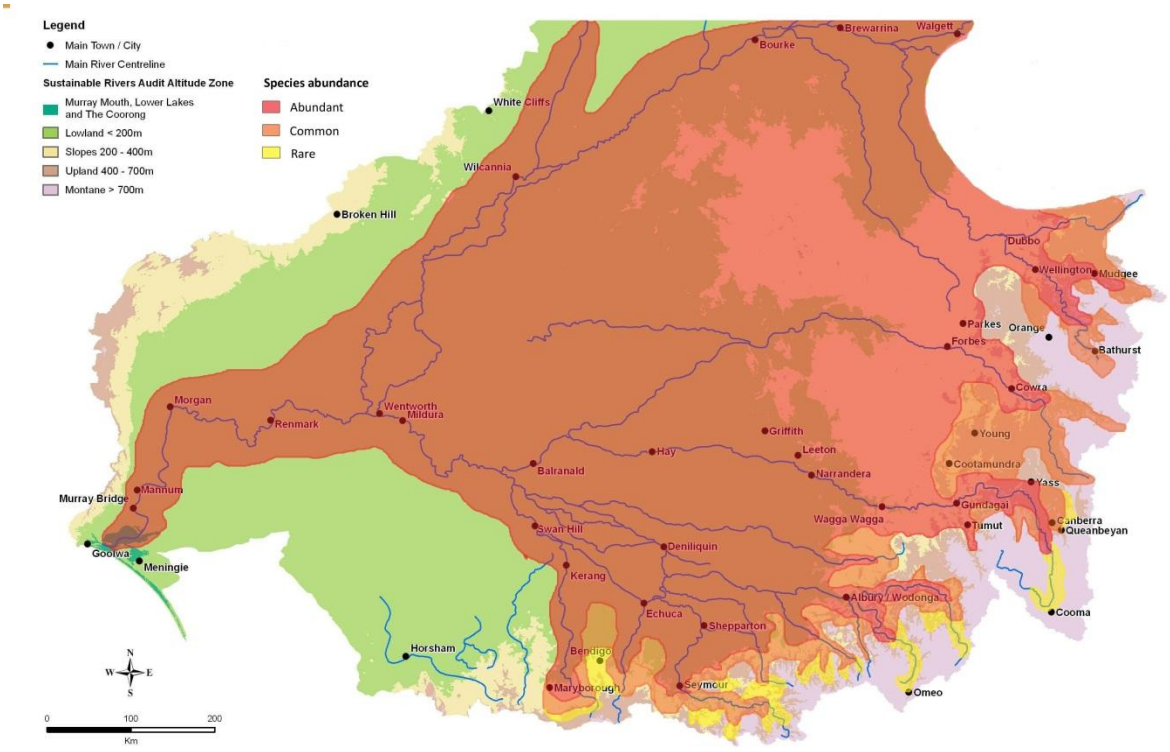
23.2.8 Decline & Current Status

Concern was expressed for the future of Murray cod as early as the 1880s in NSW (NSW Government, 1880). Similar concern in South Australia resulted in a detailed review of the fishery in 1900 (NSW Government, 1903). There is evidence that while the species remained widespread and common in lowland areas, a decline had occurred by 1900. The historical evidence indicates that early declines in the abundance of Murray cod had transpired in some non-lowland waters in the nineteenth century such as the Murrumbidgee River by the 1850s (*Sydney Morning Herald*, 31 January 1877) and the Yass River by the 1890s (*Yass Courier,* 11 February 1898). Murray cod had undergone a serious decline in abundance in the slopes zone in most catchments in Victoria by 1930, as well as in the slopes zone of the Murray and Murrumbidgee Catchments, and the upland zone generally in NSW by that time.

By the 1940s the oral history recorded a decline in catches of Murray cod generally throughout the lowland zone in the area studied. The species had further declined in the lowlands by the 1960s, particularly in Victoria. Today Murray cod remain widespread and reasonably common in many lowland waters, but are scarcer in the rivers further upstream in the southern half of the Basin. Anglers have, in areas such as the Central Murray River, reported a significant improvement in cod numbers since the 1970s and extensive stocking of hatchery produced fish has created some important fisheries in upland impoundments.

Nationally Murray cod are listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999.* In Victoria they are listed as threatened under the *Flora and Fauna Guarantee Act 1988*. In the ACT, NSW and Victoria, Murray cod can still be taken by anglers but are subject to size and bag limits, and closed seasons. In South Australia a no-take of Murray cod was introduced by regulations under the *Fisheries Act 2007* to protect the population during the recent drought. A national recovery plan for Murray cod has been prepared (National Murray Cod Recovery Team, 2010).

Figure 23.2 **A Reconstruction of the Historical Distribution & Abundance of Murray Cod in the Southern Murray-Darling Basin**



23.3 Golden Perch, *Macquaria ambigua*

THE GOLDEN PERCH.

The golden perch or yellowbelly (Plectroplites ambiguus) is to the inhabitants of the western country in New South Wales what the bass (percolates fluviatilis) is to the residents on our coastal streams, having a very wide geographical distribution—it is found throughout the whole of the Murray River system (also over practically the whole of Western Queensland), where it provides a valuable item for the menu. It seems to have a preference for the normally quiet waters of lagoons and billabongs, where it grows to a size of fully 12lb. Whenever a fresh occurs in the rivers and creeks, the yellowbelly avails himself of the opportunity to travel upward, and seeking the quieter waters penetrates miles from the main streams into tanks and dams, etc., wherever deep, still, water is to be found.

In such streams as the Bokhara, Narran, etc., every drought (and, unfortunately, droughty conditions there are of frequent recurrence) causes the water to dry up in the smaller pools, and thousands of golden perch die year after year, sometimes from lack of oxygen in the stagnant water, or through its pollution by stock, yet the following season, provided a good fresh comes down to fill all the holes and run the creeks through, they will be re-stocked as plentifully as ever.

Sydney Morning Herald, 25 June 1913

THE GOLDEN PERCH

The golden perch or yellowbelly (Plectroplites ambiguous) is to the inhabitants of the western country in New South Wales what the bass (percolates fluviatilis) is to the residents of our coastal streams, having a very wide geographical distribution – it is found throughout the whole of the Murray River system (also over practically the whole of Western Queensland), where it provides a valuable item for the menu. It seems to have a preference for the normally quiet waters of lagoons and billabongs, where it grows to a size of fully 12lb. Whenever a fresh occurs in the rivers and creeks, the yellowbelly avails himself of the opportunity to travel upward, and seeking the quieter waters penetrates miles from the main streams into tanks and dams, etc., wherever deep, still, water is to be found.

In such streams as the Bokhara, Narran, etc., every drought (and, unfortunately, droughty conditions there are of frequent recurrence) causes the water to dry up in the smaller pools, and thousands of golden perch die year after year, sometimes from lack of oxygen in the stagnant water, or through its pollution by stock, yet the following season, provided a good fresh comes down to fill all the holes and run the creeks through, they will be re-stocked as plentifully as ever.

23.3.1 European Discovery

In 1834 Bennett (1834) wrote of his experiences on the Murrumbidgee River near Yass and Gundagai. He described a fish called 'perch' by the colonists that was up to 20 inches long and 'was inclining to bronze; the ends of the scales being black, gave to the fish a checkered appearance'. The description provided by Bennett suggests that the perch was most likely Golden perch. Mitchell, during his exploration of the Barwon, Lachlan and other rivers during the 1830s, failed to mention the presence of Golden perch. Richardson (1845) published the first formal description and illustration of the species in 1845, based on specimens collected by Captain Grey, incorrectly reporting that they were found in West Australia.

Photograph 23.6 The First Golden Perch

In 1845 Sir John Richardson published the first taxonomic description of the Golden perch naming the species *Datnia ambigua* though leaving open the possibility that the species might be placed in the genus *Dules.* This illustration of the specimen returned to England was also published. Image reproduced from Plate 19, *Ichthyology of the voyage of H. M. S. Erebus and Terror, under the command of Captain Sir James Ross,* from the collection of the *National Library of Australia*.

23.3.2 Aboriginal Names

Bennett (1834) recorded that the 'perch' described by him from the Murrumbidgee River in the Yass/ Gundagai area were known by the local aboriginal people, probably the Ngunawal, as 'Kupé'. Other aboriginal names reported for Golden perch include 'Tarkee' (Ngarrindjeri) and 'Colubco' (Morunde) in South Australia (*Argus,* 19 September 1848; *Adelaide Observer*, 25 November 1865; Zeitz, 1902), 'Birnett' in the lower Loddon (Wemba Wemba) and 'Pollungunder' in the Gunbower area (Baraba Baraba) (Blandowski, 1858), and 'Kaakaalain' in the Murrumbidgee (Ogilby, 1893). Baylis recorded the name for 'yellow-bellied perch' in the

Wagga Wagga area as being 'googoolin' or 'kookalin' in the Wiradjuri language (Wesson, 2001). Mathews (1904) recorded 'Bidyin' as the Wiradjuri name for the species and he reported the use of this term for this species in a number of other nearby languages in various publications. This term is the identical to the aboriginal name recorded for Silver perch in 1832 by Mitchell (1838). At no time did Mitchell record catching Golden perch in his expedition suggesting that Bidyin may in fact have applied to Silver perch and the independent accounts of Ogilby and Baylis suggest also that 'Bidyin' did not apply to Golden perch. The terms 'Kongoopna, Kongoopka, Gangupka or Congupna' referred to 'perch' in the Shepparton area (Wesson, 2001), and may have been the Ngurai-illam wurrung name for the species. Matthews (1909) recorded 'Murroanba' (pronounced 'Murruwanba') as the term for 'perch' in the language of the Dhudhuroa of the upper Murray River which may have referred to Golden perch.

23.3.3 European Names

Richardson (1845) experienced difficulty in deciding into which genus to place Golden perch providing two names, *Datnia ambigua* and *Dules ambigua*. Gunther (1859) confirmed Richardson's description, placing the species in the genus *Dules*. Several other descriptions were published for Golden perch, variously naming the species *Tilka wilsonia, Ctenolates macquariensis, Dules auratus, Dules flavescens, Ctenolates ambiguous* and *Ctenolates flavescens* (Boulenger, 1895), and for many years it was known as *Plectroplites ambiguous.* MacDonald (1978), based on analysis of electrophoretic data, placed Golden perch in the same genus as Macquarie perch and it has subsequently known as *Macquaria ambigua*.

Golden perch are also found outside the Murray-Darling Basin in the Lake Eyre and Fitzroy Basins. It has been suggested that those present in the Lake Eyre Basin constitute a separate species while those in the Fitzroy Basin may be a sub-species of *Macquaria ambigua* (Musyl & Keenan, 1992). Recent genetic research has suggested that *Macquaria ambigua* originated in the coastal Fitzroy Catchment in Queensland and crossed the Great Dividing Range approximately 1.5 million years ago to colonise the Murray-Darling Basin and subsequently the Bulloo Catchment and Lake Eyre Basin. It has been recommended that Golden perch in the Fitzroy River Basin be recognised as a new species separate to *Macquaria ambigua* (Faulks *et al,* 2010).

The name 'Golden perch' was in use by 1845 (Beveridge, 1889; *Argus,* 18 September 1853) and adopted as the 'official' common name for the species at a conference of fisheries managers in 1947 (Roughley, 1955). Descriptions in the mid-nineteenth century of a fish known as 'cockerling' or 'cockerill' in the Barmah area suggest that these were early names for Golden perch which have long since fallen out of use (*Sydney Morning Herald,* 14 November 1868). The popular colloquial name 'yellowbelly' was in use by 1880 (NSW Government, 1880) and the South Australian name 'callop' has also been used in many references as well as 'Murray perch' under which name it was marketed commercially (Roughley, 1951).

23.3.4 Distribution and Habitat

Within the Murray-Darling Basin, Lintermans (2007) recorded Golden perch as being historically widespread and suggested that the species was generally found in the lowland, warmer, turbid, slow-flowing rivers but was also present in the mid reaches. During this project 167 locations were identified as the source of probable or certain historical accounts of captures of Golden perch and the collected evidence on the species abundance was used to develop rarity scores. The following table provides averages for the rarity scores created in each habitat zone in each catchment for Golden perch using historical evidence in this investigation:

Table 23.4 Golden perch Average Rarity Scores

	Zones			
Area	**Lowland**	**Slopes**	**Upland**	**Montane**
NSW & ACT	4.8	3.6	1.0	0.1
VIC	4.0	0.8	0.0	0.0
SA	5.0			
Basin	4.6	1.8	0.4	0.1

The average rarity scores suggest that in NSW Golden perch were abundant in the lowland zone (4.8) and very common in the slopes zones (3.6), rare but regularly captured by anglers in the upland zone (1.0) and occasionally penetrated into the montane zone (0.1). The presence of Golden perch in the upland zone in NSW is not universal as they have not been reported from this zone in the Upper Murray Catchment. Oral accounts suggest that in the Macquarie, Lachlan and Murrumbidgee Catchments, the species was usually fairly rare in the upland zone but after major floods it was reliably captured in small numbers. The low montane zone score reflects plausible oral accounts of Golden perch being occasionally taken in the Duckmaloi and Cudgegong Rivers in the lower reaches of this zone in the Macquarie Catchment.

In Victoria the average rarity scores suggest that Golden perch were moderately abundant in the lowland zone (4.0) though in some areas, such as the lower Ovens River, they were common but not abundant. Golden perch were regularly taken but comparatively rare in the slopes zone in Victoria (1.0). There is evidence that at times they were fairly common at the bottom of the slopes zone near Wangaratta in the Ovens River, and Seymour in the Goulburn River, with one account implying regular captures upstream to Whitfield in the King River (*Argus*, 22 August 1936). Generally captures appear to have been restricted to small numbers of fish. A single oral account suggested that a few specimens were taken in the upland zone of the Goulburn River after the filling of the first Eildon Weir, but at best in Victoria it appears that Golden perch were vagrants in the upland zone. The average rarity score of 5.0 for South Australia indicates that the species was abundant throughout the lower Murray River.

Along the lower Murrumbidgee, Golden perch were reported to be one of the most common species taken from lagoons (*Argus,* 10 August 1917; Anderson, 1918) and were also very common in lagoons and lakes in western Victoria (Beveridge, 1889). From the Goulburn River east in Victoria there are good accounts of Golden perch being present in lagoons, but generally Macquarie perch were more abundant in this habitat. In the upland zone in NSW Golden perch were reported mainly from the larger rivers and not from creeks.

In conclusion the collective results for the Basin suggest that Golden perch, on average, were most abundant in the lowland zone (4.6) with a modest presence in the slopes zone (1.8) though steadily increased in abundance in the slopes zone northwards. They appear to have been primarily a lowland species and billabongs and lakes were often reported to have held large numbers. The historical evidence suggests that of the larger fish species Golden perch had the lowest presence in the non-lowland habitats of the Murray-Darling Basin. They were very rare in the upland zone south of the Murrumbidgee Catchment and while regularly taken in this zone in the Macquarie, Lachlan and Murrumbidgee Catchments were never reported to be particularly common with their presence in numbers being linked to major flood events. The altitude record for Golden perch appears to be about 750 m ASL at the junction of the Fish and Duckmaloi Rivers, where they were recorded in oral history to have been present in the early twentieth century.

23.3.5 Translocations

A number of early attempts were made to translocate Golden perch outside of the Murray-Darling Basin including to the Hunter River (*Maitland Mercury & Hunter River General Advertiser*, 3 October 1885), and to Tasmania, Western Australia and England (*Hobart Mercury,* 14 August 1862, 13 November 1911; *Riverine Herald,* 17 February 1864, 23 February 1864). In most cases these early translocations failed to establish long term populations. Golden perch were probably included in shipments of fish to the Wimmera Catchment between 1861 and 1910 but are known with certainty to have been liberated in 1933 (NSW Fisheries Report, 1933) and to have become established by 1950 (Cadwallader, 1977). They were probably translocated to the Avoca River in 1870 (*Riverine Herald,* 9 March 1870) with captures occurring after that time (*Argus,* 14 April 1873; Cadwallader, 1977). Golden perch in the 1920s were translocated from Euston on the Murray River to Chifley Dam near Bathurst (Lake, 1959), an area which was probably outside of their natural range. Since the 1970s Golden perch have been stocked into other waters outside of their natural range, with some evidence of populations becoming established in areas including coastal catchments in Victoria (Faulks *et al,* 2010).

23.3.6 Size

The largest Golden perch was reported by Roughley (1955) as having been caught by professional fisherman William Davies from the Picanniny Creek area of Kow Swamp in Victoria in February 1938 and weighed 54 lb. (24.6 kg) cleaned. A receipt for the sale of the fish to a Melbourne fish agent survives supporting the account and a number of elderly residents in the Cohuna area recall seeing a photo which appears to have been lost. Roughley (1955) quoted NSW Fisheries inspector Arnold Arentz as having weighed a fish of just over 42 lb. (19.1 kg) caught in the Murrumbidgge River near Wagga Wagga. Arentz also reported the capture of a 22½ lb. (10.2 kg) Golden perch from a lagoon twenty miles north west of Goondiwindi in January 1950. Fish from 17 to 28 lb. (7.7 to 12.7 kg) were also reported from lakes and swamps in Victoria, probably near Swan Hill where Arentz was based (Roughley, 1951). Newspaper accounts suggest that in the early days a 10 lb. (4.6 kg) fish was considered to be a large example. The species is capable of very rapid growth, at least the females. In a farm dam near Alexandra Golden perch stocked in 1975 reached a maximum of 19 lb. (8.6 kg) after five years, with many females around the 12 lb. (5.5 kg). The largest male weighed only 3 lb. (1.4 kg) (Author's pers. obs.).

23.3.7 Community Use

Golden perch were an important component of the former inland commercial fishery from an early date, coming into prominence as cod catches declined. In 1948-49 the catch of Golden perch in NSW amounted to 60,623 lb. (27,556 kg) being 34% of the catch of Murray cod and by the 1950s Golden perch comprised 50% of the total catch of the NSW inland commercial fishery (Roughley, 1955). Although overshadowed in popularity by cod, in the lowland rivers Golden perch were a popular target of recreational anglers. They were considered to provide reasonable sport both on bait and lures, though they gained a reputation of being fickle targets. More than one angler interviewed suggested that they were relatively easy to catch when a river was rising but were a difficult quarry during stable water and impossible when a river was falling.

Golden perch were considered to be a good table fish, some people preferring them to cod considering the perch to be less fatty. As a consequence of its good table qualities, from an early date there was an interest in its artificial propagation. In 1880 a resident at Wagga Wagga was suppling Golden perch eggs, which were presumably sourced from the wild (NSW Government, 1880). Artificial propagation was accomplished at Berembed Weir in 1916 by H. K. Anderson utilising wild fish (NSW Fisheries Report, 1916). Reliable technology for their production using captive fish did not eventuate until the 1970s but Golden perch was the first native

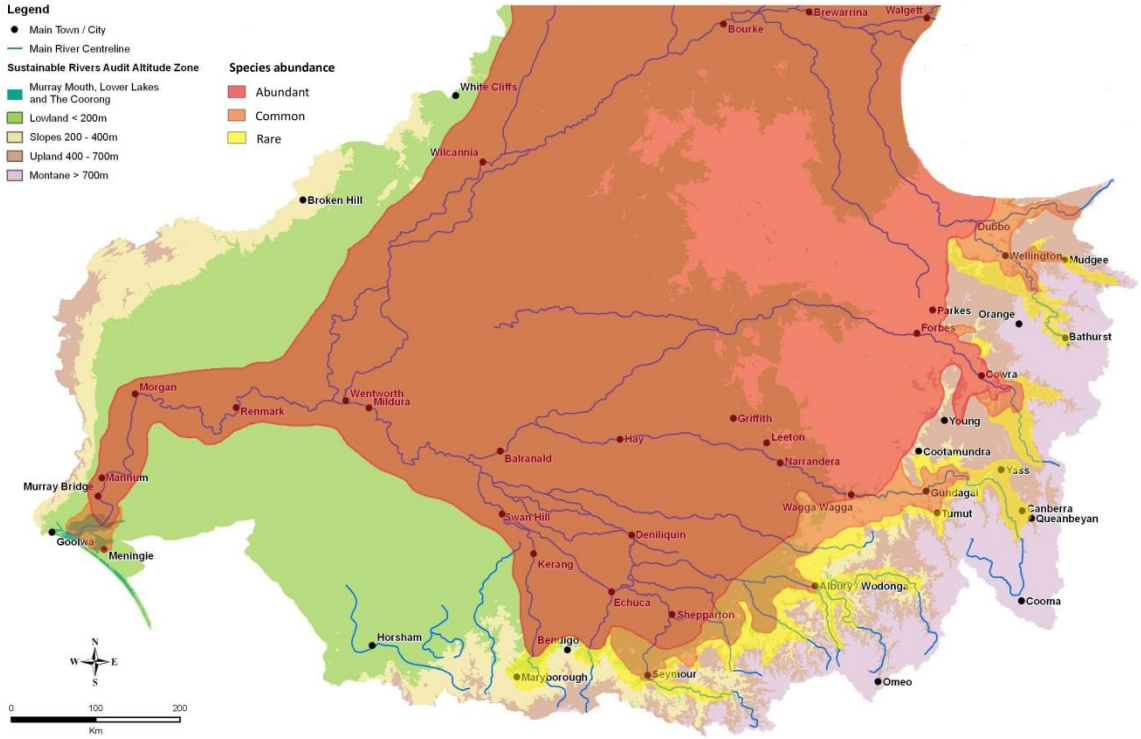
species that became available in large numbers for stocking. To many people of the inland, the humble 'yellowbelly' was the staple of their angling efforts and it had many admirers, with Bill Inward of Dubbo recalling his impression on first seeing one: 'I remember what a magnificent fish the yellowbelly was, the first one I saw'.

23.3.8 Decline & Current Status

While still common in many areas of the lowlands throughout the Murray-Darling Basin, wild populations of Golden perch have largely disappeared from the slopes and upland zones, particularly in the south of the Basin. Lake (1959) reported that Golden perch disappeared upstream of Wyangala Dam on the Lachlan River, Burrinjuck Dam on the Murrumbidgee River, and Yarrawonga Weir, after the construction of these barriers in the first half of the twentieth century. Langtry (Cadwallader, 1977) concluded that a serious decline had occurred in commercial catches of Golden perch in lakes in north-west Victoria by 1949 and Roughley (1955) reported that Golden perch had become 'seriously depleted' in the Murray River, with a lesser decline evident elsewhere in NSW. The historical evidence indicates that declines occurred in the slopes zone in Victoria also after the construction of weirs. Examples include the middle Goulburn River after the completion of the Goulburn Weir in 1891, and the Ovens River after the Yarrawonga Weir was constructed in 1939.

Extensive stocking of hatchery produced fish since the mid-1970s has established populations in many upland impoundments in areas where the species was historically uncommon, but these generally are not self-supporting. Golden perch have undergone a significant reduction in abundance particularly upstream of the lowlands within its former natural distribution in Victoria. As a consequence in Victoria the remaining wild populations are listed as vulnerable under the *Flora and Fauna Guarantee Act 1988*. In the other states Golden perch have undergone a reduction in abundance, but are not at present considered threatened. They can be taken by anglers in all states.

Figure 23.3 **A Reconstruction of the Historical Distribution & Abundance of Golden Perch in the Southern Murray-Darling Basin**



23.4 Silver Perch, *Bidyanus bidyanus*

MURRAY SILVER PERCH.

I am not very familiar with the ways of the fish called silver perch or "grunter" in the Murray. I was under the impression that it was a Lower Murray fish, but noticed last autumn that some good bags were got above the junction with the Goulburn.

In fishing for them I would suggest that M. F. Ilford try other methods than those used for either cod or Macquarie perch. Have fine tackle with a gut bottom, and wood grubs for a bait, if they are to be got. You find silver perch often in swift water, and, with the river low, I would fish at the foot of a current. Cast as far as possible upstream, and let the current carry the bait down. After a few casts in one spot it is desirable to use trout fishers' methods, and try other water.

Argus, 21 February 1928

MURRAY SILVER PEARCH

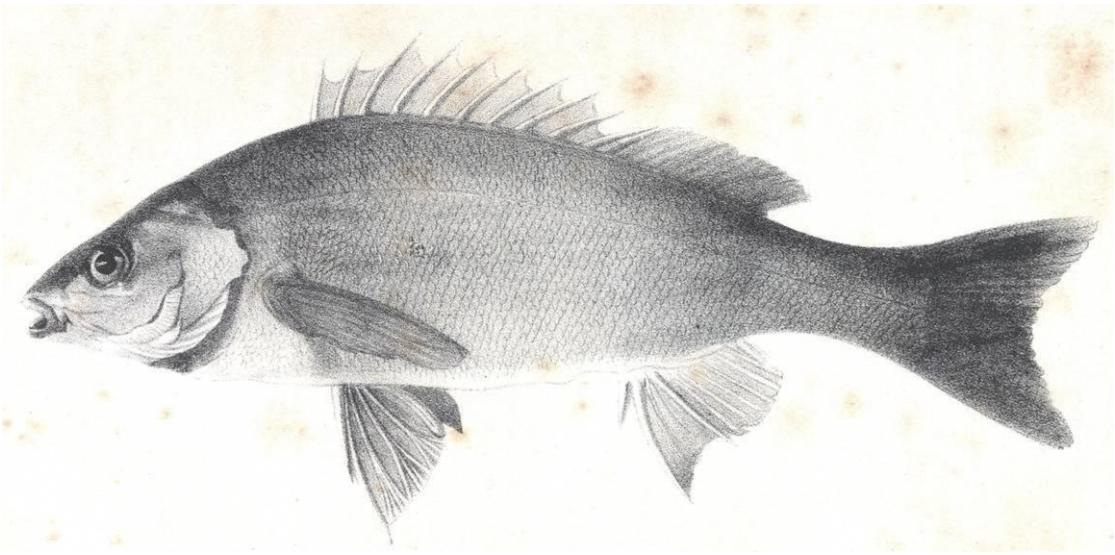
I am not very familiar with the ways of the fish called silver perch or ”grunter” in the Murray. I was under the impression that it was a Lower Murray fish, but noticed last autumn that some good bags were got above the junction with the Goulburn.

In fishing for them I would suggest that M. F. Ilford try other methods than those used for either a cod or Macquarie perch. Have fine tackle with a gut bottom, and wood grubs for a bait, if they are to be got. You find silver perch often in swift water, and, with the river low, I would fish at the foot of a current. Cast as far as possible upstream, and let the current carry the bait down. After a few casts in one spot it is desirable to use trout fishers’ methods, and try other water.

23.4.1 European Discovery

In 1828 Sturt (1833) recorded the capture by the local indigenous people of 'Seven fine bream' from the Macquarie River near Trangie which were probably Silver perch. The first unambiguous account of Silver perch was provided by Mitchell who described and illustrated specimens he caught from the Barwon River in January 1832: 'We soon found that this river contained fish in great abundance, and of three kinds at least: viz. first, a firm but coarse-tasted fish, having strong scales; this made a groaning noise when on the hook' (Mitchell, 1838).

Photograph 23.7 The First Silver Perch



An illustration drawn by Major Thomas Mitchell of a Silver perch captured from the Barwon River in January 1832. He named the species *Cernua Bidyana mihi* (Mitchell, 1839). Image reproduced with permission from the collection of the *State Library of Victoria.*

23.4.2 Aboriginal Names

Mitchell (1838) recorded the term 'Bidyan' as the local aboriginal name for Silver perch in the Barwon River, suggesting a Yuwaalaraay or Gamilaraay origin. R. H. Mathews recorded 'Bidyin' as the name for Golden perch in the Wailwan language (immediately to the south of the Yuwaalaraay or Gamilaraay people) with 'bream' and 'silver bream' as 'Bunngulla' and 'Birunge' in the Wailwan language in various publications. Mitchell did not record catching Golden perch during his expedition and as the actual fish he illustrated as a 'Bidyan' was named as such by local aborigines at that time it seems more likely that 'Bidyan' or 'Bidyin' applied to Silver perch than Golden perch. 'Kubery' or 'Kooberry' was recorded by a number of authors in the nineteenth century as being used by aborigines specifically for 'Silver perch' or 'grunter' in the central Murrumbidgee area, predating Mathews' accounts, suggesting that this was the Wiradjuri name for the species (NSW Government, 1880; Tennison-Woods, 1882; Wesson, 2001). Other aboriginal names recorded for Silver perch include 'Toorroo' (Morunde), 'Teheeree' and 'Cheerey' (Ngarrindjeri) in the lower Murray (*Argus,* 19 September 1848; Zeitz, 1902; Stead, 1903). Blandowski (1858) recorded several names used by the Yaree Yaree people in the Merbein area, the individual terms relating to the size of the fish these being 'Bagguck' and 'Karpa' for the larger individuals and 'Buruitjall', and 'Bipe Purritjall' for the juveniles.

23.4.3 European Names

Mitchell (1838) named the specimens he captured from the Barwon River *Cernua Bidyana mihi*. In 1846 Richardson published a description for the species naming it *Datnia ellipticus* and reporting it to have been collected from Western Australia (Richardson, 1846). Gunther (1859), based on a comparison of the skin of a fish collected from the Namoi River and Richardson's specimen, concluded that they represented the same species but in another genus, naming it *Therapon ellipticus* (Gunther, 1859). Several other synonyms were published for Silver perch including *Therapon richardsonii, T. Niger* and *T. Macleayanus* (Ogilby, 1893) while Blandowski (1858) provided a number of names including *Cernua bidyana, C. Eadesii, C. Nicholsonia, C. Ifflaenisis and C. wilkiensis*. Ultimately the species was placed in a new genus and is now known as *Bidyanus bidyanus* (Paxton *et al.,* 1989).

The characteristic grunting noise made by the fish as described by Mitchell (1838) was eventually popularised in the descriptive colloquial name 'grunter'. This name is still widely used, along with the ubiquitous silver or black bream (Lake, 1959) and Silver perch, the latter of which was in use by 1845 (Beveridge, 1889).

23.4.4 Distribution and Habitat

Lintermans (2007) recorded Silver perch as being historically widespread throughout the Basin, though in Victoria it was rarely recorded upstream of the lowlands. He suggested that the species was generally found in turbid, slow-flowing rivers and were absent from the upper reaches. During this project 148 locations were identified as the source of probable or certain historical accounts of captures of Silver perch, and the collected evidence on the species abundance was used to develop rarity scores. The following table provides averages for the rarity scores created in each habitat zone in each catchment for Silver perch using historical evidence in this investigation:

Table 23.5 Silver perch Average Rarity Scores

	Zones			
Area	**Lowland**	**Slopes**	**Upland**	**Montane**
NSW & ACT	4.8	4.4	2.9	0.4
VIC	4.0	1.0	0.1	0.0
SA	5.0			
Basin	4.6	2.3	1.0	0.2

The average rarity scores suggest that in NSW Silver perch were abundant in the lowland (4.8) and slopes zones (4.4), common in the upland zone (2.9) and occasionally penetrated into the montane zone (0.4). The presence of Silver perch in the upland zone is not universal as they have not been reported from this zone in the Upper Murray Catchment. Newspaper and oral accounts recorded that in the upper Murrumbidgee there was an annual migration into the upland zone suggesting that, although there were some resident fish, to some degree Silver perch abundance fluctuated seasonally. In the upland zones of the Macquarie and Lachlan Catchments there is good evidence that Silver perch were common throughout the year. The low montane score reflects a transient presence in this zone during upstream migration in the Murrumbidgee Catchment and possibly the Macquarie Catchment.

In Victoria the average rarity scores suggest that Silver perch were very common in the lowland zone (4.0) and regularly taken but comparatively rare in the slopes zone (1.0). Their reported presence in the slopes zone was linked to migrations with occasional penetration (0.1) into the lower reaches of the upland zone such as the Mitta Mitta River at Dartmouth. Silver perch are unreported from the montane zone in Victoria. The average rarity score of 5.0 for South Australia indicates that the species was abundant throughout the lower Murray River.

Silver perch were reported by Jarman (*Argus,* 11 August 1922) as being less abundant in lagoon habitats than the main river and creek channels, and this view has been supported by some anglers. There are, however, examples where significant numbers were taken from lagoons such as the 'Natures Waste' translocation activities along the Murrumbidgee River (Anderson, 1918), and they were fairly common in lagoons along the lower Goulburn River (Polkinghorne, OH 131). In the lowland rivers anglers consistently reported Silver perch to be more prevalent in areas of flowing water rather than the quieter backwaters. Further upstream in the slopes and upland zones, Silver perch were reported mainly from the larger rivers and not from creeks. Anglers generally reported a greater presence of Silver perch than Golden perch in non-lowland zones, particularly in the upland zone.

In conclusion the collective results for the Basin suggest that Silver perch, on average, were most abundant in the lowland zone (4.6) with a significant presence in the slopes zone (2.3). They were rare in the upland zone south of the Murrumbidgee but progressively increased in abundance in this zone northwards. The altitude record for the species exists in the Murrumbidgee and Numeralla Rivers near Chakola at the bottom of the montane zone at an altitude of about 700 m ASL.

23.4.5 Translocations

Silver perch were sometimes included in translocation shipments to waters outside of the Murray-Darling Basin. The most notable example of this was the shipment to the Nepean River and Cataract Reservoir in 1916 (NSW Fisheries Reports, 1914; 1923), where they continue to exist in the latter as a self-supporting population. A translocation from the Namoi River to the Hunter River resulted in a population becoming established near Singleton (*Maitland Mercury & Hunter River General Advertiser*, 3 October 1885). While they were introduced to the Yarra River in the early twentieth century (*Argus,* 24 February 1911), they failed to establish. Since the 1970s hatchery produced Silver perch have been stocked into a number of waters outside of their natural range, in some cases establishing populations (Clunie & Koehn, 2001a).

23.4.6 Size

The largest Silver perch reliably recorded was taken in April 1836 by Mitchell from the Goobang Creek near Condobolin and weighed 17 lb. (7.7 kg) (Mitchell, 1838). A newspaper account of an 18 lb. (8.2 kg) 'Macquarie perch' taken from the Merran Creek is probably a description of an extremely large Silver perch, possibly a record (*Argus,* 18 July 1924). Jarman reported taking a specimen weighing 17 lb. (7.7 kg) from the Coonang Creek near Jerilderie (*Argus,* 11 August 1922). Many anglers recalled the species as being formerly common up to around three kilograms, but it is clear that from time to time much bigger fish were taken.

Many oral accounts recall Silver perch to have formed large schools, and both recreational and commercial fishermen suggested that the species undertook migrations. At times Silver perch filled drum nets making them impossible to lift from the water due to the weight of the fish (Laddie Clifford, pers. com.).

23.4.7 Community Use

It was reported that Aboriginal people along the lower Murray River in Victoria had a cultural belief that people from visiting tribes could not touch, smell or eat the cooked flesh of Silver perch for fear of serious spiritual punishment. This privilege was not bestowed to other species such as cod, indicating the esteem in which they were held (*Argus,* 30 March 1850). While secondary in importance to cod and Golden perch, Silver perch were an important part of the inland commercial fishery, particularly in later years as cod declined in abundance. In 1948-49 about 14,472 lb. (6578 kg) of Silver perch were officially recorded as taken in NSW and significant quantities were also taken in South Australia (Hammer *et al.,* 2007).

Mitchell observed a variability in eating quality, noting that the fish he ate from the Barwon River were 'coarse and tasted of mud' whereas those from the Goobang Creek were 'rich and of excellent flavour' (Mitchell, 1838). Mitchell's observations were repeated by a number of anglers in the oral history, with Silver perch being sometimes highly regarded, with others considering it a poor eating fish, often exhibiting a strong weedy or muddy flavour.

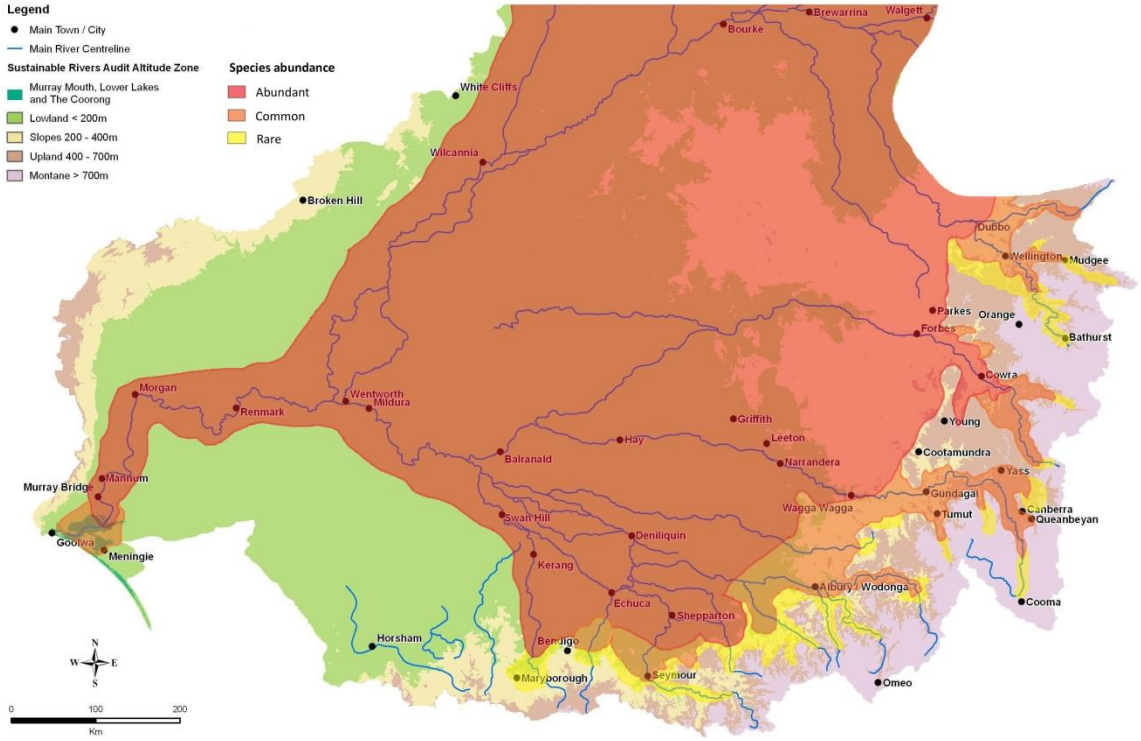
While some anglers considered small Silver perch to be a nuisance, stealing bait intended for cod, larger specimens were universally regarded as providing excellent angling, and were probably second only to Trout cod in fighting ability. Today Silver perch have come to prominence as an important aquaculture species with artificial feeds making them highly regarded as a table fish, now being cultured widely overseas. While often overshadowed by Murray cod and Golden perch, historically Silver perch made an important contribution to the inland recreational fishery and had many admirers. Tennison-Woods, in evidence presented to the NSW Royal Commission on Fisheries in 1880 concluded that 'the 'Silver Perch' or 'Bream' (*Therapon richardsonii*) is the perfection of fishes, extremely rich and delicate in flavour' (Tenison-Woods, 1882).

23.4.8 Decline & Current Status

The historical evidence indicates that Silver perch declined in slopes habitats in Victoria after the 1920s and had become scarce in the Central Murray Catchment downstream to Yarrawonga by the 1930s, with some evidence of decline in other areas by the 1940s. The oral history indicates that since the 1950s they have drastically declined in abundance in the upland zones of the Macquarie, Lachlan and Murrumbidgee Catchments. The number of individuals moving through the Euston Weir fishway in the Central Murray River decreased by 93% between 1939 and 1992 (Mallen-Cooper, 1993) and the species has become scarce in many areas, with the most significant remaining wild population being in the Central Murray River and nearby streams below Yarrawonga. They have been stocked in many impoundments in the past with varying degrees of success (Clunie & Koehn, 2001b; NSW Department of Primary Industries, 2006b).

In NSW Silver perch are listed as vulnerable under the *Fisheries Management Act 1994;* in the ACT it is classified as endangered under the *Nature Conservation Act 1980*; in Victoria they are listed as threatened under the *Flora and Fauna Guarantee Act 1988*. In South Australia Silver perch are considered endangered, and cannot be taken by anglers, having been protected by regulations under the *Fisheries Act 2007.* In the southern half of the Basin Silver perch are now totally protected in rivers and streams. They can, however, be taken from a limited number of impoundments where they are stocked, from private dams and can be sold by aquaculture operations.

Figure 23.4 **A Reconstruction of the Historical Distribution & Abundance of Silver Perch in the Southern Murray-Darling Basin**



23.5 Macquarie Perch, *Macquaria australasica*

AFTER MACQUARIE PERCH.

A GOULBURN MORNING.

By DONALD MACDONALD.

From midnight on Thursday the perch of the Goulburn River were no longer given sanctuary or the right of way. It was the opening morning of the fishing season at the great Nagambie weir on the Goulburn, and while it was yet dark some two hundred fishermen from all over the Valley, and some carloads of enthusiasts from the city, were waiting their opportunity for first go at the Macquarie perch—with an occasional cod or catfish to vary the bag. The opening day at the weir—which is so fine a memorial to its builder, the late Mr. Stuart Murray, the keystone also of all the irrigation of the north—is the means for a fisherman's festival, which grows greater, more restful, less resistible year by year. There will be fishing there aplenty all through the summer; the opening day is being celebrated all along the river, but Nagambie weir is the early door. The rush for it recalls the ardour and excitement of the first morning of the duck season, with rather less of its explosiveness, for the night camps by the river are quiet, if keen, patient and expectant. By the twinkling of lanterns groups of fishermen are fitting and fixing rods and tackle hours before there is light enough to use them.

Argus, 3 December 1921

AFTER MACQUARIE PERCH

A GOULBURN MORNING

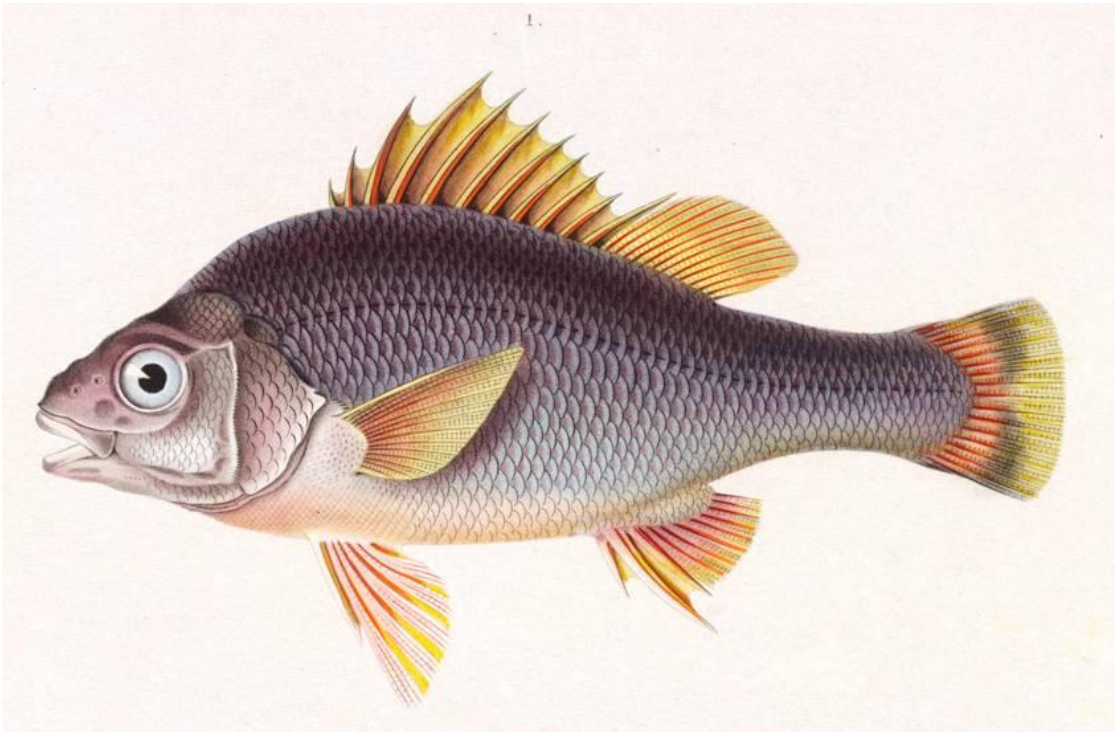
By DONALD MACDONALD

From midnight on Thursday the perch of the Goulburn River were no longer given sanctuary or the right of way. It was the opening morning of the fishing season at the great Nagambie weir on the Goulburn, and while it was yet dark some two hundred fishermen from all over the Valley, and some carloads of enthusiasts from the city, were waiting their opportunity for the first go at the Macquarie perch – with an occasional cod or catfish to vary the bag. The opening day at the weir – which is so fine a memorial to its builder, the late Mr. Stuart Murray, the keystone also of all the irrigation of the north – is the means for a fisherman's festival, which grows greater, more zestful, less resistible year by year. There will be fishing there aplenty all through the summer; the opening day is being celebrated all along the river, but Nagambie weir is the early door. The rush for it recalls the ardour and excitement of the first morning of the duck season, with rather less of its explosiveness, for the night camps by the river are quiet, if keen, patient and expectant. By the twinkling of lanterns groups of fishermen are fitting and fixing rods and tackle hours before there is light enough to use them.

23.5.1 European Discovery

Macquarie perch are likely to have been one of the first species encountered by Europeans when they crossed the Great Dividing Range, with Taylor (1823) writing the first account. He recorded the presence of a perch-like fish in the upper Macquarie Catchment. Cunningham (1825) used the term 'bream' to describe the fish, but the first unambiguous account is that of Lesson (1825) who captured the species at Bathurst in February 1824, and whose illustration confirms that the fish were Macquarie perch.

Photograph 23.8 The First Macquarie Perch



French naturalist Rene Lesson of the *Coquille* expedition provided the first definitive account of Macquarie perch, catching and eating specimens from the Macquarie River at Bathurst in February 1824. Lesson named the species *Macquaria australasiae* (Lesson, 1825), illustrated it in the zoological atlas of the expedition (Lesson, 1826) and returned a preserved specimen to France. Lesson never published a detailed description of the fish and it was ultimately Georges Cuvier who did so in 1830 based on Lesson's specimen and two forwarded to him by Thomas Hobbes Scott (Cuvier & Valenciennes, 1830). Image reproduced from Figure 1, Plate 14, *Voyage autour du monde execute par ordre du roi sur la corvette de La Majesté La Coquille, pendant les années 1822, 1823, 1824 et 1825. Histoire naturelle. Zoologie, Atlas* from the collection of the *National Library of Australia.*

23.5.2 Aboriginal Names

Many aboriginal names have been documented for 'perch' or 'bream' but the failure to provide sufficient detail to identify the species makes it unclear which applied to Macquarie perch. Baylis recorded the indigenous word for 'bream' in the Wagga Wagga area (Wiradjuri language) as being 'Nooraderri'. A different term, 'Kubery' or 'Kooberry', was used for grunter (Silver perch), the other candidate for 'bream' in the area

(Wesson, 2001; Tenison-Woods, 1882), suggesting that 'Nooraderri' may have referred to Macquarie perch. Mathews (1904) reported that the term 'Gubir' was used for 'black bream' in the Wiradjuri language, which may also have been a name for Macquarie perch. Matthews (1909) recorded the name 'Wunnumberu' for 'black bream' in the language of the Dhudhuroa who lived along the upper Murray River and the lower Kiewa and Mitta Mitta Rivers. As the only other candidate for 'black bream' in these rivers was Silver perch which were comparatively scarce, it is almost certain that 'Wunnumberu' (pronounced 'Wanambiyu') referred to Macquarie perch.

23.5.3 European Names

Lesson (1825) created the name *Macquaria australasiae* for the specimen he collected in 1824, but failed to publish a formal description for the species. Cuvier published a detailed anatomical description of the species. He based it on the specimen returned to France by Lesson, and on two forwarded to him by Thomas Hobbes Scott, naming it *Macquaria australasica* (Cuvier & Valenciennes, 1830). Over the years a number of naturalists described several different species of Macquarie perch separated by minor anatomical differences. These species included *Dules viverrinus, Dules christyi, Murrayia guentheri, Murrayia cyprinoides, Murrayia bramoides, Riverina fluviatilis, Murrayia riverina* and *Murrayia jenkinsi* (Boulenger, 1895), but none of these gained widespread recognition. Throughout the twentieth century only one species of Macquarie perch was recognised as *Macquaria australasica*.

Genetic research has indicated that populations of Macquarie perch present in the coastal Shoalhaven and Hawkesbury-Nepean Basins in NSW may be distinct species or sub-species. It also indicates that Macquarie perch originated in the Shoalhaven system and gained access to the Hawkesbury watershed via headwater swamps. About six hundred thousand years ago they crossed the Great Dividing Range to colonise the Murray-Darling Basin via either the Lachlan or Macquarie catchments. Three distinct genetic stocks of Macquarie perch in the Shoalhaven, Hawkesbury and Murray-Darling Basins are now recognised, with the suggestion the Shoalhaven fish should be recognised as a separate species (Dufty, 1986; Faulks *et al,* 2009).

Macquarie perch were commonly known as 'black bream' or 'perch' but other more specific names were utilised by anglers. Originally known in old references as Macquarie's perch and ultimately Macquarie perch, Ogilby (1913) recorded one name as being 'snubnose perch' while Stead (1913) used the alternative name of 'Mountain perch' for the species. Perhaps the most widely used specific name was 'white eyes' or 'white eyed bream' with old anglers from the Macquarie catchment south into Victoria employing it. It was a commonly used name in the oral history collected by Rhodes (1999) in north eastern Victoria, and was reported also by Lake (1959). Their prominent eyes also gave rise to the name 'goggle eyes' which was recalled by anglers from Hill End on the Macquarie to the Central Murray and Goulburn Rivers, and by one newspaper correspondent (*Argus,* 23 January 1923). Commercial fishermen along the Central Murray River marketed the species locally as 'butterfish'.

23.5.4 Distribution and Habitat

Within the Murray-Darling Basin, Lintermans (2007) reported Macquarie perch as being historically found from the Lachlan Catchment south, and typically found in the cool, upper reaches of the Murray-Darling Basin. The records he provided were concentrated in the slopes and upland zones with fewer records from the lowlands. Lake (1967b, 1971) described Macquarie perch as being found principally in the upper reaches, though not at the sources, of the rivers of the Murray-Darling Basin which has been repeated in most subsequent publications.

During this project 356 locations were identified as the source of probable or certain historical accounts of captures of Macquarie perch, and the collected evidence on the species abundance was used to develop rarity scores. More records were obtained for Macquarie perch than for any other individual species due to the extensive oral history collected in north eastern Victoria, and the numerous newspaper records in the Melbourne *Argus.* The following table provides averages for the rarity scores created in each habitat zone in each catchment for Macquarie perch using historical evidence in this investigation:

Table 23.6 Macquarie perch Average Rarity Scores

	Zones			
Area	**Lowland**	**Slopes**	**Upland**	**Montane**
NSW & ACT	2.5	4.1	4.6	4.1
VIC	3.9	4.9	2.4	0.9
SA	0.7			
Basin	2.6	4.6	3.2	2.5

The average rarity scores suggest that in NSW Macquarie perch were fairly common in the lowland zone (2.5), were moderately abundant in the slopes zone (4.1), abundant in the upland zone (4.6) and moderately abundant in the montane zone (4.1). The lowland score has been strongly influenced by the fact that while Macquarie perch were common to abundant in some lowland rivers such as the Murray and Murrumbidgee, they were rare or absent in others such as the lower Lachlan and Macquarie Rivers. Similarly the species was considered to be abundant in the slopes zone of all catchments except the Macquarie and Lachlan, with the latter two having a negative influence on the score in this zone. Most records in the montane zone originated from the lower reaches, though it is likely that in the Lachlan and Murrumbidgee Rivers that they were present close to the sources of these rivers. There is also some uncertainty in the score given to Macquarie perch in the montane zone of the Upper Murray Catchment, inferred from a newspaper account, and the species abundance in similar habitat in the adjacent Mitta Mitta Catchment. Overall the scores suggest that in NSW the species was strongly associated with the upland and slopes zones, had a significant presence in the lower montane zone, and in the lowlands progressively increased in abundance southwards.

In Victoria the average rarity scores suggest that Macquarie perch were moderately abundant in the lowland zone (4.1), abundant in the slopes zone (4.9), moderately common in the upland zone (2.4) and rare, but regularly taken, in the montane zone (0.9). The scores for the upland and montane zones have been influenced to some degree by the presence of waterfall barriers preventing access to these zones in some catchments such as the Campaspe. There are a number of catchments in Victoria where Macquarie perch were recorded as being very common to abundant in the upland zone including the Mitta Mitta and Goulburn. The records in the montane zone in Victoria originated from only the lower reaches, and the rarity scores should not be used to infer that they were generally present in this zone. Many good records exist describing Macquarie perch as being one of the most commonly captured species in lagoons in the slopes and lowland zones, and in some lowland rivers such as the Ovens and Goulburn they were abundant. It can be concluded that Macquarie perch was a widespread and common species in Victoria in most habitats below the montane zone, but was most strongly associated with the slopes zone. The average rarity score of 0.7 in South Australia reflects the limited records of Macquarie perch in that state. The available evidence suggests that the species was present in small numbers in the upper reaches of the Murray in South Australia, but further downstream was present only as vagrants.

The record provided by Lesson (1825), newspaper accounts and oral history, demonstrate conclusively that Macquarie perch were present in the Macquarie Catchment, extending their range northwards from that

generally reported. Anglers regularly report catching 'Macquarie perch' from the Darling River but these have always proved to be dark black specimens of Silver perch (Author's pers. obs.) and it is unlikely that Macquarie perch had more than a vagrant status in that river. There is no evidence to suggest the Macquarie perch were present north of the Macquarie catchment.

Macquarie perch extended well downstream into the lowlands from the Murrumbidgee Catchment south. In the Murray River near Burramine, Macquarie perch were the second most commonly taken species by Langtry in 1950 (Cadwallader, 1977), were regular captures in the Swan Hill area prior to the Second World War and many hundreds of fish passed annually through the Euston Weir fish ladder (Mallen-Cooper & Brand, 2007). Many tens of thousands of Macquarie perch were sourced from lowland habitat below the Goulburn Weir, and in the Broken River for translocation elsewhere (Cadwallader, 1981) and they were regularly captured from lagoons in the Bringagee area during the 'Natures Waste' translocation program, indicating a reasonable presence in the lower Murrumbidgee (NSW Fisheries Report, 1918). Recent publications have indicated that Macquarie perch spawn in upland streams, but the record of running ripe Macquarie perch being captured near Barmah by Tubb in 1937 (Cadwallader, 1977), along with oral history suggests that under some conditions the species can reproduce in lowland habitat. In the slopes zone historical sources record spawning aggregations in this type of habitat. Collectively the evidence points to Macquarie perch as being an adaptable species, at home in a diverse range of habitats from the mountain streams to the larger lowland rivers and lagoons.

In conclusion Macquarie perch were found from the Macquarie Catchment southwards and west into South Australia. The collective results for the Basin suggest that Macquarie perch, on average, were most abundant in the slopes zone (4.6), were common in the upland zone (3.2) and moderately common in the lowland (2.6) and montane (2.5) zones. The general trends from the rarity scores suggest that in the northern part of the species range, namely the Macquarie and Lachlan catchments, Macquarie perch were primarily an upland species, but that progressively south the favoured habitat shifted downstream into the slopes zone, though with a significant presence generally in the upland zone and eastern parts of the lowlands. The current altitude record for Macquarie perch is the Murrumbidgee River upstream of the present site of Tantagara Dam at around 1300 m ASL.

23.5.5 Translocations

The most famous translocation of Macquarie perch was from the upper King Parrot Creek into the Yarra catchment via the Plenty River in 1857 (Wilson, 1857). It was supplemented by further fish from the Murray, Goulburn and Broken catchments over nearly a hundred years. In the twentieth century alone over 21,000 Macquarie perch were released into the Yarra River (Cadwallader, 1981). Many other translocations took place to waters outside of the Murray-Darling Basin in Victoria including the Wimmera, Wannon, Avoca, Werribee, Barwon and Latrobe Catchments (Cadwallader, 1981). The result of the translocations was, in most cases, the creation of temporary populations which ultimately disappeared. A substantial population of Macquarie perch exists in the middle to lower Yarra River, a small population persists in the Wannon River and a recent capture by an angler suggests that they may still exist in the upper Barwon River.

In NSW Macquarie perch were translocated to Cataract Reservoir in the Nepean Catchment near Sydney from the Berembed Weir area in 1916 where they established a substantial population (NSW Fisheries Reports, 1914; 1923) which persists to the present day (Faulks *et al,* 2009). In the Shoalhaven catchment there appears to be two discrete populations of Macquarie perch, one in the lower reaches thought to be endemic, and another in the upper reaches, particularly in the Mongarlowe River, which was created by translocation from

the Queanbeyan area (Lintermans, 2008; *Sydney Morning Herald,* 26 May 1863; 15 October 1867; 22 February 1868). Attempts were made to introduce Macquarie perch to the Snowy River in NSW (Stead, 1913) but proved unsuccessful. Macquarie perch also appear to have been translocated to the upper reaches of the Belabula River in the Lachlan Catchment possibly as eggs sourced from the Bathurst area in the early 1880s (*Sydney Morning Herald,* 4 March 1886).

Arrangements were made to introduce Macquarie perch to Tasmania, but it is not clear if any were actually released as their introduction was opposed by the Tasmanian Salmon Commissioners (*Hobart Mercury,* 18 November 1909; 12 October 1911; 30 November 1911). Macquarie perch were also translocated to southern Queensland but failed to establish (Merrick & Schmida, 1984). Several hundred were reported to have reached England while others were possibly sent to Western Australia by William Saville-Kent (*Hobart Mercury,* 30 November 1911).

23.5.6 Size

Historical accounts indicate that any fish over two kg is a big Macquarie perch. In NSW fish up to 3 lb. (1.4 kg) were considered common with individuals up to 5 lb. (2.3 kg) being officially recorded (NSW Fisheries Report, 1910-13). Lake (1959) mentioned that an 8 lb. (3.6 kg) specimen had been seen, the same figure being subsequently quoted in many angling publications. Surveys of Macquarie perch in impoundments have reported the capture of fish over 3 kg (Cadwallader & Rogan, 1977). Harrison reported 8 lb. (3.6 kg) specimens to have been taken by commercial fishermen (Harrison, 1977) with fish of that size being captured near Barmah (Laddie Clifford, pers. com.). A newspaper account of an 18 lb. (8.2 kg) 'Macquarie perch' taken from the Merran Creek near Swan Hill (*Argus,* 18 July 1924) lacks detail to confirm the identity of the fish, which was more likely to have been a Silver perch. In 1939 a Macquarie perch weighing 7 lb. 15 oz. (3.6 kg) was caught in the railway reservoir at Coleraine, the species having been stocked into the reservoir by the Victorian Fisheries and Game Department (*Argus,* 25 February 1939), probably representing the largest accurately weighed specimen.

23.5.7 Migrations

The mass migrations of Macquarie perch out of impoundments into inflowing rivers for spawning has been reported (Cadwallader & Rogan, 1977). Schooling and migration appears to be a general trait of the species having been described in the oral history in natural waters such as the Axe Creek in the Campaspe catchment, and Larsen Creek in the Mitta Mitta catchment. Don Briggs recalled that the Yorta Yorta people considered the Macquarie perch to be migratory and Laddie Clifford informed the author of old stories of drum nets being filled with the species when migrating upstream between Barmah and Talmalmo. A feature of note is a strong, but not unpleasant, odour produced by the species detected by many people though not by others. Over the years a number of anglers have informed the author that they literally could smell large aggregations of Macquarie perch in waterways and one suggested his dog could find the fish by smell. The author has experienced this attribute on Lake Dartmouth when a large school swam under his boat in shallow water. One practice, reported by anglers in north east Victoria, was the use of fire to attract Macquarie perch to the location they fished, the species reputedly responding to light, being readily angled and at times taken by net at the stream bank. Several anglers suggested that the light illuminated the eyes of shrimp and this attracted the perch to the area.

23.5.8 Community Value

Lake (1967a) described the Macquarie perch as a 'quiet, furtive species' and considered it to be possibly the best freshwater table fish in Australia. Pratt concluded that it was superb eating, considering it to be in the gourmet class (Pratt, 1979). Many anglers interviewed indicated that they considered Macquarie perch to be the best table fish found in the Basin. Macquarie perch were part of the commercial inland fishery in NSW but few records document the catch of this species and most date from a time when they had undergone a substantial decline. Ogilby (1893) reported that Macquarie perch were regularly sent to the Melbourne market. In 1965-66 1807 kg of Macquarie perch were officially recorded as landed by commercial fishermen in NSW, dropping to 693 kg in 1974-75 (Harrison, 1977). Possible confusion of the species with Silver perch makes the actual quantities taken uncertain. The oral history indicates that most of the commercial take originated from the Murrumbidgee River upstream of Narrandera, the upper Edward River and the Murray River upstream of Echuca, though fish were taken from the Murray downstream into South Australia. In the early years of the fishery between Yarrawonga and Barmah, the take of Macquarie perch rivalled, and at times exceeded, that of Golden perch (Laddie Clifford, pers. com.). Commercial fishermen along the Central Murray River marketed the species locally as 'butterfish' and as they were considered to be the best table fish, they often commanded the highest price per kg (Laddie Clifford, Henry Davies & Bill Ellis, pers. com.).

Macquarie perch were highly regarded as an angling fish, considered to provide excellent sport and suitable for being taken on artificial flies (Hungerford, 1971). Many accounts recorded intense angling activity directed at Macquarie perch in Victoria including the capture of three quarters of a tonne of fish in a single day in a single pool below the Goulburn Weir in 1921 (*Argus,* 3 December 1921). Large captures of migrating Macquarie perch in the tributary rivers of Lake Eildon were legendary; at times they resulted in phenomenal harvests measured in tonnes per week (Cadwallader & Rogan, 1977) with anglers forming queues at favoured holes. In NSW Macquarie perch received far less publicity than in Victoria, but the historical evidence indicates that in the upland rivers they were also the focus of considerable angling activity, comprising a substantial part of the catch. Overall, in non-lowland habitats in the southern half of the Murray-Darling Basin Macquarie perch were once probably the most important angling species after cod. The enthusiasm that anglers had for Macquarie perch is exemplified by the atmosphere captured by journalist Donald Macdonald one morning in 1921:

> It was the opening morning of the fishing season at the great Nagambie weir on the Goulburn, and while it was yet dark some two hundred fishermen from all over the Valley, and some carloads of enthusiasts from the city were waiting for first go at the Macquarie perch / it was a fine scene in eagerness and activity, this midnight to morning rush down all the red roads of the famous valley for Macquarie perch (*Argus,* 3 December 1921).

23.5.9 Decline & Current Status

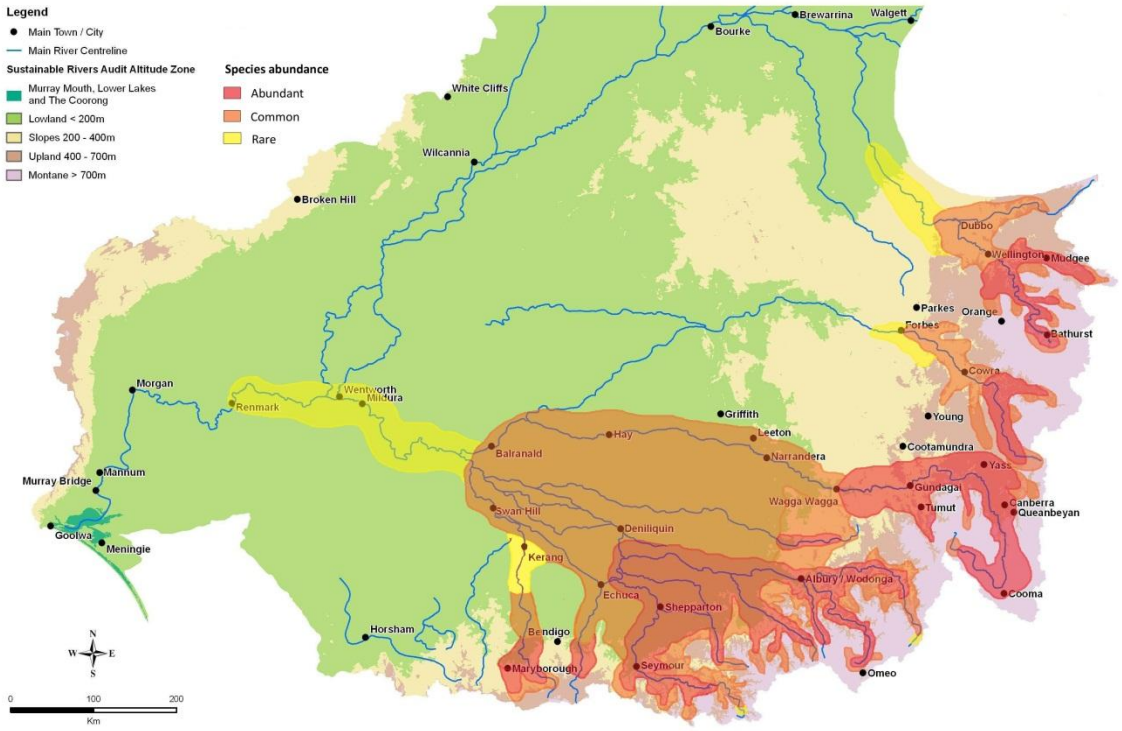
For such a once prolific species Macquarie perch has undergone a dramatic decline in its distribution and abundance. The historical evidence suggests that significant reductions in populations in some areas were evident by the early twentieth century with widespread population extinctions occurring from 1920-60. Macquarie perch had virtually disappeared in some of the higher altitude habitats, such the upper Macquarie, Mitta Mitta, Murray, King and Loddon Rivers by the end of the First World War. A further decrease was evident in the slopes zone by the late 1930s including the Macquarie, Murray, Kiewa, Ovens and Goulburn Rivers. By the end of the 1960s the endemic populations were largely restricted to the upper Lachlan and upper Murrumbidgee Catchments in NSW and the ACT, with limited numbers present elsewhere in the Murray-Darling Basin in that state, and relic populations in the slopes and upland zones of the Mitta Mitta,

Ovens, Broken and Goulburn Catchments in Victoria. Since that time most of the remaining populations, while persisting, have been further impacted by a range of factors including river regulation, bush fire events, the introduction of exotic fish species and possibly EHN Virus. The construction and filling of Lake Dartmouth on the Mitta Mitta River during the 1970s resulted in the proliferation of Macquarie perch in that water and the creation of a major fishery. In subsequent years the population in Lake Dartmouth has progressively diminished and while still present, the species is no longer abundant in that water. The most secure population is probably the one translocated to the Yarra River in the nineteenth century.

While still present in areas of the Hawkesbury, the endemic form of Macquarie perch appear to have recently become extinct in the Shoalhaven Catchment (Faulks *et al,* 2009), though the translocated population of the Murray-Darling form still exists in the upper reaches. If the endemic Shoalhaven form of Macquarie perch is ultimately determined to be a distinct species its loss may represent the first extinction of an Australian native fish, for it has not been detected in the wild since 1998, and none are known to be held in captivity with the last known specimen dying in 2008 (Faulks *et al,* 2009). Although almost disappearing from the Yarra River by the 1970s (Author's pers. obs.) the translocated population of Macquarie perch has undergone a remarkable recovery and today the Yarra River contains the best remaining riverine population of the species.

In NSW Macquarie perch are listed as endangered under the *Fisheries Management Act 1994;* in the ACT it is classified as endangered under the *Nature Conservation Act 1980*; in Victoria are listed as endangered under the *Flora and Fauna Guarantee Act 1988*. In South Australia Macquarie perch are considered extinct, and are protected by regulations under the *Fisheries Act 2007.* The only waters in which Macquarie perch can be taken by angling are in Victoria, namely the Yarra River and Lake Dartmouth and its tributaries. Until recently Macquarie perch have proved very difficult to breed in captivity but in 2010 the Narrandera Fisheries Centre successfully produced several hundred fingerlings which were liberated into a tributary of the Abercrombie River. In the same year in Victoria breakthroughs were also made at the DPI Snobs Creek Hatchery resulting in the production of several thousand fish. In Victoria the intention is to create recreational fisheries and improve the conservation status of the species with the primary stocking sites being Expedition Pass and William Hovel Reservoirs, the Ovens and Buffalo Rivers and the Goulburn River between Yea and Seymour.

Figure 23.5 **A Reconstruction of the Historical Distribution & Abundance of Macquarie Perch in the Southern Murray-Darling Basin**



23.6 Catfish, *Tandanus tandanus*

TANDAN.
BY FISHHOOK.

The color in this fish, as with many others, depends on the habitat of the fish, clear running streams containing the most silvery colored specimens. I have caught tandans, in a creek with muddy and clayey banks, of a dirty yellow, and in almost every stream they have different shades. The tandan is a fresh-water fish, and may be found in any of the waters which the cod perch (*Gustes Peelii*) inhabit. It is a very peculiarly-shaped fish, having a thick head rather flat on the top, with several tentacles on the upper and lower jaw, the body thick and nearly round, and tapering off with a tail like an eel; scales, if any, not visible to the naked eye, but there is a thick slime over the body. Though their looks are not prepossessing, these fish are very good eating—much superior indeed to many of more aristocratic shape. The usual weight of the tandan is about 3lb., and its food is small fresh water molluscs, which I always find in the stomachs of those I catch. The only bait they will take freely are worms or grubs, and they are fine and lively when hooked, often jumping out of the water. Like the cod, they are not found in schools, though often in pairs, and they haunt the edges of rapids or fords when the stream runs strong and forms eddies, and at the junction of creeks and gullies after rains—when worms or insects are brought down by the water. In the evening they find their way into shallow water only a few inches deep on fords, looking for shell-fish or other food. My plan for catching the tandan in these shallow places is to cast my line down the stream and work it gently up and across the running water. There is no nibbling, but a sudden snatch at the bait, and a rush on the fish's part for deeper water. Capital sport may be had in this manner of an evening, but the angler requires to keep very quiet, for on the slightest noise the fish glide off into the main stream

The Queenslander, 30 August 1879

TANDAN.
BY FISHHOOK.

The color in this fish, as with many others, depends on the habitat of the fish, clear running streams containing the most silvery coloured specimens. I have caught tandans, in a creek with muddy and clayey banks, of a dirty yellow, and in almost every stream they have different shades. The tandan is a fresh-water fish, and may be found in any of the waters which the cod perch (*Gustes Peelii*) inhabit. It is a very peculiarly-shaped fish, having a thick head rather flat on top, with several tentacles on the upper and lower jaw, the body thick and nearly round, and tapering off with a tail like an eel; scales, if any, not visible to the naked eye, but there is a thick slime over the body. Though their looks are not prepossessing, these fish are very good eating – much superior indeed to many of more aristocratic shape. The usual weight of the tandan is about 3lb., and its food is small fresh water molluscs, which I always fin in the stomachs of those I catch. The only bait they will take freely are worms or grubs, and they are fine and lively when hooked, often jumping out of the water. Like the cod, they are not found in schools, though often in pairs, and they haunt the edges of rapids or fords when the stream runs strong and forms eddies, and at the junction of creeks and gullies after rains – when worms or insects are brought down by the water. In the evening they find their way into the shallow water only a few inches deep on fords, looking for shellfish or other food. My plan for catching the tandan in these shallow places is to cast my line down the stream and work it gently up and across the running water. There is no nibbling, but a sudden snatch at the bait, and a rush on the fish's part for deeper water. Capital sport may be had in this manner of an evening, but the angler requires to keep very quiet, for on the slightest noise the fish glide off into the main stream

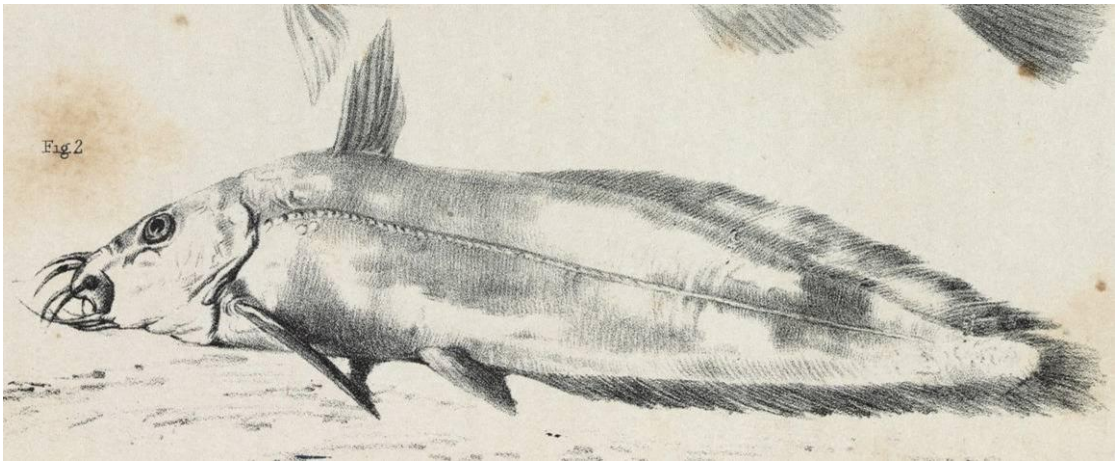
23.6.1 European Discovery

The first account of Catfish originated in 1818 when Oxley encountered the species in the Wellington area:

> A new species of fish was caught, having four smellers above and four under the mouth; the hind part of it resembled an eel, it had one dorsal fin, and four other fins, with a white belly; it measured twenty-one inches and a half, and weighed about two pounds three quarters (Oxley, 1820).

In December 1831 Mitchell (1838) captured Catfish in a lagoon near the Namoi River at Tangulda, sketching one in his journal, and recording observations of additional specimens he captured in the Barwon River a few weeks later.

Photograph 23.9 The First Catfish



Major Thomas Mitchell created this illustration in his journal of a Catfish captured from a lagoon near Tangulda in December 1831, naming the species *Plotosus tandanus* (Mitchell, 1839). Image reproduced with permission from the collection of the *State Library of Victoria.*

23.6.2 Aboriginal Names

Mitchell (1838) recorded the term 'Tandan' being used by aborigines near the Barwon River for the species, suggesting a Yuwaalaraay or Gamilaraay origin. In South Australia, in Lake Alexandrina, Catfish were known to the aboriginal people as 'Pomery' (Ngarrindjeri) (French, 1847; Zeitz, 1902), while near Blanchetown they were called 'Pulyee' by the Morunde people (*Argus,* 19 September 1848). In the Merbein area (Jari Jari) Catfish were called 'Kenaru' (Blandowski, 1858), while Baylis recorded 'Dundong' as being the name for Catfish near Wagga Wagga (Wiradjuri) (Wesson, 2001). In the Wemba Wemba language Catfish were known as 'Wanyakayi' or 'Pirra-wil' (Hercus, 1992) while in Yorta Yorta language it was known as 'Wannhak' (Bowe & Morey, 1999).

23.6.3 European Names

In 1838 Mitchell published a formal description of Catfish based on specimens he captured in 1831 naming the species *Plotosus tandanus*:

> Family, Siluridae, Cuv.; Genus Plotosus, Lacepede, or Eel-fish; subgenus, Tandanus mihi; species, Plotosus Tandanus mihi; or Tandan Eel-fish. Colour, silvery. The dorsal fin placed half way between the pectoral and ventral has six rays, of which the middle two are the longest. (Plate 6, fig 2, page 44). Obs.... Tandan, is an aboriginal name (Mitchell, 1838).

The species was later reassigned to the genus *Copidoglanis* but ultimately was placed in a new genus *Tandanus* and is now known as *Tandanus tandanus* (Paxton *et al.,* 1989). Lake (1959) listed Catfish, freshwater jewfish, tandan, dewfish, eelfish, eel-tailed catfish and kenaru as common names used for the species and a newspaper account reported that it was also known as 'Murray ling' (*Yea Chronicle*, 6 April 1893).

23.6.4 Distribution and Habitat

Apart from the Murray-Darling Basin, Catfish are found in catchments along the east coast from the Hawkesbury north to the Barron, near Cairns. Recent genetic research has indicated that some of the coastal populations may represent distinct sub-species or new species of *Tandanus.* It appears that the ancestral forms originated on the east coast before invading and colonising the Murray-Darling Basin through stream capture events (Musyl & Keenan, 1996; Jerry, 2005).

Within the Murray-Darling Basin, Lintermans (2007) recorded Catfish as being historically widespread throughout the Basin, though south of the Macquarie Catchment were rarely recorded upstream of the lowlands. He suggested that the species preferred slow-flowing streams and lake habitats, an association with more placid or stagnant habitats rather than flowing streams has also been suggested by other authors (e.g., Lake, 1967b; Llewellyn, 1983)

During this project 196 locations were identified as the source of probable or certain historical accounts of captures of Catfish and the collected evidence on the species abundance was used to develop rarity scores. The following table provides averages for the rarity scores created in each habitat zone in each catchment for Catfish using historical evidence in this investigation:

Table 23.7 Catfish Average Rarity Scores

	Zones			
Area	**Lowland**	**Slopes**	**Upland**	**Montane**
NSW & ACT	4.3	3.9	1.8	0.4
VIC	3.1	1.5	0.1	0.0
SA	4.3			
Basin	3.9	2.4	0.7	0.2

The average rarity scores suggest that in NSW Catfish were moderately abundant in the lowland (4.3) and slopes zones (3.9) with a modest presence in upland areas (1.8) and occasionally penetrating into the montane zone (0.4). The lowland and slopes scores have been influenced to some degree by the fact that Catfish were sometimes not reported to be abundant in the main channel of streams even though they had a strong

presence in the adjacent lagoons. The upland and montane scores have been significantly influenced by records indicating Catfish to have been common in the upland zones in the Macquarie and Lachlan catchments, with reliable accounts of captures at the very bottom of the montane zone. South of the Lachlan there are very few accounts of Catfish being taken upstream of the slopes zone. A museum record exists for a Catfish from the upper Murrumbidgee River near Cooma (*Australian Museum* database) but the actual collection details have not survived, so there is some doubt as to its reliability. There is no historical evidence of Catfish being present in the upland or montane zones of the Murrumbidgee prior to translocations, though additional historical research may locate evidence for their former presence. In NSW Catfish were strongly associated with the lowland and slopes zones and progressively extended into the upland zone in the northern catchments.

In Victoria the average rarity scores suggest that Catfish were common in the lowland zone (3.1) and had a modest presence in the slopes zone (1.5). As in NSW, their reported abundance in lagoons upstream to Mitta Mitta, Bright and Eildon in the slopes zone, suggest a stronger association with this zone than what the main channel rarity scores indicate. Catfish were very rare in the upland zone (0.1) being only recorded from the Loddon Catchment near Clunes, and in the Ovens Catchment near Harrietville. Catfish are unreported from the montane zone in Victoria. The average rarity score of 4.3 for South Australia indicates that the species was fairly abundant in the lower Murray River though there is evidence that their numbers varied along the length of the river.

Lake (1967b) suggested that low water temperatures restricted the distribution of Catfish, reporting that a temperature of 4 °C for several days proved fatal to juveniles as well as to some adults held in ponds. Tennison-Woods (1882) described the species as being 'very abundant in the lagoons and backwaters of the western rivers'. In contrast the coastal populations are associated with stream habitats commonly with gravel or sand substrates (Kennard & Pusey, 1997). The historical evidence confirms the species former abundance in lagoon and lake habitats, but also indicates that Catfish were, in places, common in flowing streams sometimes into the upland zone such as the Macquarie River.

In conclusion the collective results for the Basin suggest that Catfish, on average, were reasonably abundant in the lowland zone (3.9) with a significant presence in the slopes zone (2.4). They were rare in the upland zone south of the Lachlan but progressively increased in abundance in this zone northwards. Historically, Catfish showed a strong association with the lowland and slopes zones particularly in billabongs, lakes and backwaters. The current altitude record for Catfish is in the montane zone in the lower Duckmaloi River at about 800 m ASL.

23.6.5 Translocations

On at least one occasion Catfish from the Murray-Darling Basin were translocated to a coastal stream, namely the Hunter River (*Maitland Mercury & Hunter River General Advertiser*, 3 October 1885). They were probably also introduced to the Nepean Catchment amongst consignments of other native fish (NSW Fisheries Reports, 1914, 1923). Anglers have reported occasional captures of Catfish from the lower Yarra River, but it is unknown whether these fish have originated from recent releases or from translocation activities in the early twentieth century. Occasional captures have occurred elsewhere in southern Victoria. Catfish were translocated from the Murray River to the Wimmera River during the 1960s where they have established a self-supporting population (Clunie & Koehn, 2001a).

23.6.6 Size

Blandowski (1858) reported specimens up to 8 lb. (3.6 kg) being taken from the Merbein area while Langtry (Cadwallader, 1977) recorded similar sized fish being captured from the Murrumbidgee River. A maximum weight of 15 lb. (6.8 kg) and a length of up to 3 ft. (0.9 m) has been reported (Roughley, 1951; NSW Fisheries Report, 1887). Oral history suggests that Catfish as large as 20 lb. (9.1 kg) have been taken in the past by commercial fishermen and fish up to 14 lb. (6.4 kg) were reported to have been captured from the Merran Creek (*Argus,* 18 July 1924). The largest specimen for which there is a well-documented record was taken by Mitchell in 1836 from the Goobang Creek near Condobolin and weighed 12 lb. (5.5 kg) (Mitchell, 1838).

23.6.7 Nesting

Mitchell was the first to record the construction of a nest by Catfish for their eggs:

> I had previously observed, elsewhere, in the aquatic weeds growing in extensive reaches, clear circular openings, showing white parts of the bottom, over which one or two fishes continually swam round in circles. I now found in the dry bed, that such circles consisted of a raised edge of sand, and were filled with stones, some as large as a man's closed fist (Mitchell, 1848).

Many historical accounts recorded the nests of Catfish, often reporting them being constructed in amongst reeds in lagoons in the lowlands, or out of gravel in creeks or anabranches in the slopes and upland zones. Lake (1967a) reported that Catfish eggs sourced from nests in hatchery ponds were non-adhesive but recent work with captive fish has demonstrated that they are slightly adhesive (Trueman, 2006). Several historical accounts suggest that Catfish occasionally emerged from the water's edge to feed on moist river banks, or could cross over land a short distance between water bodies (*Argus*, 14 December 1917, 26 December 1917, 1 October 1920).

23.6.8 Community Use

Catfish, while secondary in importance to cod and Golden perch, were a significant part of the inland commercial fishery. Tenison-Woods (1882) stated that Catfish were 'brought abundantly to Melbourne by the Echuca railway' demonstrating their popularity as a table fish at an early date. The oral history indicates that at times they were specifically targeted by commercial fisherman, were regularly sent to the Sydney Market (Roughley, 1955). As recently as 1969 20 tonnes were marketed in South Australia (Hammer *et al.,* 2007). A few anglers loathed its appearance and this is probably contributed to the fact that very few historical photographs have been located of the species. In addition some people viewed the fish with suspicion, considering it to be poisonous. It is only the three spines in the fins containing a mild toxin which are capable of causing pain and swelling.

In the oral history most people held Catfish in high regard. Some rural families fondly recalled Catfish as providing a desperately needed source of income during the Great Depression. Catfish were popular with many people as both a table and angling fish. People interviewed reported that they preferred it as a table fish to Murray cod. Many anglers found Catfish to be a challenging adversary, as lauded by one Goulburn Valley angler in 1923:

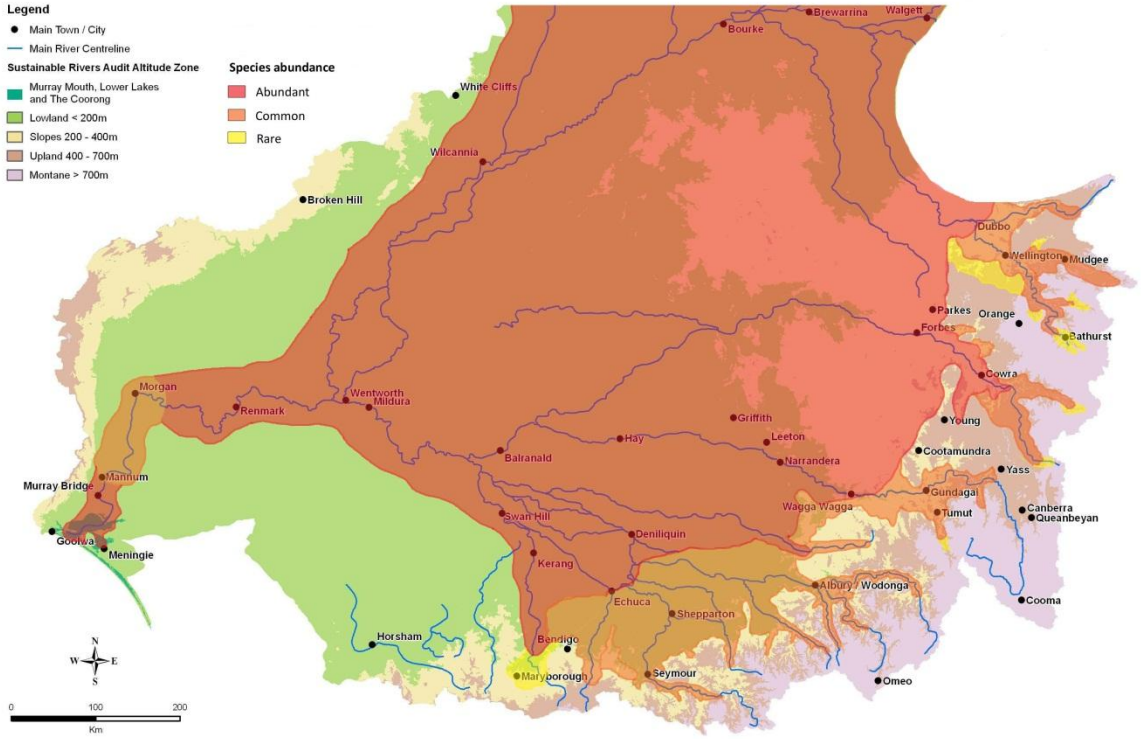
> When a catfish is hooked the angler's first thought is that he has been snagged, but the lively antics of the fish at the end of the line quickly dispels this idea. Only a trout of all our river fish makes livelier dashes. To get a fair sized catfish out of a river full of snags on a fine line and a light rod requires no little skill. There are many Goulburn anglers who ask for no better sport (*Argus,* 1 January 1923).

23.6.9 Decline & Current Status

The historical evidence suggests that in Victoria a dramatic decline occurred in Catfish populations during 1920-40 particularly in the slopes zone, where they had been abundant in lagoons. Major kills of Catfish were documented in the Goulburn Catchment between 1908 and 1929. Having once been abundant in the Central Murray River, by the late 1930s Catfish were considered rare captures upstream of Euston Weir (Roughley, 1951; Cadwallader, 1977) and disappeared after a drought in the upper Murray around 1918. Catfish are recorded as having become scarce in parts of the Murrumbidgee River by 1937 (*Sydney Morning Herald,* 7 August 1937). They maintained substantial populations in the lower Murray River, Riverina anabranches and lakes, the Darling River, and the lower Lachlan River until the 1970s (Clunie & Koehn, 2001a) but have subsequently declined in these areas. Today substantial Catfish populations are restricted to the northern part of the Basin, some impoundments, and the translocated population in the Wimmera River with scattered relic populations elsewhere.

In NSW, Catfish are listed as Endangered under the *Fisheries Management Act 1994* and can only be taken by anglers from listed impoundments and coastal rivers; in Victoria they are listed as threatened under the *Flora and Fauna Guarantee Act 1988* and can only be taken from the Wimmera River. In South Australia Catfish are considered endangered and cannot be taken by anglers, having been protected by regulations under the *Fisheries Act 2007.*There is a recent proposal in Victoria to produce Catfish in hatcheries and stock juveniles into some waters for recreational angling and to assist in the recovery of wild populations.

Figure 23.6 **A Reconstruction of the Historical Distribution & Abundance of Freshwater Catfish in the Southern Murray-Darling Basin**



23.7 River Blackfish, *Gadopsis marmoratus*, & Two-spined Blackfish, *Gadopsis bispinosus*

BLACKFISH NOTES.

Without challenging scientific conclusions on the point, my impression agrees with that of "Loddon," who concludes that the small blackfish got in Victorian streams north of the Divide is distinct from the larger southern blackfish. The size alone would lead one to suspect that conclusion. With fish of the same species, size is mainly a matter of food supply, and when one notes the size and numbers of both native and introduced fish which thrive in the northern streams that are tributaries of the Murray it is difficult to believe that scarcity of food has dwarfed the northern blackfish, which at its best only weighs a few ounces, and is a Tom Thumb as compared with some of the giants of the southern rivers. Mr. Tom Fisher, after months of investigation, believes that there is more than one species in Gippsland, though others think that marked differences in appearance only indicate particular stages of growth in the same variety. My recollection of the northern blackfish is that it is always slim, and never at the same weight anything like so strong or deep in the body as the southern variety.

Argus, 29 May 1925

BLACKFISH NOTES

Without challenging scientific conclusions on the point, my impression agrees with that of "Loddon." Who concludes that the small blackfish got in Victorian streams north of the Divide is distinct from the larger southern blackfish. The size alone would lead one to suspect that conclusion. With fish of the same species, size is mainly a matter of food supply, and when one notes the size and numbers of both native and introduced fish which thrive in the northern streams that are tributaries of the Murray it is difficult to believe that scarcity of food has dwarfed the northern blackfish, which at its best only weighs a few ounces, and is a Tom Thumb as compared with some of the giants of the southern rivers. Mr. Tom Fisher, after months of investigation, believes that there is more than one species in Gippsland, though others think that marked differences in appearance only indicate particular stages of growth in the same variety. My recollection of the northern blackfish is that it is always slim, and never at the same weight anything like so strong or deep in the body as the southern variety.

23.7.1 European Discovery

The earliest European account of Blackfish is the description of the species by Richardson (1848) based on the skin of a dried specimen collected during the expedition of the *Erebus* and *Terror* collected from 'southern parts of Australia'. In the Murray-Darling Basin the earliest account is that of Blandowski (1858) who reported their presence in billabongs near Merbein in 1857.

Photograph 23.10 The First Blackfish

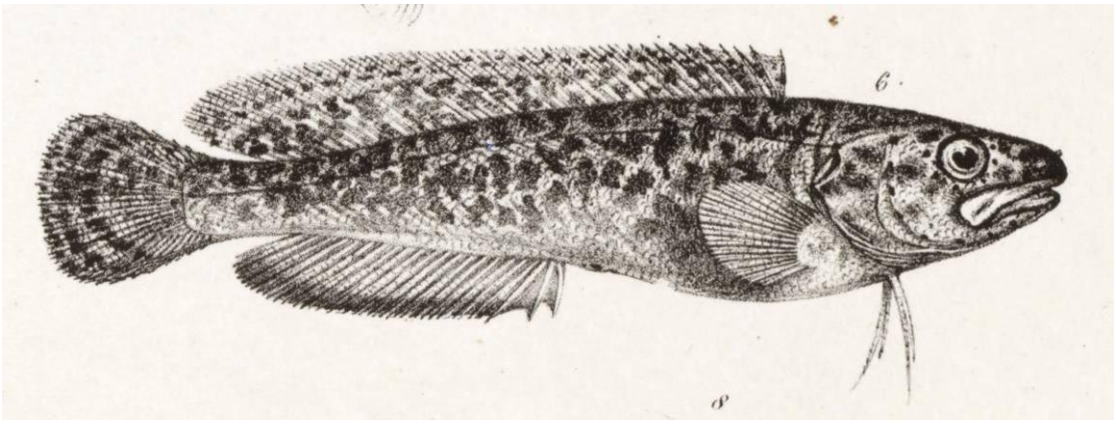


Illustration of a Blackfish, *Gadopsis marmoratus,* in the first taxonomic description of the species. From Plate 59, *Ichthyology of the voyage of H. M. S. Erebus and Terror, under the command of Captain Sir James Ross.* Image reproduced from the collection of the *National Library of Australia*.

23.7.2 Aboriginal Names

Blandowski (1858) recorded 'Paltk' as the name for Blackfish of the Yarree Yarree near Merbein. In the McKenzie's Falls area in the Grampians 'Mekunang' was used by local aboriginal people (Djadjawurrung) for Blackfish (Wesson, 2001), while the Ngunawal people of the Canberra area referred to Blackfish as 'wuggar' (Mathews, 1904). In 1847 Victorian surveyor W. S. Urquhart noted in his field book that 'werrup' was used by the Bunnerong people of Gippsland as the word for the Blackfish and he elected to name the large swampland east of Cranbourne as 'kowe-werrup' (= 'water-blackfish') indicating the presence of plentiful Blackfish (Wesson, 2001). Today the town of Koo-Wee-Rup honours the former presence of Blackfish in the local swamps most of which have been drained and turned into farmland.

23.7.3 European Names

Richardson (1848) named the species *Gadopsis marmoratus* though it is unknown whether the specimen originated from the Australian mainland or Tasmania (Ogilby, 1913). Early accounts highlighted differences in size between the various populations, as well as variations in form and colour. A number of naturalists concluded that there was more than one Blackfish species. Blandowski (1858) named the species *Brosmius bleasdalii.* McCoy (1879) proposed the existence of two additional species *Gadopsis gracilis* and *G. gibbosus* from the Yarra and Bunyip catchments respectively, though later workers did not recognise any of them (Ogilby, 1913). In the late twentieth it was demonstrated that there were two distinct species in the Murray-Darling Basin, the second being the Two-spined blackfish *Gadopsis bispinosus* which appears to be largely restricted to upland habitats as far north as the ACT (Sanger, 1984). Recent research has suggested that

Gadopsis marmoratus should be separated into two separate species, one present in southern Victoria and Tasmania and the other in the Murray-Darling Basin ,with populations in the Murray-Darling Basin showing a fair degree of genetic diversity (Miller *et al.,* 2004).

Common names used in the past for Blackfish included fresh-water blackfish, tailor or tailer, marbled river cod, slippery, gudgeon, Nikkie long cod and Nikkie (Ogilby, 1913). Lintermans (2007) listed slimy, muddy and greasy as additional names for the species. Modern publications use the term 'Freshwater blackfish' to distinguish them from a common estuarine and marine species known as 'blackfish'. During the author's youth a commonly used named for Blackfish in north east Victoria was 'grayling', and also used by one newspaper correspondent (*Argus,* 7 November 1911). This causes considerable confusion with a coastal species sharing that name, the Australian grayling *Prototroctes mareana*. In the upper Lachlan catchment a number of anglers referred to Blackfish as 'blueguts'.

23.7.4 Distribution and Habitat

Blackfish are naturally found outside of the Murray-Darling Basin in catchments along the southern coast of the mainland, from the Onkaparinga and Torrens catchments eastwards to the Snowy River, and also in northern Tasmania (Ogilby, 1913). It appears that a population of Blackfish may have existed in the headwaters of at least one east coast stream in NSW with 'slipperies' being reported in the Jenolan River upstream of the Jenolan Caves (Maher, OH 5).

Within the Murray-Darling Basin Lintermans (2007) recorded River blackfish as being historically widespread throughout northern Victoria, restricted to the middle and upper reaches of most NSW catchments, but absent from the Darling River and some of its northern tributaries. He identified Two-spined blackfish as having been found from the Murrumbidgee Catchment south to the Goulburn Catchment, and as being restricted to upland and montane habitats (Lintermans, 2007).

During this project 210 locations were identified as the source of probable or certain historical accounts of captures of Blackfish and the collected evidence on the species abundance was used to develop rarity scores. It was impossible to distinguish between historical accounts of River blackfish and Two-spined blackfish, most records simply describing the fish as 'Blackfish' or one of the many common names employed for these fish. It is assumed that many accounts of Blackfish within the known range of Two-spined blackfish probably relate to that species though in some areas the two species can be found together. The following table provides averages for the rarity scores created in each habitat zone in each catchment for Blackfish using historical evidence in this investigation:

Table 23.8 Blackfish Average Rarity Scores

	Zones			
Area	**Lowland**	**Slopes**	**Upland**	**Montane**
NSW & ACT	2.2	4.7	4.5	4.1
VIC	4.0	4.6	4.7	2.0
SA	1.5			
Basin	2.6	4.6	4.6	3.4

The average rarity scores suggest that in NSW Blackfish had a modest presence in lowland habitats (2.2) but were abundant in the slopes (4.7) and upland (4.5) zones and moderately abundant in the montane zone (4.1). The records for Blackfish in the montane zone in NSW are somewhat limited, but those that exist in the Macquarie, Lachlan and Upper Murray Catchments suggest that they were locally moderately abundant in the lower reaches of this zone, particularly in the larger creeks. The lowland score has been influenced by the fact that Blackfish were recorded as being rare, or at best moderately common, in the main channel of some lowland rivers, but were very common in adjacent lagoon habitats. The species had a stronger association with the lowlands than what the score suggests. Many historical accounts record an association of Blackfish with lagoons in the lowlands, Tenison-Woods (1882) describing the species as a 'mud fish' found in the lowlands. Ogilby (1913) provided a significant record in reporting them to have been common in lagoons at Walgett, well west of the records provided by Lintermans (2007). The historical evidence indicates that in NSW Blackfish were abundant in all non-lowland habitats and, while common in some lowland rivers, were more prevalent in lagoons in this habitat zone.

In Victoria the average rarity scores suggest that Blackfish were very common to abundant in lowland (4.0), slopes (4.6) and upland zones (4.7) and had a modest presence in the montane zone (2.0). The figure for the montane zone has been influenced to some degree by limited records in some areas. In some catchments such as the Mitta Mitta there is good evidence of them having been common in the lower reaches of the montane zone. Unlike the other larger native species, Blackfish were sometimes present upstream of significant waterfall barriers. As in NSW, historical accounts record a strong presence in lagoons in the lowlands and, in addition, they were common in lowland creeks. It can be concluded that Blackfish were very common in most habitats in Victoria with the exception of the upper reaches of the montane zone. The average rarity score of 1.5 for South Australia reflects the limited records of Blackfish in the Basin in that state. Some accounts suggest that Blackfish may have been common in lagoons along the lower Murray (Blandowski, 1858; *Argus*, 2 February 1922, 7 July 1925) and in the lower lakes (Zeitz, 1902).

In conclusion Blackfish appear to have been present in a diverse range of habitats from the montane zone down to Lake Alexandrina. Ogilby (1913) reported their past abundance in slopes, upland and montane habitats into alpine conditions, and in some of these areas they were prolific. A trend appears that in the western lowlands Blackfish were generally far more common in lagoons and lakes than rivers. The collective results for the Basin suggest that Blackfish, on average, were abundant in the slopes (4.6) and upland zones (4.6), were common in the montane zone (3.4) and reasonably common in the lowland zone (2.6). Of the larger fish species, in the Basin Blackfish generally were reported to be found at higher altitudes than the others, and in some small creeks, were the largest species present. The current altitude record for Blackfish is in the montane zone in the upper Cotter River at about 1000 m ASL (Lintermans, 1998) though it is likely that they were found at even higher locations in some catchments, particularly the upper Murrumbidgee.

23.7.5 Translocations

On several occasions anglers have advocated introducing coastal Blackfish into the Murray-Darling Basin and it appears that this may have taken place in the upper Loddon River near Glenlyon (*Argus,* 26 September 1930). Blackfish were on one occasion translocated from the Murray-Darling Basin near Heathcote to Hanging Rock Reservoir, in the coastal Maribyrnong catchment (*Argus,* 1 February 1924). It was reported that Blackfish had been translocated to the Snowy River with specimens sourced from the Craigie River in Victoria in 1883 (Ogilby, 1913). The Craigie River is part of the Snowy Catchment, so the species was clearly native to the catchment.

23.7.6 Size

In coastal Victoria and Tasmania Blackfish have been reported to grow to a substantial size. Ogilby (1913) quoted a letter received from Tasmania reporting fish as heavy as 12 lb. (5.5 kg) being taken and 7 lb. (3.2 kg) plentiful stating 'I may mention three rods taking 24 dozen in a night, and another three rods taking 63, weighing from 1½ to 6 lb. apiece'. In the Murray-Darling Basin huge specimens have never been reported. Ogilby (1913) stated that anything over 12 inches (30 cm) was considered a large fish with specimens up to 18 inches (45 cm) being captured in the Macquarie catchment. Tenison-Woods (1882) reported a specimen measuring 16½ inches (41 cm) in length.

Blackfish in the Murray-Darling Basin have, on occasion, been reported to grow to a reasonable weight. Fish stocked into a farm dam at St. Arnaud reached 1½ lb. (0.7 kg) (*Argus,* 27 February 1932) while fish up to 1 lb. 11 oz. (0.9 kg) were taken from a creek near Stewarts Bridge, on the lower Goulburn River (*Argus,* 17 September 1929). Even allowing for some angler exaggeration it appears that under some circumstances long lived individuals can reach over a pound (0.5 kg) in weight. Historical accounts have suggested that Blackfish avoid direct sunlight and are most active at night or when the water is discoloured during floods. Albino Blackfish have been captured with one recorded from the upper Hughes Creek near Ruffy in 1938 (*Argus,* 18 June 1938), possibly another in Tasmania (*Hobart Mercury,* 5 October 1881).

23.7.7 Community Value

Blackfish are the smallest of the native fish regularly taken by anglers in the southern half of the Murray-Darling Basin. The southern form of River blackfish, which grew to in excess of 5 kg, was a popular target of anglers in southern Victoria and northern Tasmania and was considered to have superb table qualities. C. J. Dennis wrote a poem indicating his admiration for the species namely 'The Blackfish' published in the Melbourne *Herald* in 1937. Donald Macdonald in his book *Gum Boughs and Wattle Bloom* (MacDonald, 1887) devoted a whole chapter to the pleasure he gained from catching Blackfish.

In the Murray-Darling Basin, Blackfish were often overshadowed as an angling target by the larger species, though many oral accounts indicate that in the early days 'greasies' were popular as bait for cod in some areas. Many anglers welcomed them when nothing else was biting due to their excellent table qualities. In the smaller creeks Blackfish were often the main target of anglers and they were popular with children. Comments penned by Strathbogie angler Collin Halsall reflect the admiration that many anglers held for Blackfish in the Murray-Darling Basin:

> I feel I would be remiss if I did not pay a special tribute to the humble Blackfish which has been caught up to 14 inches long and three quarters of a pound in weight. Black fish in local streams average about 5 or 6 inches. They are called "Greasies" by many anglers but are recognised as an excellent sweet pan fish even though small. Many a budding angler started his lifetime sport with a bamboo rod fishing for "Blackies" (Halsall, 1979).

23.7.8 Decline & Current Status

Blackfish are now rare in some catchments such as the Macquarie, Lachlan, Riverina and Central Murray, and in South Australia. Today Blackfish are most commonly associated with higher altitude habitats, but the historical evidence indicates that they were formerly very common in lagoon habitats in the lowlands from the Murrumbidgee Catchment south. They have disappeared from many areas, though persist in others, notably in some catchments in north east Victoria where they are common. Historical accounts indicate that during the

first half of the twentieth century they virtually disappeared from many upland areas. In recent decades they have made somewhat of a recovery in this habitat in Victoria. Blackfish have almost totally vanished from lowland habitats. From the limited available historical evidence it appears that lowland populations underwent a general decline from 1900-40 and can be considered to be critically endangered in this zone. Populations persist in South Australia in four tributaries of the Mount Lofty Ranges namely the Marne, Bremer and Angas Rivers and the Tookayerta Creek. A program to produce juvenile Blackfish in captivity in South Australia resulted in success in 2009 and a captive breeding program is also underway at the Narrandera Fisheries Centre in NSW (Westergaard & Ye, 2010).

In NSW, River blackfish and Two-spined blackfish are totally protected under the *Fisheries Management Act 1994.* Two-spined blackfish in the ACT is classified as vulnerable under the *Nature Conservation Act 1980* and is protected from angler take. In South Australia River blackfish are considered endangered and cannot be taken by anglers, where they are protected by regulations under the *Fisheries Act 2007.* In Victoria Two-spined blackfish are listed under the *Flora and Fauna Guarantee Act 1988,* but the species can be taken by anglers as can River blackfish.

Figure 23.7 **A Reconstruction of the Historical Distribution & Abundance of Blackfish Species in the Southern Murray-Darling Basin**

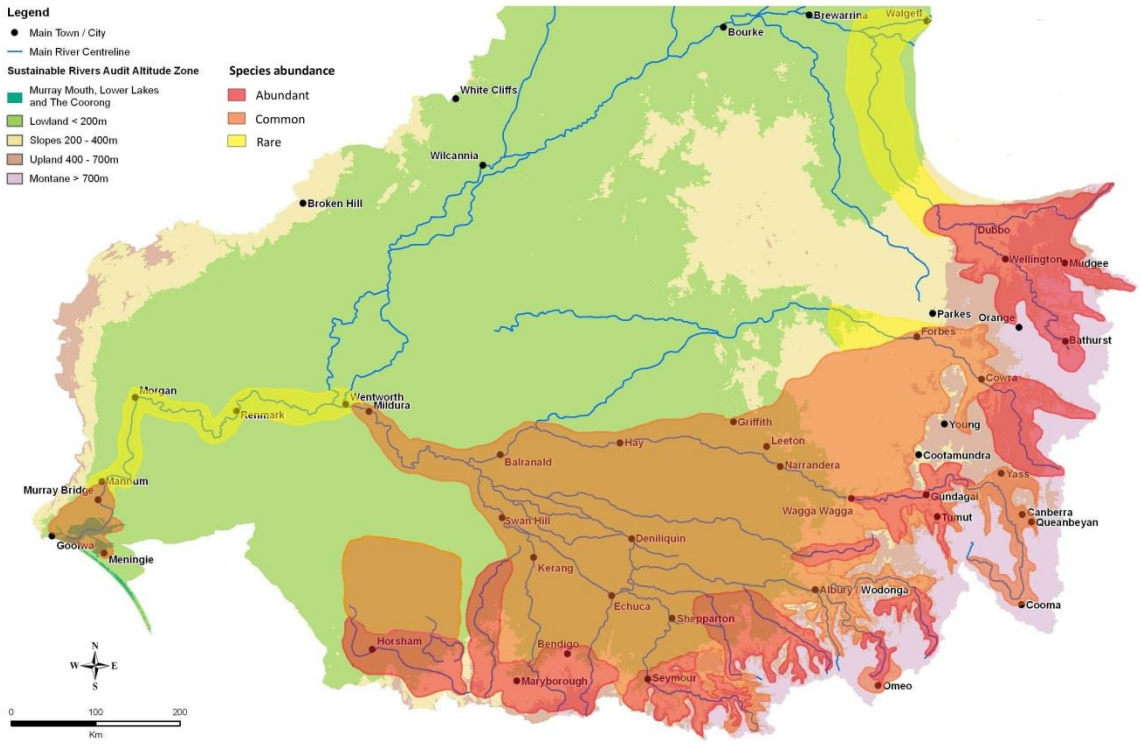


Table 23.9 ASFB Conservation Status of Murray-Darling Basin Fishes

The following table presents the most recent (2011) assessment of the conservation status of Murray-Darling Basin Fishes by the Threatened Fishes Committee of the Australian Society for Fish Biology courtesy of the Convenor, Mark Lintermans (**Mark.Lintermans@canberra.edu.au**). It utilises IUCN conservation categories and criteria.

Category	Scientific Name	Common Name
CRITICALLY ENDANGERED		
	Craterocephalus fluviatilis	Murray hardyhead
	Galaxias fuscus	Barred galaxias
	Maccullochella macquariensis	Trout cod
ENDANGERED		
	Macquaria australasica	Macquarie perch
VULNERABLE		
	Craterocephalus amniculus	Darling River hardyhead
	Edelia obscura	Yarra pygmy perch
	Galaxias rostratus	Flat-headed galaxias
	Maccullochella peelii	Murray cod
LOWER RISK – LEAST CONCERN		
	Mogurnda adspersa	Southern purple-spotted gudgeon

24 Australian Aboriginal Fisheries

ABORIGINAL SCIENCE.

Fish-traps and Fish-balks.

(BY MARY GILMORE.)

That the aborigines made fish-traps and fish-balks (as we used to call them when we came across them) is a fact. That they used natural barriers as Mr. David G. Stead writes is also a fact. Sixty years ago there were many of the smaller balks in existence, and white people knew them and made use of them for other purposes than those intended by the aborigines. The larger fish-traps were made for the great gatherings, and were invariably based on a running reef or a natural outcrop of rock. There were a number of these places of gathering known to my people, and I often heard them spoken of. One of these was on the Clarence, one at Brewarrina, one on the Upper Murray, and one down near Hay or Narrandera—it was near the swamps between these two places, the swamps being sanctuaries. Where there were billabongs stone traps were not in use, as floods filled the bends and lagoons, and the fish had room to feed and grow as freshets replenished the supply. But on the long, slow waters of inland rivers stone traps were made where a suitable place was available, and these were keyed by temporary stones so that the size of the fish to go through them could be regulated. The keys on one smaller stone trap on the Upper Murrumbidgee were shown my father, and the manner of setting them explained to him. They were so placed and fitted that the current would not shift them, and they could not be embedded in silt after floods. They were keyed, spaced, and angled in a certain way to meet force, and yet let the water through.

Sydney Morning Herald, 8 November 1933

The small balks were made on tributary streams, and it was a public tribal duty to see that they were neither clogged nor broken down. As white settlement increased and stock took the place of human beings, my father pointed out, again and again, that these barriers were being destroyed, that the conservation of fish in the streams depended on them, that (as the aborigines taught), without them, the great fish would devour the smaller fish as the waters went down, and that the end would be loss—a loss that the years since have proved to be fact, for we have had to replenish rivers that were once alive with fish.

The barriers were destroyed in two ways. One was by taking the timber or stones that formed them, the stones making hearths, and the timber firewood for camps; and the other was by leaving the balks where they were and making the place the site of a dam. Again and again I have heard it remarked with astonishment that "the instinct" (and how I have learned to hate that so much misapplied word!)—that "the instinct" of the black enabled him to do what it would take a surveyor with a theodolite to do as well. For wherever there was a fish-balk that was the one best possible place for the bank of a dam. On the slopes of a watershed, "no one but a self-opiniated fool" ever thought of putting a dam anywhere else. (There were such now and then, and the first occasion proved their

On creeks, that were not constant, and on little gullies I have seen scores of timber balks or traps. As with the bough wurlies they made which kept out ordinary rain, and which stood without blowing away till some forest fire burned them, the natives followed a tribally formulated scientific law, evolved from centuries of use, in the making of these. Whether of stone or wood, they were always placed with an eye to the slope of the land above them, the run of the water as it came to its height, and the one position best fitted to withstand pressure and yet let unwanted water go by. On seasonal creeks, where there

could not be any deep storage of water, I have seen six and eight inch saplings used. On permanent billabongs like the Edwards at Deniliquin, and Pregan-Pregan, and the Wollundry at Wagga Wagga, big logs made the barrier.

The last small fish-balk I saw was in about 1880, when driving with my father somewhere near what is now Ardlethan. As we camped to boil the billy we made a fire of long-dead wood lying across the bed of a dry gully. A fire made in a gully was safer than one made above, as it did not catch the wind, and the grass was like tinder that year. As I stood in the bed of the creek looking down at the dry saplings with their interlacing of desiccated twigs, I suddenly saw some bones, snow-white and unlike any that I had ever seen before. I picked them up to examine them.

"What a strange backbone for a snake," I said; "I never saw one like that before!"

"That is not a snake," my father replied, looking up from the fire. "Those are fish bones."

"But how can they be fish bones when there is no water here?" I protested.

"This is an old fish-trap that we are burning," answered my father. Then he went on to explain about the smaller fish-balks. And as I poked about among the debris I found not only more bones, I found bleached scales, and some of them still a little blue.

I might say that old bushmen, when travelling, would look for such places in the hope of water remaining and a fish left in it. One of my uncles got the surprise of his life, once, going to fill his billy at a bend where there was a balk, for he found a fish big enough to make him two meals.

Because people in the past (as well as in the present) did not relate cause and effect when a dam was made or a tank sunk where there had been a fish barrier, and later on fish were found in these, it used to be argued that they bred by a spontaneous effort of nature, or "just as eels come from horse-hair." Actually they came from survivals of ova, or small fish, left there by the blacks, when every gully had its tiny balk of brush and wood, and every running stream its barrier of stone or logs.

But it was only the great long rivers that needed the traps that to-day puzzle the scientists. And here the aboriginal made use of what nature gave him: "By instinct," people said.

Aboriginal Science

Fish-traps and Fish-balks

(By Mary Gilmore)

That the aborigines made fish-traps and fish-balks (as we used to call them when we came across them) is a fact. That they used natural barriers as Mr David G Stead writes is also a fact. Sixty years ago there were many of the smaller balks in existence, and white people knew them and made use of them for other purposes than those intended by the aborigines. The larger fish-traps were made for the great gatherings, and were invariably based on a running reef or natural outcrop of rock. There were a number of these places of gathering known to my people, and I often heard them spoken of. One of these was on the Clarence, one at Brewarrina, one on the Upper Murray, and one down near Hay or Narrandera – it was near the swamps between these two places, the swamps being sanctuaries. Where there were billabongs stone traps were not in use, as floods filled the bends and lagoons, and the fish had room to feed and grow as freshes replenished the supply. But on the long, slow waters of inland rivers stone traps were made where a suitable place was available, and these were keyed by temporary stones so that the size of the fish to go through them could be regulated. The keys on one smaller stone trap on the Upper Murrumbidgee were shown my father and the manner of them explained to him. They were so placed and fitted that the current would not shift them and they could not be embedded in silt after floods. They were keyed, spaced and angled in a certain way to meet force, and yet let the water through.

The small balks were made on tributary streams, and it was a public tribal duty to see that they were neither clogged nor broken down. As white settlement increased and stock took the place of human beings, my father pointed out, again and again, that these barriers were being destroyed, that the conservation of fish in the streams depending on them, that (as the aborigines taught) without them, the great fish would devour the smaller fish as the waters went down and that the end would be loss – a loss that the years since have proved to be fact, for we have had to replenish rivers that were once alive with fish.

The barriers were destroyed in two ways. One was by taking the timber or stones that formed them, the stones making hearths, and the timber firewood for camps; and the other was by leaving the balks where they were and making the place the site of a dam. Again and again I have heard it remarked with astonishment that "the instinct" (and how I have learned to hate that so much misapplied word!) – that "the instinct" of the black enabled him to do what it would take a surveyor with a theodolite to do as well. For wherever there was a fish-balk that was the one best possible place for the bank of a dam. On the slopes of a watershed, "no one but a self-opinionated fool" ever thought of putting a dam anywhere else. (There were such now and then, and the first occasion proved their….

On creeks, that were not constant, and on little gullies I have seen scores of timber balks or traps. As with the bough wurlies they made which kept out ordinary rain, and which stood without blowing away till some forest fire burned them, the natives following a tribally formulated scientific law, evolved from centuries of use, in the making of these. Whether stone or wood, they were always placed with an eye to the slope of the land above them to run of the water as it came to its height and the one position best fitted to withstand pressure and yet let unwanted water go by. On seasonal creeks, where there could not be any deep storage of water, I have seen six and eight inch saplings used. On permanent billabongs like the Edwards at Deniliquin, and Pregan-Pregan, and the Wollundry at Wagga Wagga, big logs made the barrier.

The last small fish-balk I saw was in about 1880, when driving with my father somewhere near what is now Ardlethan. As we camped to boil the billy we made a fire of long-dead wood lying across the bed of a dry gully. A fire made in a gully was safer than one made above, as it did not catch the wind and the grass was like tinder that year. As I stood in the bed of the creek looking down at the dry saplings with their interlacing of desiccated twigs, I suddenly saw some bones, snow-white and unlike any I had ever seen before. I picked them up to examine them.

"What a strange backbone for a snake" I said; "I never saw one like that before!"

"That is not a snake" my father replied looking up from the fire. "Those are fish bones".

"But how can they be fish bones when there is no water here?" I protested.

"This is an old fish-trap that we are burning," answered my father.

Then he went on to explain about the smaller fish-balks. And as I poked about among the debris I found not only more bones, I found bleached scales, and some of them still a little blue.

I might say that old bushmen, when travelling, would look for such placed in the hope of water remaining and a fish left in it. One of my uncles got the surprise of his life, once, going to fill his billy at a bend where there was a balk, for he found a fish big enough to make him two meals.

Because people in the past (as well as in the present) did not relate cause and effect when a dam was made or a tank sunk where there had been a fish barrier, and later on fish were found in these, it used to be argued that they bred by spontaneous effort of nature, or "just as eels come from horse-hair." Actually they came from survivals of ova, or small fish left there by the blacks, when every gully had its tiny balk of brush and wood, and every running stream its barrier of stone or logs.

But it was only the great long rivers that needed the traps that to-day puzzle the scientists. And here the aboriginal made use of what nature gave him: "By instinct," people said.

Sydney Morning Herald, 8 November 1933

Many early historical accounts written by European explorers and settlers described the fishing practices of aboriginal people in the southern Murray-Darling Basin. Ethnologists concluded that they were a nomadic hunter-gather people living a subsistence existence, moving from place to place as resources became available or were depleted. A number of historical accounts, however, suggest a different assessment and indicate that some aboriginal groups actively managed the native fishery and the aquatic environment.

24.1 Wooden Weir Fish Traps

The permanent structures used by aborigines for fish management that are most commonly described in historical accounts, were wooden weirs consisting of vertical stakes driven into the stream bed intermeshed with smaller horizontal sticks or branches. These were typically built across creeks or anabranches leading into larger streams, usually below a small natural barrier in the watercourse. The rationale behind their operation was that when the streams rose during flood time fish would use the high water to pass over the weirs into the adjoining waters. When the flood waters ebbed, the fish trying to return to the main channels became trapped behind the weirs.

The first account of native stick weirs in the basin came from Charles Sturt who observed them in anabranches of the Macquarie River in the Macquarie Marshes during December 1828: 'We passed a singular scaffolding erected by the natives, on the side of the channel, to take fish; and also found a weir at the termination of it for the like purpose so that it was evident the natives occasionally ventured into the marshes' (Sturt, 1833). Major Thomas Mitchell encountered native timber weirs during several of his expeditions, the first being in January 1832 in a creek near the Barwon River where 'Drift timber and other fluviatile relics lay high on the banks, and several weirs for catching fish, worked very neatly, stood on ground quite dry and hard' (Mitchell, 1838).

A wooden weir was reported by a naturalist in 1849 in an anabranch of the Murray River between Robinvale and Mildura (*Argus,* 30 March 1850). Peter Beveridge (1889) described the existence of many of these structures adjacent to the Murray River at Tyntynder:

> They make stake weirs across the drains, the stakes being firmly driven into the soil within an inch of each other, so that anything having greater bulk than that space must perforce remain on the landward side of the weir. Without any stretch of the imagination, the reader can easily fancy the shoals of fish which congregate behind these weirs when the river is falling, and what a very simple matter the taking of them must be. When fish are required a native takes his canoe into the midst of one of these shoals, and harpoons as many as he wishes, or until he becomes tired of the fun' (Beveridge, 1889).

Mary Gilmore (1933, 1934, & 1935) discussed in detail two types of wooden structures constructed by aboriginal people in the Wagga Wagga area. The first were barriers placed across the entrances of lagoons using large trees that were felled and interlaced with smaller branches. She identified Pregan Pregan Lagoon at North Wagga Wagga as one location where these structures were used, as well as others at Edward Lagoon near Deniliquin, Narrandera and in the Bland Creek. She also witnessed the construction of one in Wollundry Lagoon near Wagga Wagga c1874. Gilmore received correspondence in 1935 from Miss E. A. Harwood reporting that similar large balks existed across creeks and in billabongs near the Murray River at Renmark as late as the 1870's, and two at Markaranko Station above Morgan (Gilmore, 1895).

The second type of structure reported by Gilmore were wooden balks or weirs, sometimes incorporating stone, constructed across gullies containing ephemeral creeks to form ponds. Their purpose was to provide permanent supplies of both water and fish. On some creeks they were numerous, with Gilmore (1934) stating 'On creeks that were not constant, and in little gullies that only ran sometimes, I have seen scores of timber balks or traps.' The ponds created by these small dams were progressively destroyed by settlers who either constructed larger dams over them, or used the balks as firewood. The last of them observed by Gilmore was near Ardlethan in 1880 (Gilmore, 1933).

Weir traps were not only used in lowland streams, but also at higher altitudes such as in the Cudgewa Creek near Kalangee and Lucyvale, as well as in other streams in the Upper Murray Catchment. Jean Carmody (1981) described their construction in a similar fashion to that reported by Mary Gilmore:

> Careful planning preceded the construction of a fish trap. When a tree was found on a bank with the correct conformation (set of limb and length of trunk), the roots were partially undermined on the side facing the stream, and the next flood completed the task. With only their bare hands to do the work, members of the tribe guided the fallen tree downstream until it was time to manoeuvre it across between the banks. A lacing of small branches and rolls of grass was used to criss-cross the space below the tree trunk, and the careful interlacing of suitable poles held this net firmly in place' (Carmody, 1981).

Like Gilmore, Carmody reported that the wooden fish traps of the Upper Murray were 'broken down or dragged out of the streams as flood debris, to be used for firewood'. The historical evidence suggests that wooden weir fish traps on anabranches of the main rivers and in creeks was a technology that was widely used by aboriginal people in the southern Murray-Darling Basin.

24.1.1 Boughyards in the Main Rivers

Another construction used by aboriginal people was wooden pens in the main channels of rivers, sometimes positioned near creeks. The structures acted as traps, but may also have been provided to enhance habitat and perhaps even conduct a form of aquaculture. While sometimes having permanent sections, they often contained a gap where a net could be placed, or a removable feature akin to a gate could be used to control the passage of fish. Thomas Mitchell first observed elaborate wooden structures in the main river channels in the Gwydir and Barwon Rivers in 1832:

> We had previously seen the osier nettings, erected by them across the various currents, and especially in the Gwydir, where some had been noticed of very neat workmanship. The frame of each trellis was as well squared as it had been the work of a carpenter, and the twigs were inserted, at regular intervals, so as to form, by crossing each other, a strong and efficient kind of net or snare. Where these were erected, a small opening was left towards the middle of the current, probably, that some bag or netting might be applied there to receive the fish, while natives in the river above should drive them towards it (Mitchell, 1838).

In 1836, Mitchell encountered similar but more elaborate structures in the Murray River near Swan Hill where one of his party 'observed in the channel he traced a net or fence of boughs which the natives had that morning set up' (Mitchell, 1838). Mitchell's description of the structures as fences or boughs, led to them being colloquially named as 'boughyards'. They were used extensively by the Yorta Yorta people of the Barmah Forest, with one reach of the river being named by Europeans as 'The Boughyards'. Edward Curr (1883) recorded their presence in the Moira area and indicated that individual structures were owned by specific families, with the reliable food supply supporting semi-permanent settlement. Oral history of the Yorta Yorta

suggests that these structures were not only used as traps, but may also have been used to improve habitat by providing additional cover for fish and spawning sites (Briggs, OH 70). Gilmore (1933, 1934) suggested that aboriginal people conducted a type of aquaculture operation in structures placed in the main river channels whereby large fish trapped in them would feed and grow upon the smaller fish that travelled into them.

24.1.2 Stone Fisheries

In early 1829 in 'New Years Creek', later known as the Bogan River, Charles Sturt encountered a stone weir about which he recorded in his journal 'It was evident that the creek had been numerously frequented by the natives, although no recent traces of them could be found. It had a bed of course red granite, of the fragments of which the natives had constructed a weir for the purpose of taking fish' (Sturt, 1833).

Extensive stone weirs were later discovered in the Barwon River near Brewarrina which have been the subject of much research and speculation. The Brewarrina stone fisheries, known to the local Ngemba people as 'Ngunnhu', are listed nationally as a site of cultural and historical significance. They consist of a series of rock barriers stretching over an area exceeding half a kilometre in length. Most historical and modern descriptions conclude that Ngunnhu is a feature, unique in the basin, which functioned as a fish trap capturing fish during upstream migrations, aboriginal people actively herding fish into the enclosures (Mathews, 1903, 1907; Barker & Mathews, 1988; Australian Government, 2003). Originally each 'trap' was owned by a specific family and individually named. R. H. Mathews provides a detailed description, plan and a photograph of these traps while they were still in good repair (Mathews, 1907). He also implied that other such structures were used by upstream tribes:

> There are about 8 chains more of the river floor containing fragments of old fishing pens, but I did not include them in my survey, and therefore they do not appear on the plan. / The rock *F* is supposed to be haunted by evil spirits called *Wundurramala*. If a strange blackfellow were to interfere with the fishing pens, these spirits would cause some accident or sickness to befall him. The blank spaces on the plan were, in the olden days, studded with fishing pens, of which the wreckage is visible in many places in the shape of scattered boulders and indistinct outlines of former enclosures. But the whole of the river floor was not occupied with the maze of traps. A waterway had to be left for the fish to travel up to the catching pens of families located higher up-stream (Mathews, 1907).

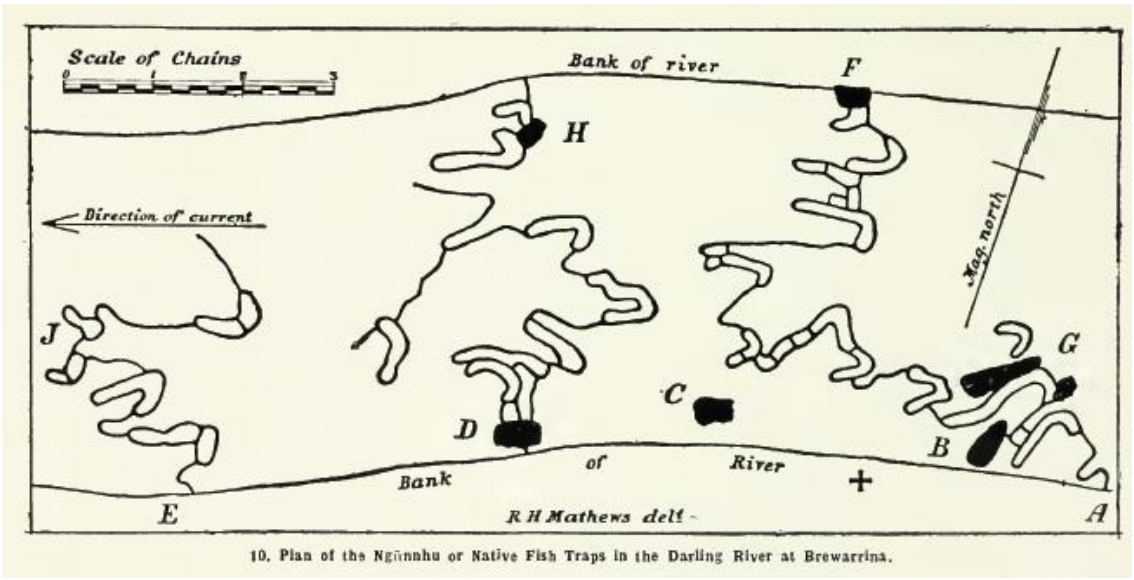
While aboriginal people were reported in the twentieth century to have taken fish from the Brewarrina stone fisheries, active interest in maintenance and management of the structures ceased after 1899 (*Sydney Morning Herald,* 30 October 1915).

In 1933, David Stead published an article in the *Sydney Morning* Herald describing the Brewarrina structure, concluding it to be a natural feature having undergone minor improvement by the aborigines and that its primary use was as a fish trap (*Sydney Morning Herald,* 30 September, 1933). Shortly afterward, Mary Gilmore responded to Stead's article in the paper (Gilmore, 1933) and in a radio interview where she said that Ngunnhu was not unique, but in fact part of a network of stone fisheries that existed throughout NSW. She went on to report that they were not managed as simple fish traps. Further details were provided later in a number of books that she published (Gilmore, 1934; 1935) and Gilmore's recollections are summarised below from all of these sources.

Photograph 24.1 Brewarrina Stone Fisheries

R. H. Mathews published this photograph of the Brewarrina stone fisheries in 1907 in his book *Notes on the Aborigines of NSW* at a time when it was still in good repair.

Figure 24.1 Brewarrina Stone Fisheries



10. Plan of the Ngūnnhu or Native Fish Traps in the Darling River at Brewarrina.

This plan of the Brewarrina Stone Fisheries was created by early ethnologist R. H. Mathews in 1901 who published a detailed history on them in 1903. He provided this plan in his book *Notes on the Aborigines of New South Wales* published in 1907.

Extensive stone fisheries once existed in the Clarence River, in the Barwon River at Brewarrina, the 'Upper Murray', the 'Upper Murrumbidgee', the Murrumbidgee River between Narrandera and Hay, the 'Lachlan River' (Gilmore, 1933) and at Wagga Wagga, as well as others of lesser stature in the Murrumbidgee (Gilmore, 1934; 1935). A significant trap also existed in the Bland Creek at McGregor's Station near Morangarell though Gilmore (1934) did not make it clear whether it was of stone or wooden construction. Gilmore spent her youth in the Wagga Wagga area and all of the locations reported by her to have the stone fisheries, with the exception of the Clarence River, were either in the territory of the Wiradjuri nation, at the boundaries of adjacent aboriginal groups, or within the land of those adjacent groups (Ngemba, Dhudhuroa, Ngnunawal and Nari Nari groups).

Gilmore witnessed the use of some these structures, and received first-hand accounts from her farther Donald Cameron who learnt from, and assisted the aborigines in their operations during the 1860-70's. The stone fisheries had three primary functions. Firstly, the larger examples were used to trap and then grow larger fish for planned large corroborees, which she termed 'inter-tribal gatherings', to sustain at times upwards of five thousand people for several weeks. Their operation involved planning two or three years before their anticipated use, with keystones being removed from the fisheries at least a year prior to the gathering allowing large fish to move into them. The keystones were then replaced, trapping the larger fish but allowing free passage of small fish into the fishery. The small fish provided a food source for the large ones which continued to grow. In addition, a large sanctuary was declared adjacent to the fishery to increase the populations of other food sources. Thus a guaranteed supply of large fish, kangaroos, possums and birds was on hand by the time of the gathering. Secondly, the fisheries were used as an emergency food supply by tribal groups passing through the territories of the local tribe. Thirdly, stone fisheries along with wooden baulks, partitioned the streams permitting management of the fishery (Gilmore, 1934).

Gilmore reported that the stone fisheries were removed to make the hearths of the fireplaces in the homes of European settlers (Gilmore, 1933) while others were blasted out by the desnagging crews clearing obstacles from the rivers for riverboat passage (Gilmore, 1934). The Brewarrina trap probably survived because it was upstream of the routes used by the paddle steamers. From observations of aboriginal management of the large fisheries, some white settlers knew in advance of the large gatherings that would occur. This knowledge sometimes resulted in corroborees being the sites of some massacres. This association and concerns about native title implications have led to residents being hesitant about providing history and locations for these structures, limiting our knowledge of them. Gilmore (1934) indicated that the last use of a fishery for an inter-tribal gathering was on the Bland Creek in 1879. Later authors recorded gatherings at the Brewarrina fishery, but these appear to have been the survivors of the local tribe rather than the traditional inter-tribal meetings of the past.

It appears that the recollections of Mary Gilmore were dismissed by many people at the time as being unreliable or exaggerated, with some newspaper correspondents disputing some of her claims about aboriginal people and dismissing the existence of stone fisheries other than those at Brewarrina. Two pieces of evidence support Gilmore's accounts of stone fisheries being more widespread than just at Brewarrina. Firstly, Jean Carmody provided a matching account recording the existence of a large stone fishery in the Upper Murray River where inter-tribal meetings took place as well as smaller examples of get-togethers. This account was sourced from early settlers, including members of the Mildren family who arrived in the area in 1863. Her account includes details not supplied by Gilmore suggesting its independence:

> Often, on long stretches of open water, stone traps were made, with the inclusion where possible of overhanging rocky outcrops for added strength. These traps were set so cleverly that they could not be swept away by the swiftest current or clogged up with silt at times of flood. Not only were these traps built to give the

> aborigines a change of diet, but they were especially used at times of inter-tribal conferences, the Upper Murray being one of the centres where these large gatherings took place periodically. To ensure a plentiful supply of fish for the participating tribes, the trap would be closed with a special key stone twelve months beforehand. This would allow small fish through, holding back the adult fish, which were later 'harvested'. In addition, the surrounding countryside would be left undisturbed, to guarantee a supply of wild game at the time of the meeting (Carmody, 1981).

Secondly, physical evidence remains of one of the stone traps described by Mary Gilmore in the Central Murrumbidgee River. Mac Hardie, a retired sleeper cutter at Darlington Point, has provided the author with a photograph of the remains of a stone fish trap in the Murrumbidgee River that is visible in very low water conditions. Mac, supported by other residents, recalled the oral history of it being constructed by aboriginal people. The author has been provided, in confidence, details about stone fisheries at other locations. He has speculated that due to the depth of water present within it, the aboriginal people may have used it for growing fish rather than simply trapping and spearing them. Mac has suggested that the large extensive trap used for inter-tribal meetings reported by Mary Gilmore may have been located near Carathool where the river passes over a bar creating a natural barrier and upstream pool (Mac Hardie, pers. com.). This matches Gilmore's description of it being located between Narrandera and Hay, with the extensive anabranch and lagoon system mentioned also present (Gilmore, 1934). R. H. Mathews (1907) implication that other stone fisheries were operated by tribes upstream of Brewarrina also supports Gilmore's accounts.

Photograph 24.2 Central Murrumbidgee River Stone Fishery

This image records the remains of an aboriginal stone fishery in the Central Murrumbidgee River and validates the accounts provided by Mary Gilmore of these structures being present in rivers throughout the Murray-Darling Basin. Photo courtesy of Mac Hardie.

These pieces of evidence triangulate Mary Gilmore's accounts which indicate that there was a network of stone fisheries in the Murray-Darling Basin. Some were operated as aquaculture grow-out systems and used to

support intertribal meetings. Oral tradition sourced from a number of people by the author, suggests that large stone fisheries existed in the Upper Murray as well as near Canberra or Cooma. It appears that smaller traps, alluded to by Gilmore as existing in the Murrumbidgee River, were common in some areas such as the Upper Murray River, this is supported by Carmody (1981). An aquaculture system growing eels within stone enclosures was used by the Gunditj Mara people in the Lake Condah area of western Victoria, and substantial physical evidence of this practice survives (Lourandos, 1997). It is clear from the accounts of the operation of wooden boughyards and stone fisheries that aboriginal people in the larger rivers of the Murray-Darling Basin conducted an equivalent form of aquaculture.

24.1.3 Management Practices

A number of early European accounts, including those of Beveridge (1889), considered the netting practice of aborigines to be wasteful, with unused small fish left to rot. Other accounts such as that of Blandowski (1858) indicate that even the small fish captured by netting were at times used.

Mary Gilmore concluded that native fish as a resource were actively managed by aboriginal people. The large gatherings at the stone fisheries were described by Gilmore (1934) as 'intertribal conferences' which occurred not only for cultural celebrations, but also as conferences for resource management. At these times were formulated tribal boundaries, as well as securing agreements about regulations on the operation of sanctuaries, fishery closures, etc. The construction of barriers on lagoons and anabranches, as well as the smaller rock traps, took place in part to manage fish populations. In particular, she reported that aboriginal people had the belief that excessive numbers of large Murray cod were deleterious to the health of the fishery and that the creation of barriers restricting the movement of large cod allowed their impact to be ameliorated (Gilmore, 1933, 1934). This was a belief shared by some early commercial fishermen such as William Hill (Hill, OH 37) who may have acquired this view from the aborigines.

Gilmore identified specific locations where permanent or seasonal closures to fishing took place. Some of these places were the swamps adjacent to the Murrumbidgee River between Narrandera and Hay which were aboriginal 'sanctuaries' (Gilmore, 1933). In a chapter of her book *Old Ways* titled 'native sanctuaries', she identified a number of locations dedicated to the conservation of emus and waterfowl, and notes that 'each year a part of the area could be hunted or fished, but not the same part two seasons in succession'. These included Pregan Pregan Lagoon near Wagga Wagga and swamps near Ganmain, Deniliquin and Deepwater. Lakes Cargelligo and Cowal were also managed sanctuaries, with only one side of Cargelligo being opened to fishing annually. Lake Cowal was used as an alternative at times to manage the Cargelligo fishery sustainably (Gilmore, 1934). Other wildlife sanctuaries in the basin are listed in Gilmore's extensive works including some in the Monaro and upper Abercrombie River.

There is evidence that aboriginal people may have practiced stock enhancement of fisheries within the Murray-Darling Basin. Gilmore (1933, 1934) reported that aboriginal people translocated ova and small fish in coolamons to the permanent ponds created by fish-balks across ephemeral creeks. Larger fish were at times transported, with pairs of fish of the two sexes being placed to promote breeding (Gilmore, 1934). Yorta Yorta elder Donald Briggs recalled local aboriginal people to have stripped and fertilised the eggs of cod and placed them in specially built structures:

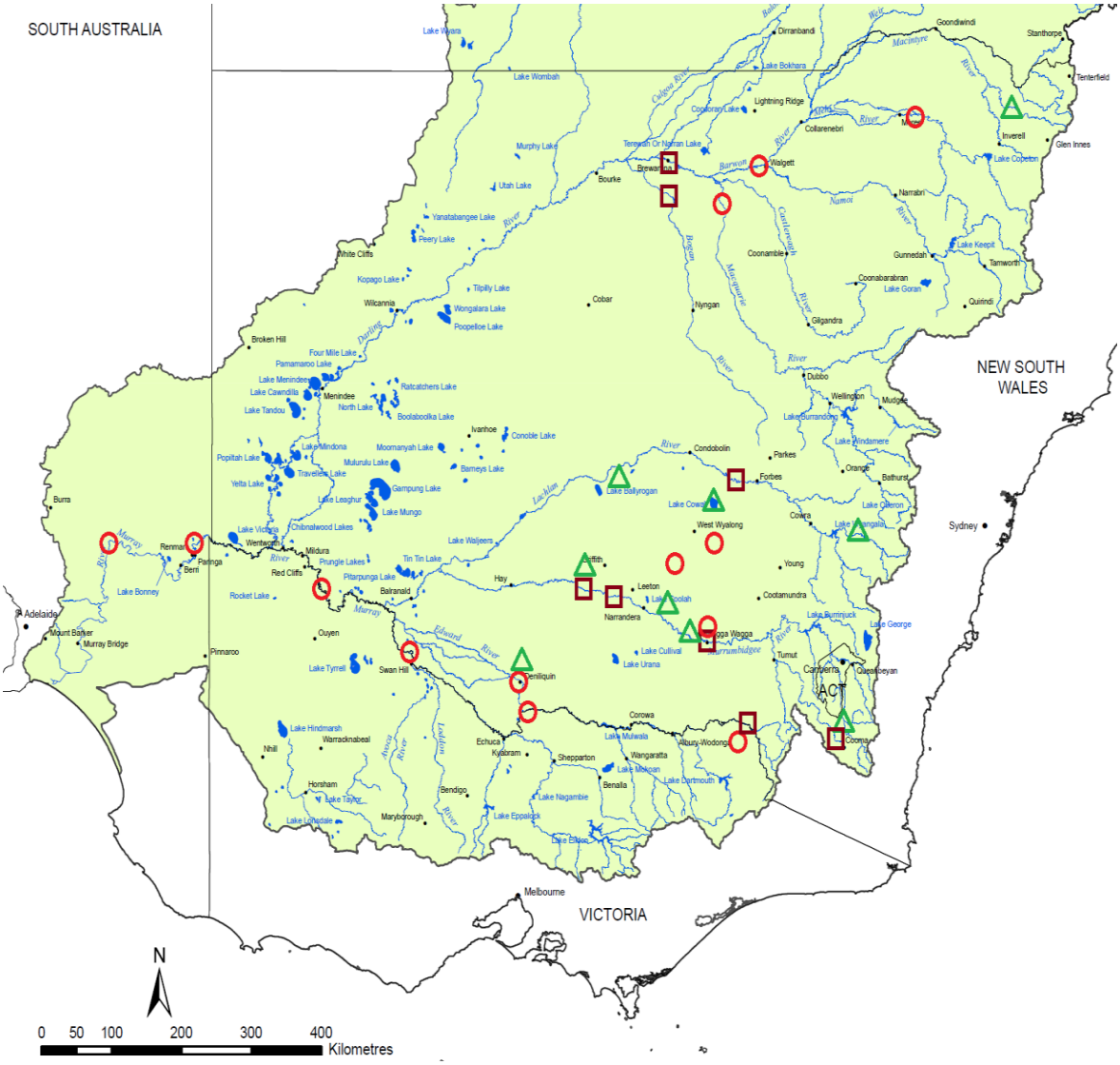
> In those days they would get the female cod in the breeding season and if they had the eggs, they would squirt the eggs out of the female into some logs and get the milt out of the males and put it on the eggs. They'd make up a yard out of the logs; protect it with branches, in a foot or so of water, only if the temperature was right.

> After 28 days the eggs and young cod would be gone. The old people did that for years. That was before any of the inspectors were doing it, in the 20's, dad told me about it. It had to be done at the right time during the floods, the fish used to go out there and do it themselves (Briggs, OH 70).

The first documented account on the artificial propagation of native fish occurred on the banks of the Murrumbidgee River near Oura in 1905, when Harald Dannevig successfully stripped and artificially fertilised cod eggs (NSW Fisheries Report, 1905; *Sydney Morning Herald,* 30 May 1905). It is possible that aboriginal people subsequently learnt this procedure from Europeans and applied it themselves. Gilmore's accounts, which date from the 1870s, indicate that aboriginal people had knowledge of the spawning sites of native fish and the ability to source ova for translocation purposes. Given this depth of understanding about the biology of native fish, it is plausible that aboriginals may have been propagating some species prior to the arrival of Europeans. At the very least, their translocation activities may have been responsible for the presence of some species in parts of the Basin, for example, Blackfish found upstream of large waterfall barriers today.

There is a general acknowledgement that aboriginal people modified some terrestrial Australian environments and that in some cases its health was dependent upon their management. The collective evidence, while limited, suggests that aboriginal people in the southern Murray-Darling Basin were active managers of the aquatic environment. Their practices over thousands of years through the setting aside of sanctuaries, modification of the environment, regulation of fish movement, management of large cod, and translocation activities may have had a significant impact on native fish populations. It was Mary Gilmore's contention that the health of the fishery was at least in part dependant on their management.

Figure 24.2 **Locations of Historical Accounts of Aboriginal Fishing Structures & Conservation Areas**



Locations of Historical Accounts of Aboriginal Fishing Structures & Conservation Areas

Wooden Weirs/Boughyards ○

Stone Fisheries □

Native Sanctuaries △

25 Recommendations

The residents of the Murray-Darling Basin live in an environment very different to that prior to the arrival of Europeans. In some cases the change is most apparent in the form of cleared land and degraded environments, all too obvious even to those without scientific training. Other changes are not obvious and it is only by comparison with hard evidence from the past that we recognise that change has transpired. The information collected and presented in this publication provides a picture, undeniably incomplete, of the former distribution and abundance of the larger native fish species in the southern Murray-Darling Basin. A comparison of the current status of native fish in the basin with the historical information confirms the assessment of the *Native Fish Strategy* that a dramatic decline has occurred and that the native fish populations of today are by comparison a small fraction of what existed at the time of European settlement. They have undergone not only a severe decline in abundance but also in their distribution and the range of habitats they once flourished in.

A large number of knowledge gaps remain in individual catchments and more historical research needs to be undertaken to establish, with what information survives, the original distribution and habitat associations of native fish. This project concentrated on the southern half of the Murray-Darling Basin and an equivalent project is warranted in the north. From the oral history collected in this project it is apparent that native fish had declined in many areas by the 1930s and therefore only the oldest of residents have recollections of the fishery prior to substantial change. With the passing of these people, knowledge is being lost and for this reason in this project it was the oldest residents that were identified for interview. In some areas no one remains with first-hand knowledge of the original fishery. Collecting further oral history is warranted in some catchments but with time, this approach for recording the early fish fauna will diminish in value. It is therefore urgent that people with first-hand knowledge of the fisheries of the 1920s in each catchment be identified and interviewed before they pass on, and their knowledge is lost. One area largely overlooked in this project was the collection of information on the smaller fish species which were not the target of anglers. Future oral history projects should attempt to record these species as well as the larger ones.

After museum specimens, the two most powerful records for the occurrence of native fish in specific waters are photographs and newspapers. Photographs, when of high quality, and whose source is reliably known, provide tangible proof of a species presence in a water. Over 400 photographs were located during the course of this project, but it is likely that a much greater number reside in private hands, remaining unidentified. These could provide critical evidence of the past presence of fish species in some catchments. Most photographs are likely to be of large cod and are of limited historical value. Those recording catches of fish dating prior to the Second World War represent high quality records and their value increases significantly with age. The photographic record is disappearing as families dispose of old apparently worthless photos, and original prints in the possession of historical societies deteriorate. A concerted public campaign to locate photographs of catches of native fish dating from the 1930s and earlier is strongly recommended and should be initiated as soon as possible by government agencies.

Newspapers also provide valuable information on the past presence of native fish though the use of common names can make the identification of some species difficult. The current project by the *National Library of Australia* to make available electronically major newspapers is producing many new records of native fish as well as identifying records of changes to fish populations and environments. It is recommended that ongoing searching be continued in the future, particularly as regional newspapers become available, and that ultimately a publication or database identifying all accounts be produced. Production of an updated version of

this document incorporating all significant newspaper records of native fish upon the completion of scanning by the *National Library of Australia* is recommended.

A focus of this project was to provide information to assist in the development of rarity scores for the *Sustainable Rivers Audit.* While different criteria were used to develop scores, there was an attempt to make them comparable to those used in the audit. There will always be some difficulty in making a comparison between angler catches and assessment of fish populations using ecological survey techniques, but the definitions developed in this project may be a useful guide for future projects assessing fish stocks from historical sources. One area of difficulty is determining rarity scores for species that in some areas had a strong presence in lagoon habitats but were often scarce in the main river channels such as Catfish and Blackfish in lowland areas. By defining rarity scores in terms of species abundance in main river channels they will sometimes significantly underestimate the past presence of species in catchments. Incorporating the presence of species in habitats away from the main channel in rarity scores, or developing a separate set of scores for these habitats, would provide a more accurate description of species abundance in the past.

The definition of habitat zones using altitude based criteria in the *Sustainable Rivers Audit*, while simple to apply, often does not reflect similarities in habitat between catchments. An example is the Goulburn River between Alexandra and Seymour, currently identified as lowland habitat, but physically resembling the Murrumbidgee River near Gundagai which is identified as slopes habitat. Introducing criteria other than altitude, such as gradient, flow, topography or substrate, to identify the habitat zones would provide a much better correlation of habitats between catchments and permit a better comparison of fish populations.

The following recommendations are made to help eliminate some knowledge gaps of the past distribution of native fish and consolidate or confirm existing records:

1. Conduct a project collecting and validating oral history and other historical records for native fish in the northern half of the Murray-Darling Basin;

2. Locate old photographs of catches of fish from the upper Macquarie and upper Lachlan Catchments. Photographic evidence will consolidate the existing evidence for Macquarie perch in the Macquarie Catchment and Trout cod in both catchments;

3. Locate further historical records, particularly photographs, for the upland zone of the Murrumbidgee River prior to 1910. Many existing records originated after the construction of Burrinjuck dam, which prevented upstream fish movement, and the massive translocation of fish from the lowlands. This will clarify the past abundance of most species in this reach for which there are limited records prior to 1910;

4. Collect additional information, including oral history, for the Broken Catchment. While some records were collected in this project, particularly upstream of Benalla, a large area encompassing the lowlands was not actively researched. The past abundance of Trout cod, Macquarie perch and Silver perch in the lowland zone of the Broken requires clarification;

5. Locate old photographs of catches of native fish from the Kiewa, Campaspe and Loddon Catchments. Photographic evidence will consolidate existing evidence for a number of fish species in these catchments;

6. Limited research was undertaken on the Murray River in South Australia in this project. The collection of oral history, particularly in the upper reaches, may clarify former abundance of a number of species

for which there is little known including Macquarie perch and Blackfish. In addition an oral history project based on the Mt Lofty streams may provide records for native fish in an area for which there are limited records.

There also needs to be an effort made to locate and collate the original descriptions of the various environments as they were prior to European settlement, presented in the form of a comprehensive, compact resource. Some peer reviewed papers and government publications make reference to these early descriptions and sometimes reproduce extracts from them. What is highly desirable is a resource where all of these accounts in a complete form are compiled into one work for an individual catchment to provide as complete a picture as possible of the original environment. Apart from aiding in the repair of our environment, having such information in the hands of the general public will increase awareness of current environment issues and the need for action.

The historical material collected and presented in this project demonstrates that non-lowland habitats contained substantial populations of large native fish. There is also accumulating evidence that a range of smaller native fish species, thought previously to be exclusively lowland, had a strong presence in higher altitude habitats. For example, 'Atherines' were documented as being present in Burrinjuck Dam and at Gulgong (NSW Fisheries Reports, 1901, 1914) at altitudes well above that previously reported. In terms of both small and large native fish species slopes and upland habitats, when reconsidered in light of the historical evidence collected in this project, appear to have been regions of high biological diversity in terms of their fish fauna and not devoid of angling sized fish, as some have repeatedly advocated. The implication of the past existence of prolific native fish populations in these habitats is that the challenge of meeting the goals of the *Native Fish Strategy* is going to be much greater, as the magnitude of the undertaking has increased significantly. Achieving these goals will require managing some waters upstream of the lowlands for the specific goal of restoring the original fish fauna so that representative examples of these unique fish assemblages are not lost forever, but survive for future generations to witness. This can only take place through the recognition of managers, anglers and the community at large, as to what has transpired and affirm the desire to achieve this outcome.

This project identified a number of probable sites where elaborate fish traps constructed by aboriginal people once existed. Native fish played a prominent role in the lives and spirituality of the first Australians from the lowlands upstream into the mountains. They were active managers of habitat, strategically placing structures in streams to enhance the environment for fish as well as facilitating their capture. Individuals anointed with totems for specific species of native fish were the custodians of a vital resource, charged with maintaining it sustainably. Recognition needs to be given to these aboriginal fishery sites, though the locations of some remain cryptic, whose importance should be acknowledged by the wider community. The loss of some aboriginal groups, particularly from the uplands, leaves all of us with the responsibility of guardianship for the native fish of their homelands, such as Trout cod and Macquarie perch.

The primary aim of this project was to determine the past distribution, abundance and habitat preferences of the Trout cod from historical sources. From the information compiled during the course of this project from all historical and contemporary sources, the following summary for Trout cod is presented and is recommended to be used in future publications:

Trout cod *Maccullochella macquariensis* (Cuvier, 1829)

Common names: Trout cod, rock cod, bluenose, Murray trout, 'Yaturr' (Jari Jari people of the lower Murray in Victoria), 'Ngumel' or 'Gnomell' (Wemba Wemba language of the Swan Hill region), 'Bangami' (Yorta Yorta language of the Barmah region), probably 'Inme' or 'Inna' (Yaithmathang or Gundungerre language of the Omeo region), possibly 'Yambuwa' (Dhudhuroa language of the upper Murray, lower Mitta Mitta and Kiewa Rivers) and 'Bewuck' (Yass/Tumut region).

A large, elongate, deep-bodied fish possessing an overhanging upper jaw when the mouth is closed. Coloration varies from light grey, grey-green or brown dorsally to white ventrally, becoming darker blue or livid grey in specimens from clear water. Markings generally in the form of small black or grey spots and dashes on the back and sides, usually with fewer on the head, larger specimens may be more heavily marked with spots covering the head. A horizontal head stripe passing through the eyes is often though not always present on smaller fish. In larger specimens a dark blue or black patch may be present on the snout and extend along the head between the eyes.

A top order carnivore feeding in the entire water column, the diet including crustaceans, fish, insects and occasionally terrestrial vertebrates. In smaller rivers and streams may actively feed at the surface on insects. A much smaller species than Murray cod, Trout cod were formerly very common up to 5 kg in weight, large individuals up to 22.7 kg have been captured and in excess of 30 kg reported. Individual growth rate is variable but can reach 2 kg per annum. There is evidence that juveniles may become dispersive prior to reaching maturity and that adults in larger rivers typically have a small home range of a few hundred meters though some may travel large distances. Fish become sexually mature at 3-5 years of age, with some individuals being reported to be mature as small as 25 cm in length. Spawning appears to be linked to water temperatures rising over 15°C and can take place from September to December depending on local conditions. The eggs are adhesive and believed to be laid on hard surfaces in cryptic locations.

Historically common to abundant in the faster reaches of large lowland rivers in areas of sand or clay substrate and in slopes, upland and some montane rivers and larger creeks of the Murray-Darling Basin from the Macquarie Catchment south. A characteristic species of slopes and upland rivers penetrating into lower montane habitats being recorded at altitudes up to 1100 metres ASL. Favours areas of flowing water containing cover in the form of wooden debris, rocks and underwater crevices and ledges with a preference in lowland rivers for deep water on the outside of bends. Now critically endangered, one wild and two translocated populations survived into the 1980s. Since 1988 hatchery produced fingerlings have been stocked into waters within its former range where reproducing populations have become established.

26 References

Acclimatisation Society of Victoria, (1864). *The Third Annual Report of the Acclimatisation Society of Victoria.* Melbourne: Wilson & Mackinnon.

Acclimatisation Society of Victoria, (1871). *Report of the Acclimatisation Society of Victoria.* Melbourne: Stillwell & Knight.

ACT Government, (1999). *Two-spined Blackfish (Gadopsis bispinosus): A vulnerable species.* Action Plan No. 11. Canberra: Environment ACT.

ACT Government, (2003). *Silver Perch (Bidyanus Bidyanus) - an endangered species*. Action Plan. No. 26. Canberra: Environment ACT.

Anderson, C (1931). A-Trouting We Will Go. *The Australian Museum Magazine*, 4 (6), April-June 1931: pp. 85-192.

Anderson, HK (1918). Rescue operations on the Murrumbidgee River. *Australian Zoologist,* 1: pp. 157-160.

Andrews, A (1920). *The First Settlement of the Upper Murray 1835 to 1845 with, A Short Account of over Two Hundred Runs 1835 to 1880.* Sydney: Ford.

Anon (1973). Native Fish in the Campaspe and Coliban Rivers. *Freshwater Fisheries Newsletter*, 5: pp. 18-19. Fisheries & Wildlife Division, Victoria.

Arentz, AF (1966). Acclimatization history covers 100 years. *The Fisherman,* 2 (5): pp. 8-10.

Astles, K (2001). Overview and knowledge gaps of cold water pollution in New South Wales. pp. 30-38 in Phillips, B (ed): *Thermal Pollution of the Murray-Darling Basin Waterways.* Sydney: Inland Rivers Network and World Wide Fund for Nature Australia.

Atkinson, J (1826). *An Account of the State of Agriculture & Grazing in New South Wales.* London: J. Cross.

Australian Government, (2003). Brewarrina Aboriginal Fish Traps (Baiame's Ngunnhu), New South Wales. Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Ayres, R. (2009). Population status of Macquarie Perch, Macquaria australasica, in King Parrot Creek, Victoria, in June 2009. Arthur Rylah Institute for Environmental Research. Confidential Client Report for the Goulburn Broken Catchment Management Authority. Department of Sustainability and Environment, Heidelberg, Victoria.

Bassett, J & Latch, J (1984). *Goorambat: yesterday and today*. Commissioned by the Goorambat Centenary Committee, to coincide with the Town's 1884-1984 celebrations, Newtown: Neptune, 1984.

Bearlin, AR & Tikel, D (2003). Conservation genetics of Murray-Darling Basin fish; silver perch (*Bidyanus bidyanus*), Murray cod (*Maccullochella peelii*), and trout cod (*M. macquariensis*). pp. 59-83 in: Phillips, B (ed)

Managing fish translocation and stocking in the Murray-Darling Basin workshop held in Canberra, 25-26 September 2002: Statement, recommendations and supporting papers. World Wildlife Fund, Australia.

Bennett, G (1834). *Wanderings in New South Wales, Batavia, Pedir Coast, Singapore and China; Being the Journal of a Naturalist in those Countries, During 1832, 1833, and 1834*. Vol 1. London: Bentley.

Bennett, G (1864). Notes on the River Cod and perch of the colonists. In: *Third Annual Report of the Acclimatization Society of New South Wales*.

Bennett, G (1867). pp. 49-50 in: Annual Report of the Acclimatisation Society of New South Wales. Sydney.

Berra, TM (1974). The Trout Cod, *Maccullochella macquariensis*, a rare freshwater fish of eastern Australia. *Biological Conservation,* 6 (1): pp. 53-56.

Berra , TM (1975). Two Cod species in the Murray-Darling System. *Australian Fisheries*, 34 (3): pp. 8-10.

Berra, TM & Weatherley, AH (1972). A systematic study of the Australian freshwater serranid fish genus *Maccullochella*. *Copeia*, 1972 (1): pp. 53-64.

Beveridge, P (1889). *The Aborigines of Victoria and Riverina as Seen by Peter Beveridge.* Melbourne: Hutchinson.

Bland, W (1831). *Journey of discovery to Port Phillip, New South Wales by Messrs W.H. Hovell and Hamilton Hume in 1824 and 1825*. Sydney: Hill. Facsimile edition, Libraries Board of South Australia, Adelaide, 1965.

Boulenger, GA (1895). *Catalogue of the Perciform Fishes in the Museum.* Second Edition. London: Brittish Museum Trustees.

Boulton, A, Berney, P & Panizzon, D, (2004). More than just a good story: Lessons learnt from oral histories of Australian rivers. pp. 108-113 in: *Proceedings of the 4th Australian Stream Management Conference, 19-22 October, Launceston, Tasmania.*

Bowe, H & Morey, S (1999). *The Yorta Yorta (Bangerang) language of the Murray Goulburn : including Yabula Yabula.* Australian National University. Research School of Pacific and Asian Studies. Pacific Linguistics. Canberra: Pacific Linguistics.

Bride, TF & Sayers, CE (1969). *Letters from Victorian Pioneers: Being a Series of Papers on the Early Occupation of the Colony, the Aborigines, Etc. Addressed by Victorian Pioneers to His Excellency Charles Joseph La Trobe, Lieutenant Governor of the Colony of Victoria.* Melbourne: Heinemann.

Brough-Smyth, R (1869). *Goldfields and Mineral Districts of Victoria.* Melbourne: Government Printer.

Brown, AM. & Nicol. S (1998). Draft Trout cod Recovery Plan Final Report to Environment Australia. *Department of Natural Resources and Environment*, Melbourne.

Brown, AM, Nicol S & Koehn J (1998) Recovery plan for the Trout cod *Maccullochella macquariensis* Aquatic Ecosse Pty. Ltd. and Department of Natural Resources and Environment, September 1998.

Brown, CM & Radke, BM (1989). Stratigraphy and sedimentology of mid-Tertiary permeability barriers in the subsurface of the Murray Basin, southeastern Australia. *Bureau of Mineral Resources Journal of Australian Geology & Geophysics,* 11: pp. 367-385

Brown, P & Douglas, J (2001). *Aquatic Habitat Rehabilitation for Trout Cod in Seven Creeks.* MAFRI Freshwater Fisheries Report No. 01/02 for the Goulburn Broken Catchment Management Authority.

Brumley, A R (1987). Past and present distributions of golden perch *Macquaria ambigua* (Pisces: Percichthyidae) in Victoria, with reference to releases of hatchery-produced fry. *Proceedings of the Royal Society of Victoria*, 99 (3): pp. 111-116.

Butcher, AD (1967). A changing aquatic fauna in a changing environment. *Proceedings and Papers of IUCN 10th Technical Meeting, Lucerne, June 1966; Part 1 - Changes due to introduced species; Section 2 - Ecological effects of introduced animal species. IUCN Publications (New Series)* No. 9: 197-218.

Cadwallader, PL (1977). J. O. Langtry's 1949-50 Murray River investigations. *Fisheries and Wildlife Paper, Victoria.* 13.

Cadwallader, PL (1978). Some causes of the decline in range and abundance of native fish in the Murray-Darling River system. *Proceedings of the Royal Society of Victoria,* 90: pp. 211-224.

Cadwallader, PL (1979). Distribution of native and introduced fish in the Seven Creeks River system, Victoria. *Australian Journal of Ecology,* 4: pp. 361-385.

Cadwallader, PL (1981). Past and present distributions and translocations of Macquarie perch *Macquaria australasica* (Pisces: Percichthyidae), with particular reference to Victoria. *Proceedings of the Royal Society of Victoria*, 93: pp. 23-30.

Cadwallader, PL (1996): *Overview of the impacts of introduced salmonids on Australian native fauna*. Canberra: Environment Australia.

Cadwallader, PL & Rogan, PL (1977). The Macquarie Perch, *Macquaria australasica* (Pisces: Percichthyidae), of Lake Eildon, Victoria. *Australian Journal of Ecology,* 2: pp. 409-418.

Cadwallader, PL & Gooley, GJ (1984). Past and present distributions and translocations of Murray cod and trout cod (Pisces: Perchichthyidae), in Victoria. *Proceedings of the Royal Society of Victoria,* 96 (1): pp. 33-43.

Campbell, T, Lytton, E, Hall, S, Hook, T, Ainsworth, W, Hood, T, & Ainsworth, W, (1828). *Rambles in New South Wales. Letter IX.* In: *The New Monthly Magazine and Literary Journal.* 1828, part 1. pp. 540-544. London: Colburn.

Carmody, J. (1981). *Early Days of the Upper Murray.* Wangaratta: Shoestring Press.

Castelnau, FL (1872). Contribution to the Ichthyology of Australia. No. I: The Melbourne fish Market (pp. 29-242). No. II.-Note on some South Australian fishes (pp. 243-247). *Proceedings of the Zoological and Acclimmatisation Society of Victoria*, 1: pp. 29-247.

Castelnau, FL (1873). Contribution to the ichthyology of Australia. *Proceedings of the Royal Zoological & Acclimatisation Society of Victoria,* 2: pp. 150-151.

Chambers, D (1985). *Violet Town or Honeysuckle in Australia Felix 1836-1908*. Carlton: Melbourne University Press.

Clark, ID (1998). *The Journals of George Augustus Robinson, Chief Protector, Port Phillip Aboriginal Protectorate. Volume Four: 1 January 1844 – 24 October 1845.* Melbourne: Clarendon Heritage Matters.

Clark, ID (2000). *The Papers of George Augustus Robinson, Chief Protector, Port Phillip Aboriginal Protectorate. Volume Two: Aboriginal Vocabularies: South East Australia, 1839-1852.* Melbourne: Clarendon Heritage Matters.

Clarke, WB (1860). *Researches in the Southern Goldfields of New South Wales.* Sydney: Reading & Wellbank.

Clements, J (1988). *Salmon at the Antipodes. A History and Review of the Trout, Salmon and Char, and Introduced Coarse Fish in Australia.* Ballarat: John Clements.

Clunie, P & Koehn, J (2001a). *Freshwater Catfish: A Resource Document.* Final Report for Natural Resource Management Strategy Project R7002 to the Murray Darling Basin Commission, Arthur Rylah Institute for Environmental Research, Department of Natural Resources and Environment, Heidelberg.

Clunie, P & Koehn, J (2001b). *Silver Perch: A Resource Document.* Final Report for Natural Resource Management Strategy Project R7002 to the Murray Darling Basin Commission, Arthur Rylah Institute for Environmental Research, Department of Natural Resources and Environment, Heidelberg.

Cole, CF (1908). Observations on the Cormorants along the Coast and in the Inland Waters of Victoria. *Emu*, 8: pp. 76-78.

Conservation Council of Victoria, (1977). *River Improvement?* Environment Awareness Publication #2.

Copeland, C, Schooneveldt-Reid, E, & Neller, S (2003). *Fish everywhere: An oral history of fish and their habitats in the Gwydir River.* Ballina: NSW Fisheries.

Crabb, P (1997). *Murray-Darling Basin resources*. Canberra: Murray-Darling Basin Commission.

Cunningham, A (1815). A Journey into the Interior of New South Wales, across the Blue Mountains – performed by his Excellency Colonel MacQuarrie, Governor of the Settlement. From an Official Account, dated Sydney, dated June 10, 1815. In: *The Scots Magazine Literary Miscellany.* 1816, Vol. LXXVIII, Ruthven and Sons.

Cunningham, A (1825). *Journal of a Route from Bathurst to Liverpool Plains, in New South Wales.* pp. 131- 193 in Field, B (ed.); Geographical Memoirs on New South Wales by Various Hands. London: John Murray.

Cunningham, P (1827). *Two Years in New South Wales: A Series of Letters, Comprising Sketches of the Actual State of Society in that Colony; of its Peculiar Advantages to Emigrants; of its Topography, Natural History, &c. &c.* Vol.1. London: Henry Colburn.

Curr, E (1883). *Recollections of squatting in Victoria, then called the Port Phillip District (from 1841 to 1851)*. Melbourne: George Robertson.

Currie, MJ (1825). *Journal of an Excursion to the Southward of Lake George in New South Wales.* In: Field, B (ed.) Geographical Memoirs on New South Wales by Various Hands. London: John Murray.

Cuvier, G (1829). In: Cuvier, G. and A. Valenciennes, 1829. *Histoire naturelle des poissons*. Tome troisième. Suite du Livre troisième. Des percoïdes à dorsale unique à sept rayons branchiaux et à dents en velours ou en cardes. v. 3: i-xxviii + 2 pp. + 1-500, Pls. 41-71. Paris.

Cuvier, G & Valenciennes, A (1830). *Histoire naturelle des poissons*. Tome cinquième. Livre cinquième. Des Sciénoïdes. v. 5: i-xxviii + 1-499 + 4 pp., Pls. 100-140. (Cvier authored volume. i-xx + 1-374 in Strasbourg edition.) p. 377, Pl. 131 Hist. Nat. Poiss. v. 5.

Dakin, WJ & Kesteven, GL (1938). The Murray Cod *(Maccullochella macquariensis)* (Cuv. Et Val.). *NSW Chief Secretary's Department, Fisheries Research Bulletin, No. 1.*

Dannevig, HC (1903). Summary of evidence regarding the Murray cod fisheries, with notes. In: *Murray Cod Fisheries. Extracts of Evidence collected by the South Australian Authorities during October 1900 with Notes.* Sydney: New South Wales Department of Fisheries.

Davidson, BJ (1968). Scrubworming the Bidgee. *Angler's Digest*, December 1968.

Davies, PE, Harris, JH, Hillman TJ & Walker, KF (2008). *SRA Report 1: A Report on the Ecological Health of Rivers in the Murray–Darling Basin, 2004–2007.* Prepared by the Independent Sustainable Rivers Audit Group for the Murray–Darling Basin Ministerial Council. MDBC Publication No. 16/08

Davis, JA. & Finlayson, B (2000). *Sand slugs and stream degradation: the case of the Granite Creeks, north-east Victoria.* Cooperative Research Centre for Freshwater Ecology Technical Report 7/2000.

Davis, KM, Dixon PI & Harris, JH (1999). Allozyme and mitochondrial DNA analysis of carp, *Cyprinus carpio* L., from south-eastern Australia. *Marine and Freshwater Research***,** 50 (3): pp. 253-260.

DeRose, R, Prosser, IP, Wilkinson, LJ, Hughes, AO & Young, WJ (2003). *Regional patterns of erosion and sediment and nutrient transport in the Goulbourn and Broken River catchments, Victoria*. CSIRO Land and Water. Technical Report 11/03, March 2003.

Douglas, JW & Brown, P (2000). Notes on the successful spawning and recruitment of a stocked population of the endangered Australian freshwater fish, Trout cod, *Maccullochella macquariensis* (Cuvier) (Percichthyidae). *Proceedings of the Linnaean Society of New South Wales,* 122: pp.143-147.

Douglas, JW, Gooley, GJ & Ingram, BA (1994). Trout cod, *Maccullochella macquariensis* (Cuvier) (Pisces: Percichthyidae), Resource Handbook and Research and Recovery Plan. Department of Conservation and Natural Resources Victorian Fisheries Research Institute, Snobs Creek.

Douglas, J, Giles, A & Strongman, R (2002). Lake Dartmouth Multi-species Fisheries Assessment. *Marine & Freshwater Resources Institute Freshwater Fisheries Report No.* 02/2. Department of Natural Resources and Environment, Victoria

Dufty, S., (1986). *Genetic and morphological divergence between populations of Macquarie Perch (Macquaria australasica) east and west of the Great Dividing Range*. Unpublished BSc. (Hons) thesis, University of New South Wales, Kensington.

Eaton, JHO (1945). *A Short History of the River Murray Works.* River Murray Commission. Adelaide: Government Printer.

Ebner, BC (2006). Murray cod: an apex predator in the Murray River, Australia. *Ecology of Freshwater Fish*, 15: pp. 510-520.

Ebner, B & Thiem, J (2006). Movement of hatchery-reared and wild-reared *Maccullochella macquariensis* stocked in a large lowland river. pp. 29-49 in: Ebner, B, Thiem, J, Lintermans, M & Gilligan, D (eds.) *An ecological approach to re-establishing Australian freshwater cod populations: an application to trout cod in the Murrumbidgee catchment*. Final Report to the Fisheries Research and Development Corporation (Project No. 2003/034). Canberra: Parks, Conservation & Lands.

Ebner, B, Johnston, L & Lintermans, M (2005). *Re-introduction of Trout Cod into the Cotter River Catchment. Final Report to the Natural Heritage Trust*. Canberra: ACT Government.

Ebner, B, Lintermans, M, Thiem, J & Gilligan, D (2006). Final Discussion and Recommendations. In: *An ecological approach to re-establishing Australian freshwater cod populations: an application to trout cod in the Murrumbidgee catchment*. pp. 105-115 in: Ebner, B, Thiem, J, Lintermans, M & Gilligan, D. (eds.). Final Report to the Fisheries Research and Development Corporation (Project No.2003/034). Canberra: Parks, Conservation & Lands.

Ebner, BC, Thiem, JD & Lintermans, M (2007). Fate of 2 year-old, hatchery-reared trout cod Maccullochella macquariensis (Percichthyidae) stocked into two upland rivers. *Journal of Fish Biology*, 71, pp. 182-199.

Evans, G (1813). Assistant-Surveyor Evan's Journal, 1813–1814. In: Mackaness, G (1965) *Fourteen Journeys over the Blue Mountains of New South Wales. 1813-41*. Sydney: Horwitz-Grahame.

Faulks, LK, Gilligan, DM & Beheregaray, LB (2009). Evolution and maintenance of divergent lineages in an endangered freshwater fish, *Macquaria australasica. Conservation Genetics,* doi:10.1007/s10592-009-9936-7.

Faulks, LK, Gilligan, DM and Beheregaray, LB (2010). Clarifying an ambiguous evolutionary history: range-wide phylogeography of an Australian freshwater fish, golden perch (*Macquaria ambigua*). Journal of Biogeography, 37: pp. 1329–1340.

Flett, J (1979). *The History of Gold Discovery in Victoria*. Melbourne: Poppet Head Press.

Forsyth, R (1899). Unpublished diary. MS 8953, Box 912/3, Manuscripts Collection, State library of Victoria.

Franklin, M (1963). *Childhood at Brindabella: my first ten years.* London: Angus & Robertson.

Frazier, P, Page, K & Read, A (2005). Effects of Flow Regulation on Flow Regime in the Murrumbidgee River, South Eastern Australia: an assessment using a daily estimation hydrological model. *Australian Geographer*, 36 (3): pp. 301-314.

French, GA (1847). *Savage Life and Scenes in Australia and New Zealand*. Vol. 1. 2nd Ed. London: Smith, Elder and Co.

Gale, J (1927). Canberra. *History of and Legends Relating to the Federal Capital Territory of the Commonwealth of Australia*. Queanbeyan: Fallick and Sons. (Reprinted 1977, National Library of Australia).

Gallaher, WW (1937). *Black Bass Lore.* New York: Putnam's & sons.

GBCMA, (1999). *Draft Goulburn Broken Native Vegetation Management Strategy*. Goulburn Broken Catchment Management Authority, Shepparton.

Gehrke, P C, Brown, P, Schiller, CB, Moffat, DB & Bruce, AM (1995). River regulation and fish communities in the Murray-Darling river system, Australia. *Regulated Rivers, Research and Management*, 11: pp. 363-375.

Gilligan, DM (2005). *Fish communities of the Murrumbidgee catchment: Status and trends*. NSW Department of Primary Industries – Fisheries Final Report Series No. 75.

Gilligan D & Rayner T (2007). The distribution, spread, ecological impacts and potential control of carp in the upper Murray River. NSW Department of Primary Industries Fisheries Research Report No 14, NSW Department of Primary Industries, Cronulla.

Gilmore, M (1933). Aboriginal Science: Fish-Traps & Fish-Balks. *Sydney Morning Herald*, 8 November 1933

Gilmore, M (1934). *Old Days: Old Ways. A Book of Recollections.* Sydney: Angus & Robertson.

Gilmore, M (1935). *More Recollections.* Sydney: Angus & Robertson.

Gippel, CJ (1995). Environmental Hydraulics of Large Woody Debris in Streams and Rivers. *Journal of Environmental Engineering*, 121: pp. 388-395.

Gippel, CJ, Finlayson, BL & O'Neil, IC (1992). *The Hydraulic Basis for Snag Management.* Centre for Applied Hydrology, Department of Civil and Agricultural Engineering, University of Melbourne.

Gippel, CJ. & Lucas, R (2002), Review of Fluvial Geomorphology and Recent Environmental Changes. In: *EarthTech, 2002, River Murray - Yarrawonga-Echuca Action Plan, Specialist Review Attachments***,** report to Goulburn Broken Catchment Management Authority, Department of Land and Water Conservation and the Murray-Darling Basin Commission.

Gooley, GJ. & MacDonald, GL (1988). Preliminary study on the hormone-induced spawning of Macquarie Perch, Macquaria australasica (Cuvier) (Percichthyidae), from Lake Dartmouth, Victoria. Technical Report Series No. 80. Arthur Rylah Institute for Environmental Research, Heidelberg, Victoria.

Graham, J (1863). *Lawrence Struilby; or, Observations and Experiences During Twenty-Five Years of Bush-Life in Australia.* (Graham, J. Ed). London: Longman, Green, Longman, Roberts & Green.

Greenham, P (1981). *Murrumbidgee River aquatic ecology study*. Report to the National Capital Development Commission and the Department of the Capital Territory, Canberra.

Growns, I, Wooden, I and Schiller, C (2004). Use of instream habitat by trout cod *Maccullochella macquariensis* (Cuvier) in the Murrumbidgee River. *Pacific Conservation Biology,* 10: pp. 261-265.

Guérin-Méneville, FE (1829) & (1838). *Iconographie Du Regne Animal De Cuvier. Mammiferes, Oiseaux, Reptiles Et Poissons, Pour Servir D'Atlas a Tous Les Traites De Zoologie Par M. F. E. Guerin-Meneville .* Bureau de la Revue et Magazin de zoologie, Paris. Bailleuieere edition 1838.

Gunther, ACLG (1859). *Catalogue of the Acanthopterygian Fishes in the Collection of the British Museum.* Vol. 1. London: Brittish Museum Trustees.

Gunther, ACLG (1880). *An Introduction to the Study of Fishes.* Edinburgh: A. and C. Black.

Halsall, CW (1977). *Strathbogie Centenary 1877-1977: A History of Strathbogie.* Euroa: Strathbogie Centenary Celebrations Committee.

Halsall, CW (1979). The Seven Creeks Has Pleased a Host of Anglers. In: *A History of Sport in Euroa and District*. Euroa: Euroa Shire Council.

Hames, F, Raadik, T & Lyon, J (2010). Victorian Bushfire Recovery 18 Months On. *Native Fish Forum 2010.* Canberra: Murray Darling Basin Authority.

Hammer, MP & Walker, KF (2004). A catalogue of South Australian freshwater fishes including new records, range extensions and translocations. *Transactions of the Royal Society of South Australia.* 128: pp. 85-97.

Hammer, M, Wedderburn, S & van Weenen, J (2007). *Draft Action Plan for South Australian Freshwater Fishes: 2007- 2012.* Native Fish Australia (SA) Inc., Adelaide.

Harrison, R (1977). Macquarie Perch. *Fishing World*, December 1977: pp. 39-42.

Hawdon, J (1952). *The journal of a journey from New South Wales to Adelaide (the capital of South Australia) performed in 1838 by Mr. Joseph Hawdon.* Melbourne: Georgian House

Hercus, LA (1992). *Wembawemba Dictionary.* Canberra: Australian Institute of Aboriginal and Torres Strait Islander Studies.

Hills, ES (1946). Fossil Murray cod (*Maccullochella macquariensis*) from diatomaceous earths in New South Wales. *Records of the Australian Museum,* 21: pp. 380-382.

Hodge, H (1973). *The Hill End Story: A History of the Hill End –Tambaroora Goldfield Book 1.* Hill End Publications.

Hood, J (1853). *Australia and the East: Being a Journal Narrative of a Voyage to New South Wales in an Emigrant Ship with a Residence of Some Months in Sydney and the Bush, and the Route Home by Way of India and Egypt in the Years 1841 and 1842.* London: John Murray.

Howitt, W (1855). *Land, labour and gold; or, Two years in Victoria with visits to Sydney and Van Diemen's Land in Two Volumes*. Vol. I & II. London: Longman, Brown, Green and Longmans.

Humphries, P (2003). Blandowski misses out: ichthyological etiquette in 19th-century Australia. *Endeavour,* 27: pp. 160 -165.

Humphries, P (2005). Spawning time and early life history of Murray cod, *Maccullochella peelii peelii* (Mitchell) in an Australian river. *Environmental Biology of Fishes*, 72: pp. 393-407.

Humphries, P & Cook, RA (2004). *Campaspe Flow Manipulation Final Report*. Canberra: Department of Environment and Heritage.

Humphries, P & King, AJ (2004). *Drifting fish larvae in Murray-Darling Basin rivers: composition, spatial and temporal patterns and distance drifted.* In: Lintermans, M and Phillips, B. (eds.) Downstream Movement of Fish in the Murray-Darling Basin-workshop held in Canberra, 3-4 June 2003: Statement, recommendations and supporting papers. Canberra: Murray-Darling Basin Commission.

Humphries, P, King, AJ & Koehn, JD (1999). Fish, flows and floodplains: links between freshwater fish and their environment in the Murray-Darling River system, Australia. *Environmental Biology of Fishes,* 56: pp. 129-151.

Hughes, W (1852). *The Australian Colonies: Their Origin and Present Condition.* London: Longman, Brown, Green and Longmans.

Hungerford, R (ed.) (1971). *Guide to Trout Angling: with expert advice on all fresh water species*, Sydney: Pollard Publishing.

Hungerford, R (ed.) (1976). *Complete Book of Australian Fishing*. Sydney: Pollard Publishing

Ingram, BA. & Rimmer, MA (1992). Induced breeding and larval rearing of the endangered Australian freshwater fish trout cod, *Maccullochella macquariensis* (Cuvier) (Percichthyidae). *Aquaculture and Fisheries Management,* 24: pp. 7-17.

Jackson, JE, Raadik, TA, Lintermans, M & Hammer, M (2004). Alien salmonids in Australia: Impediments to effective impact management, and future directions. *New Zealand Journal of Marine and Freshwater Research* 38: pp. 447-455.

Jekabsons, M (2006). Return of the Bluenose. *Fishing World*, July 2006: pp. 52-54.

Jerry, DR (2005). Phylogeography of the freshwater catfish *Tandanus tandanus* (Plotosidae): a model species to understand evolution of the eastern Australian freshwater fish fauna. *Marine and Freshwater Research***,** 59: pp. 351-360.

Jerry, DR & Cairns, SC (1998). Morphological variation in the catadromous Australian bass, from seven geographically distinct riverine drainages. *Journal of Fish Biology*, 2: pp. 829-843.

Jerry, DR, Elphinstone, MS. & Baverstock, PR (2001). Phylogenetic Relationships of Australian Members of the Family Percichthyidae Inferred from Mitochondrial 12S rRNA Sequence Data. *Molecular Phylogenetics and Evolution*, 18: pp. 335-347.

Joseland, H (1921). *Angling in Australia and Elsewhere.* Sydney: Art in Australia limited.

Keam, R (1994). *The Impact of Trout in Australian Waters.* Australian Trout Foundation, Victoria.

Kean, J (2005). Blandowski's bad name*. Museum Victoria Magazine,* Summer 2005: pp. 14-15.

Kearns, WM (1822). *Copy of a journal of a tour to the coast about nine miles to the southward of Batemen's Bay; performed by Mr WM Kearns in 1822, accompanied by Messrs March and Packard, which tour was undertaken in consequence of the published account of the discovery of the Clyde.* NSW Colonial Secretary, Papers of Charles Throsby, including various journals of exploration 1922-24, 9/2744, Archives Authority of NSW.

Kennard, MJ and Pusey, BJ (1997). Tandanus tandanus. In: Pusey BJ, Arthington, AH & Kennard, MJ (eds.) *Biology and instream flow requirements of Queensland freshwater fishes*. Centre for Catchment and In-stream Research, Griffith University, Nathan, Qld.

Koehn, J & Nicol, S (1998). Habitats and movements of freshwater fish in the Murray-Darling Basin. In: Banens, R. J. & Lehane, R. (ed.) *Proceedings of the Inaugural river Environment Research Forum of the MDBC Natural Resources Management Strategy*. Canberra: Murray Darling Basin Commission.

Koehn, JD, Doeg, TJ, Harrington, DJ & Milledge, GA (1995). *The effects of Dartmouth Dam on the Aquatic Fauna of the Mitta Mitta River*. Report to the Murray Darling Basin Commission by the Arthur Rylah Institute for Environmental Research, Melbourne.

Koehn. J, Brumley, A & Gehrke. P (2000). *Managing the impacts of Carp*. Canberra: Bureau of Rural Sciences.

Koehn, JD & Harrington, DJ (2006). Environmental Conditions and Timing for the Spawning of Murray Cod (*Maccullochella peelii peelii*) and the Endangered Trout Cod (*M. Macquariensis*) in Southeastern Australian Rivers. *River Research & Applic*ations, 22: pp. 327-342.

Koehn, JD, Nicoll, SJ, McKenzie, JA, Lieschke, JA, Lyon, JP & Pomorin, K (2007). Spatial ecology of an endangered native Australian Percichthyid fish, the trout cod *Maccullochella macquariensis. Endangered Species Research*, 4: pp. 219-25.

Koster, W, Crook, D & Fairbrother, P (2004). *Surveys of fish communities in the lower Goulburn River.* Annual Report 2003/2004. Report to Goulburn Valley Association of Angling Clubs. Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment, Heidelberg.

Krefft, JLG (1868). Descriptions of some new Australian freshwater fishes. *Proceedings of the General Meetings for Scientific Business of the Zoological Society of London.* 3: pp. 942-944.

Kyneton Guardian, (1935). *History of Kyneton: compiled from the files of The Kyneton observer, 1856-1862, and the Kyneton guardian, 1863 et seq.* Kyneton: Kyneton Observer.

Lacepède, BGE (1802). *Histoire naturelle des poissons*. v. 4: i-xliv + 1-728, Pl. 1-16.

Lake. JS (1959). The freshwater fishes of New South Wales. *New South Wales State Fisheries Bulletin No. 5.*

Lake, JS (1967a). Rearing experiments with five species of Australian freshwater fishes. I. Inducement to spawning. *Australian Journal of Marine and Freshwater Research,* 18: pp. 137-153.

Lake. JS (1967b). Freshwater Fish of the Murray-Darling system: The native and introduced species. *State Fisheries of New South Wales Research Bulletin No. 7.*

Lake, J. S., (1967c). Principal Fishes of the Murray-Darling River System. In Weatherly, A. H. (ed.): *Australian Inland Waters and their Fauna.* Canberra: Australian National University Press.

Lake. JS (1971). *Freshwater Fishes and Rivers of Australia*. Sydney: Thomas Nelson.

Lang, JD (1837). *An Historical and Statistical Account of New South Wales both as a Penal Settlement and as a Brittish Colony*. Vol II, 2nd Edition. Edinburgh: Valpy.

Lang, JD (1852). *An Historical and Statistical Account of New South Wales Including a visit to the Gold Regions, Description of the Mines, with an Estimate of the Probable Results of the Great Discovery.* Vol II, 3rd Edition. London: Longman, Brown, Green and Longmans.

Langdon, JS, Humphrey, JD, Williams, LM, Hyatt, AD & Westbury, HA (1986). Fish virus isolation from Australian fish: iridovirus-like pathogen from redfin perch, *Perca fluviatilis*. *Journal of Fish Diseases,* 9: pp. 263-268.

Langdon, JS (1989). Experimental transmission and pathogenicity of epizootic haematopoietic necrosis virus (EHNV) in redfin perch, *Perca fluviatilis* (L.), and other teleosts. *Journal of Fish Diseases*, 12: pp. 295-310.

Lea-Scarlett, EJ (1972). *Gundaroo.* Canberra: Roebuck Society.

Lee, I (1925). *Early Explorers in Australia: From the log-books and Journals*. London: Methuen.

Lesson, RP (1825). Observations générales d'histoire naturelle, faites pendant un voyage dans les Montagnes-Bleues de la Nouvelle-Galles du Sud. *Annales des Sciences Naturelles*, Paris v. 6: pp. 241-266.

Lesson, RP (1826). In: L. I. Duperrey. *Voyage autour du monde execute par ordre du roi sur la corvette de La Majesté La Coquille, pendant les années 1822, 1823, 1824 et 1825. Histoire naturelle. Zoologie, Atlas.*

Lesson, RP (1828). General Observations in Natural History, made during a Journey among the Blue Mountains in New South Wales. pp. 156-168 in: *The Edinburgh New Philosophical Journal, October 1827- April 1828*. Edinburgh: Black, Bridge, Longman, Rees, Orme & Brown.

Lesson, RP (1830). Poissons. In: L. I. Duperrey. *Voyage autour du monde execute par ordre du roi sur la corvette de La Majesté La Coquille, pendant les années 1822, 1823, 1824 et 1825. Zoologie*. v. 2 (1), pp. 227-229

Lesson, RP (1846). *Note historique sur l'amiral Dumont d'Urville*. France: Henry Loustau et cie, Rochefort.

Lhotsky, J (1979). *A Journey from Sydney to the Australian Alps undertaken in the months of January, February and March, 1834.* Andrews, AE (ed.). Hobart: Blubber Head Press.

Ling, N (2003). *Rotenone: a review of its toxicity and use for fisheries management*. Science for Conservation Report 211. New Zealand Department of Conservation.

Lintermans, M (1995). *The status of Trout Cod Maccullochella macquariensis in Bendora Reservoir, ACT: Results of 1992/93 and 1995 monitoring*, internal report 95/4, ACT Parks and Conservation Service.

Lintermans, M. (1998). *The Ecology of the Two-spined Blackfish Gadopsis bispinosus (Pisces: Gadopsidae).* M Sc. thesis, Division of Botany and Zoology, Australian National University.

Lintermans, M (2000). *The Status of Fish in the Australian Capital Territory: A Review of Current Knowledge and Management Requirements*. Canberra: Environment ACT, Technical Report 15.

Lintermans, M (2002). *Fish in the Upper Murrumbidgee Catchment: A Review of Current Knowledge.* Canberra: Environment ACT.

Lintermans, M (2005). Sand Slugs and Fish Movement in the Murrumbidgee River: Can You Restore and Maintain Deepwater Habitats in Sediment-Impacted Large Rivers? In: Lintermans, M, Cottingham, P & O'Connor, R (eds.): *Native Fish Habitat Rehabilitation and Management in the Murray-Darling Basin; Statement, Recommendations and Supporting papers*. Workshop held in Albury, NSW, 10-11 February 2004. Canberra; Murray Darling Basin Commission.

Lintermans, M (2007). *Fishes of the Murray-Darling Basin: An Introductory Guide.* Canberra: Murray Darling Basin Commission.

Lintermans, M (2008) *The Status of Macquarie Perch Macquaria australasica in the Mongarlowe River in 2007 and 2008*. Consultants report to the Friends of the Mongarlowe River Inc.

Lintermans, M & Phillips, B (eds.), (2005). *Management of Murray Cod in the Murray-Darling Basin: Statement, recommendations and supporting papers*. Proceedings of a workshop held in Canberra ACT, 3-4 June 2004. Canberra: Murray-Darling Basin Commission.

Lintermans, M, Kukolic, K & Rutzou, T (1988). The status of the trout cod, *Maccullochella macquariensis*, in the Australian Capital Territory. *Victorian Naturalist,* 105: pp. 205-207.

Lintermans, M, Rutzou, T & Kukolic, K (1990). Introduced fish of the Canberra region-recent range expansions. pp. 50-60. in: Pollard, D (ed.) *Australian Society for Fish Biology Workshop: Introduced and Translocated Fishes and their Ecological Effects* Bureau of Rural Resources Proceedings No. 8. Canberra: Australian Government Publishing Service.

Lintermans, M, Rowland, SJ, Koehn, J, Butler, G, Simpson, R & Wooden, I, (2005). The status, threats and management of freshwater cod species *Maccullochella spp.* in Australia. pp. 77-87 in: Lintermans, M & Phillips, B (eds). *Management of Murray Cod in the Murray-Darling Basin: Statement, recommendations and supporting papers*. Proceedings of a workshop held in Canberra ACT, 3-4 June 2004. Canberra: Murray-Darling Basin Commission.

Llewellyn, LC (1968). Tagging gives answers to fish growth queries. *The Fisherman,* 3: 1-5. NSW State Fisheries.

Llewellyn, LC (1983). *The distribution of fish in New South Wales*. Australian Society for Limnology Special Publication No. 7.

Lloyd, B & Nunn, K (1987). *Bright gold : the story of the people and the gold of Bright and Wandiligong.* Brighton East: Histec Publications.

Lorimer, MS & Schoknecht, NR (1987). *A Study of the Land in the Campaspe River Catchment.* Department of Conservation, Forests and Lands, Victoria.

Lourandos, H (1997). *Continent of Hunter-Gatherers*. Melbourne: Cambridge University Press.

Lyon, JP & O'Connor, JP (2008). Smoke on the water: Can riverine fish populations recover following a catastrophic fire-related sediment slug? *Australian Ecology*, 33: pp. 794-806

MacDonald, CM (1978). Morphological and biochemical systematics of Australian freshwater and estuarine percichthyid fishes. *Australian Journal of Marine & Freshwater Research,* 29: pp. 667-698.

MacDonald, DA (1887). *Gum Boughs and Wattle Bloom, Gathered on Australian Hills and Plains.* London: Cassell.

Mackaness, G (1965). *Fourteen journeys over the Blue Mountains of New South Wales. 1813-41*. pp 17-32. Number 2, 'Assistant-Surveyor Evan's Journal, 1813-1814'. Sydney: Horwitz-Grahame.

Macleay, W (1881). A descriptive catalogue of Australian fishes. Proceedings of the Linnean Society of NSW. 6 (2): pp. 202-387.

Macleay, W (1885). New Fishes from the Upper Murrumbidgee. Proceedings of the Linnean Society of NSW. 10: pp. 267-269 and notes on 246.

Mallen-Cooper, M (1993). Habitat changes and declines of freshwater fish in Australia: what is the evidence and do we need more? pp. 118-123 in Hancock, D (Ed), Australian Society for Fish Biology Workshop on Sustaining fisheries through sustaining habitat. Canberra: Australian Government Publishing Service.

Marett, FJ (1943). Fishing for Murray cod. *Walkabout,* 1 December 1943

Marsden, HG (1922). *Across the Alps to Omeo: In Commemoration of the Fiftieth Anniversary of the Formation of the Shire this Booklet is Issued by the Omeo Shire Council 1972-1922.* Omeo Shire Council.

Martin, T (1858). Early history of Newstead district. Unpublished manuscript, State Library of Victoria manuscripts collection, MS 10794.

Mathews, RH (1903). The Aboriginal Fisheries of Brewarrina. *Journal of the Royal Society of NSW*, 37: pp. 150-153.

Mathews, RH. (1904). The Wiradyuri and other Languages of New South Wales. *Journal of the Anthropological Institute*, 34: pp. 284-305.

Mathews, RH (1907). *Notes on the Aborigines of NSW*. Sydney: W. A. Gullick, Government Printer.

Mathews, RH (1909). The Dhudhuroa language of Victoria', *American Anthropologist* 11: pp. 278-284.

McCoy, F (1879). *Prodromus of the Natural History of Victoria*. pp. 39-41 plus plates 27 and 86.

McCoy, F (1884). Oligorus Macquariensis. The Murray Cod-Perch. In: *Prodromus of the Natural History of Victoria*. pp. 19 -22 plus plates 85 and 86.

McCulloch, AR (1922). Check list of the fishes and fish-like animals of New South Wales. In: Zoological Handbook, no. 1. Sydney: Royal Zoological Society of New South Wales.

McGuckin, J & Doeg, T (2000). *Investigation of Aquatic Ecosystems of the Loddon Catchment*. Report prepared for North Central Catchment Management Authority as part of the Loddon River Health Recovery Plan.

McKinnon, LJ & Shepheard, N (1995). Factors contributing to a fish kill in the Broken Creek. *Victorian Naturalist*, 112, pp. 93-99.

MDBC (2004). *Native Fish Strategy for the Murray-Darling Basin 2003-2013*. Canberra: Murray Darling Basin Commission.

Merrick, JR & Schmida, GE (1984). *Australian Freshwater Fishes: Biology and Management.* South Australia: Griffin.

Miller, A, Waggy, G, Ryan, S. & Austin, C (2004). Mitochondrial 12S rRNA sequences support the existence of a third species of freshwater blackfish (Percicthyidae: *Gadopsis*) from south-eastern Australia, *Memoirs of Museum Victoria*, Vol 61, No 2, pp. 121-127, Museum Board of Victoria, Australia.

Mitchell, FF (1926). *Back to Cooma celebrations, 20th February to 27th February, 1926*. Sydney: Direct Publicity Co. under the auspices of the Back to Cooma Executive Committee, 1926.

Mitchell, TL (1838). *Three expeditions into the interior of eastern Australia; with descriptions of the recently explored region of Australia Felix, and of the present colony of New South Wales*. Second edition, Vol. 1. London: T. & W. Boone.

Mitchell, TL (1848). *Journal of an expedition into the interior of tropical Australia, in search of a route from Sydney to the Gulf of Carpentaria*. London: Longman, Brown, Green and Longmans.

Morgan, H (1908). *Diary of Henry Morgan*, 1853-1908. Unpublished manuscript, State Library of Victoria, manuscripts collection, MS 12525.

Morris, EE (1898). *Austral English: A Dictionary of Australasian Words, Phrases & Usages.* London: Macmillan & Co.

Morrisy, NM (1970). Murray cod, *Maccullochella macquariensis,* in Western Australia. *Western Australian Naturalist*, 11: pp. 130-134.

Mossman, S & Banister, T (1853). *Australia Visited and Revisited: A Narrative of Recent Travels and Old Experiences in Victoria and New South Wales.* London: Addey & Co.

Mudie, I (1961). *RiverBoats.* Adelaide: Rigby.

Mulham, WE (1994). *The Best Crossing Place. Some Highlights of Life in Deniliquin and District During the Period 1859 to 1890, as Recorded in the Columns of the Deniliquin Pastoral Times.* Reliance Press.

Musyl, MK. & Keenan, CP (1992). Population genetics and zoogeography of Australian freshwater golden perch, *Macquaria ambigua* (Richardson 1845) (Teleostei: Percichthyidae), and electrophoretic identification of a new species from the Lake Eyre basin. *Australian Journal of Marine and Freshwater Research***,** 43(6): pp. 1585-1601.

Musyl, MK & Keenan, CP (1996). Evidence for cryptic speciation in Australian freshwater eel-tailed catfish, *Tandanus tandanus* (Teleostei: Plotosidae). *Copeia,* pp. 526-534.

National Murray Cod Recovery Team, (2010). *National Recovery Plan for the Murray Cod Maccullochella peelii peelii*. Department of Sustainability and Environment, Melbourne.

NCCMA, (2010). *Loddon River Environmental Watering Plan*. Prepared for the Northern Victoria Irrigation Renewal Project, North Central Catchment Management Authority, Huntly, Victoria.

Nicol, S, Lieschke, J, Lyon, J & Hughes, V (2002). Resnagging revolution: River habitat rehabilitation through resnagging. Melbourne: Department of Natural Resources and Environment.

Nicol, S & Todd, C (2004). Trout cod (Muccullochella macquariensis) in the Murray River, Southeast Australia. Prioritizing Rehabilitation Efforts. pp. 219-229 in: Akcakaya, HR, Burgman, MA, Kindvall, O, Wood, CC, Sjogren-Gulve, P, Hatfield, JS. & McCarthy, MA (eds.) *Species Conservation and Management: Case Studies*. Oxford University Press.

Nicol, SJ, Barker, RJ, Koehn, JD & Burgman, MA (2007). Structural habitat selection by the critically endangered trout cod, *Maccullochella macquariensis*, Cuvier. *Biological Conservation,* 138 (1–2): pp. 30–37.

Nock, CJ, Elphinstone, MS & Rowland, SJ, (2010). Phylogenetics and revised taxonomy of the Australian freshwater cod genus, Maccullochella (Percichthyidae). *Marine and Freshwater Research*, 61, pp. 980-991.

NSW, (1871). *The Industrial Progress of New South Wales being a Report on the Intercolonial Exhibition of 1870, at Sydney.* Sydney: Thomas Richards.

NSW Department of Primary Industries, (2006a). *Trout cod (Maccullochella macquariensis) recovery plan.* NSW DPI Port Stephens Fisheries Centre, Nelson Bay

NSW Department of Primary Industries, (2006b). *Silver perch (Bidyanus bidyanus) recovery plan.* NSW DPI Port Stephens Fisheries Centre, Nelson Bay.

NSW Government, (1880). *Report of the Royal Commission, appointed on the 8th of January,1880, to inquire into and report upon the actual state and prospect of the fisheries of this colony: together with the minutes of evidence, and appendices*. Sydney: Government Printer.

NSW Government, (1903). *Murray Cod Fisheries. Extracts of Evidence collected by the South Australian Authorities during October 1900 with Notes.* New South Wales Department of Fisheries.

NSW Fisheries Reports, various years. *Report on the Fisheries of New South Wales for the Year* cited. Sydney: New South Wales Legislative Assembly.

O'Connor. J (2006). *Assessment of the Broken Creek fishways installation program*. Report to Goulburn Catchment Management Authority. Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment, Heidelberg, Victoria. July 2006.

Ogilby, JD (1893). *Edible Fishes and Crustaceans of New South Wales.* Sydney: Government Printer.

Ogilby, JD (1913). Edible fishes of Queensland. Part II. The Gadopseiform percoids. *Memoirs of the Queensland Museum,* 2: pp. 67-80.

Oxley, J (1820). *Journals of two expeditions into the interior of New South Wales, undertaken by order of the British Government in the years 1817-18*. London: John Murray.

Paxton, JR, Hoese, DF, Allen, GR. and Henley, JE (1989). Zoological Catalogue of Australia. Volume 7 - Pisces: Petromyzontidae to Carangidae. Australian Government Printing Service, Canberra.

Pendergast, JV (1968). *Pioneers of the Omeo District.* Melbourne: J. V. Pendergast.

Perriss, S (2004). *The Goulburn Weir Fish Kill of January 2004*. Environment Protection Authority of Victoria Technical Report.

Phillips B (ed.) (2001). *Thermal Pollution of the Murray-Darling Basin Waterways: workshop held at Lake Hume 18-19 June 2001*. Inland Rivers Network and World Wide Fund for Nature, Sydney, NSW.

Pierce, AB (1849). *Knocking About: Being Some Adventures of Augustus Baker Peirce in Australia*. (Leatherbee, AT (ed.)). London: Humphrey Milford.

Pratt, B (1979). *The Canberra Fisherman.* Canberra: Australian National University Press.

Priestley, S (1965). *Echuca: A Centenary History.* Jacaranda Press.

Public Works Department Victoria, (1865). *Report from the Public works Department on the work done in clearing the River Murray, and expenses incurred in connexion therewith.* Victoria: Legislative Assembly.

Ramsay, EP (1881). Description of a new species of Therapon from the Macquarie River. *Proceedings of the Linnean society of NSW,* 6: pp. 831-833.

Ramsay, EP (1883). *Catalogue of the Exhibits in the N.S.W. Court of the Great International Fisheries Exhibition, South Kensington, London, 1883.* London: William Cloves & Sons.

Randall, JO (1976). *Kimbolton.* Carlton: Queesnbury Hill Press.

Randall, JO (1985). *McIvor: A History of the Shire and the Township of Heathcote.* Melbourne: Shire of McIvor.

Rees, G (2006). *Ecological implications of Azolla proliferation events in the Lower Broken Creek*. The Murray-Darling Freshwater Research Centre, Wodonga, Victoria. Report prepared for Goulburn Broken Catchment Management Authority. March 2006.

Reynolds, LF (1983). Migration patterns of five fish species in the Murray-Darling River system. *Journal of Marine & Freshwater Research,* 34: pp. 857-871.

Rhodes, JO (1999). *Heads and Tales: Recollections of a Fisheries and Wildlife Officer.* Melbourne: Australian Deer Research Foundation Ltd.

Richardson, J (1844-48). *Ichthyology of the voyage of H. M. S. Erebus and Terror, under the command of Captain Sir James Ross.* London: E. W. Janson.

Rimmer, MA (1987). Trout cod bred for the first time at Narrandera. *Australian Fisheries,* 46 (11): pp. 33-34.

Ritchie, J (1988). *The Australian Trout: its Introduction and Acclimatisation in Victorian Waters.* Melbourne: Victorian Fly-Fishers' Association.

Roberts, J & Sainty, G (1996). *Listening to the Lachlan*. Sainty & Associates, Potts Point, NSW.

Roberts, J & Sainty, G (1997). *Oral history as a tool in historical ecology: Lachlan River as a case study.* Canberra: CSIRO.

Robertson, M, Nichols, P, Horwitz, P, Bradby, K & MacKintosh, D (2000). Environmental narratives and the need for multiple perspectives to restore degraded landscapes in Australia. *Ecosystem Health,* 6: pp. 119-133.

Robinson, GA (1845). In: Clark, ID 1998 (ed.) *The Journals of George Augustus Robinson, Chief Protector, Port Phillip Aboriginal Protectorate. Vol. 4, 1 January 1844-24, October 1845*. Melbourne: Clarendon Heritage Matters.

Ross, Capt. Sir JC (1847). *A Voyage of Discovery and Research in the Southern and Antarctic Regions During the Years 1839-43.* Vols. 1 & 2. London: John Murray; reprint by Augustus M. Kelley, New York, 1969.

Roughley, TC (1951). *Fish and Fisheries of Australia.* Sydney: Angus & Robertson.

Roughley, TC (1955). *Fish and Fisheries of Australia.* Sydney: Angus & Robertson.

Rowland, SJ (1989). Aspects of the history and fishery of the Murray cod, *Maccullochella peeli* (Mitchell) (Percichthyidae). *Proceedings of the Linnean Society of New South Wales,* 113 (4): pp. 201-213.

Rowland, SJ (1993). *Maccullochella ikei,* an endangered species of freshwater cod (Pisces: Percichthyidae) from the Clarence River system, NSW and *M. peelii mariensis,* a new subspecies from the Mary River system, Qld. *Records of the Australian Museum,* 45: pp. 121-145.

Rowland, SJ (2005). *Overview of the history, fishery, biology and aquaculture of Murray cod (Maccullochella peelii peelii).* pp. 38-61 in: Lintermans, M & Phillips, B (eds). *Management of Murray Cod in the Murray-Darling Basin: Statement, recommendations and supporting papers*. Proceedings of a workshop held in Canberra ACT, 3-4 June 2004. Canberra: Murray-Darling Basin Commission.

Rowland, SJ & Ingram, BA (1991). *Diseases of Australian native freshwater fishes with particular emphasis on the ectoparasitic and fungal diseases of Murray cod (Maccullochella peeli), golden perch (Macquaria ambigua) and silver perch (Bidyanus bidyanus).* NSW Fisheries, Fisheries Bulletin No 4.

Russell, J & Long, K (2007). *Changing Climate - Changing Flooding - Transformation of the Eppalock Catchment.* Paper presented at the 5th Flood Management Conference held in Warnambool, 9-12 October 2007.

Ryan, T (2003) *How low can they go? Impacts of cold water releases on larval and juvenile native Murray-Darling Basin fish species*. Australian Society for Fish Biology, Annual Conference, New Zealand 2003, Abstracts.

Ryan, T, Webb, A, Lennie, R & Lyon, J (2001). *Status of Cold Water Releases from Victorian Dams.* Report produced for Catchment and Water, Department of Natural Resources and Environment. DNRE, Heidelberg, Victoria.

Saddlier, S (2001). *Birches Creek: Habitat rehabilitation for freshwater blackfish - Final Report*. Arthur Rylah Institute for Environmental Research and North Central Catchment Management Authority.

Sanger, AC (1984). Description of a new species of *Gadopsis* (Pisces: Gadopsidae) from Victoria. *Proceedings of the Royal Society of Victoria,* 96: pp. 93-97.

Schoknecht, N (1988). *Land Inventory of the Loddon River Catchment - a reconnaissance survey.* Department of Conservation, Forests and Lands, Victoria.

Scott, TD, Glover, CJM & Southcott, RV (1974). *The Marine and Freshwater Fishes of South Australia.* 2nd Edition. Adelaide: Government Printer.

Scott, A (2001). *Water erosion in the Murray-Darling Basin: Learning from the past.* CSIRO Land & Water Technical Report No 43/01, November 2001.

Scott, A (2005). *Historical evidence of native fish in the MDB at the time of European settlement, from the diaries of the first explorers.* Canberra: Cooperative Research Centre for Freshwater Ecology.

Sheikh-Eldin, M, De Silva, SS, Anderson, TA & Gooley, G (1995). Physical characteristics, and proximate composition of oocytes, liver and muscle of wild caught and tank-reared Macquarie Perch. *Aquaculture International* 3: pp. 172-185.

Shellard, F (1890). *Reminiscences of an old gold digger*. Unpublished manuscript, National Library of Australia manuscripts collection: MS 1890.

Shearer, KD & Mulley, JC (1978). The introduction and distribution of the Carp, *Cyprinus carpio* Linnaeus, in Australia. *Australian Journal of Marine and Freshwater Research*, 29: pp. 551-563.

Sherman, B (2000). Scoping options for Mitigating Coldwater Discharges from Dams. Consultancy Report 00/21, May 2000. Canberra: CSIRO Land and Water.

Shumack, JE & Shumack, S (eds) (1967). *An autobiography, or tales and legends of Canberra pioneers.* Canberra: Australian National University Press.

Sinclair Knight Merz, (2003). Review of Habitat Associations of Native Fish in the Murray Darling Basin. Murray Darling Basin Commission Project R2105. Final Report.

SKM, (1996). *A Management Strategy for Broken Creek, Study Report, Stage 1, Vol. 1 & 2.* Lower Goulburn Waterway Management Authority, Sinclair Knight Merz, Armidale, Vic.

Smith, CT (1820). *Extract from a Journal kept by Charles Smith Between the 3rd to 10th Days of December 1820.* NSW Colonial Secretary, Logs, diaries and Journals of Exploration, Fiche 3271, Bundle 14 No. 103, Archives Authority of NSW.

Starr, BJ, Wasson, RJ & Caitcheon, G (1999). *Soil erosion, phosphorus & dryland salinity in the Upper Murrumbidgee; past changes and current findings*. Report Prepared for the Upper Murrumbidgee Catchment Co-ordinating Committee.

Stead, DG (1903). A description of the Gear used on the Murray; with Notes on the Natural Enemies of the Murray Cod, and on the various Fishes, Crustacea, &c., captured or mentioned. In: *Murray Cod Fisheries. Extracts of Evidence collected by the South Australian Authorities during October 1900 with Notes.* New South Wales Department of Fisheries.

Stead, DG (1908). *Edible Fishes of New South Wales.* Sydney: Government Printer.

Stead, DG (1913). An account of some experiments on the acclimatisation of two species of Australian freshwater perch. *Report of the Australasian Association for the Advancement of Science*. 14: pp. 279-288.

Stead, DG (1929a). Introduction of the great carp *Cyprinus carpio* into waters of New South Wales. *Australian Zoologist,* 6: pp. 100-102.

Stead, DJ (1929b). The Murray Cod and the Trout Cod. *Sydney Mail,* 27 November 1929, p 17.

Stead, DG (1932). Australian Food and Game Fishes. *The Australian Geographer*, August 1932.

Stead, DG (1933). *Giants and Pigmies of the Deep.* Sydney: Shakespeare Head Press.

Stephenson, AE & Brown, CM (1989). The ancient Murray River system. *Bureau of Mineral Resources Journal of Australian Geology & Geophysics,* 11: pp. 387-395

Stevens, F (1969). *Smoke from the Hill: A Story of the Boort District 1836-1968.* Boort: Boort Historical Society.

Stodart, E & Parer I (1988). Colonisation of Australia by the rabbit**.** CSIRO Division of Wildlife and Ecology Project Report No. 6.

Sturt, C (1833). Two expeditions into the interior of southern Australia, during the years 1828, 1829, 1830 and 1831: with observations on the soil, climate and general resources of the colony of New South Wales. Vol. 2. London: Smith, Elder & Co.

Sturt, C (1990). *An Account of a Journey to South Australia 1838.* Adelaide: Published by Sullivan's Cove.

Symons, JC (1870). *Life of the Rev. Daniel James Draper, Representative of the Australian Conference Who was Lost in the "London," January 11th, 1866.* Melbourne: Wesleyan Book Depot.

Talbot, D (2004). *The Buckland Valley Goldfield.* Albury: Specialty Press.

Taylor, J (1823). *Journal of an Excursion Across the Blue Mountains of New South Wales. The London Magazine*, Vol VIII, November 1823. London: Taylor and Hessey.

Taylor, G, Walker, DH, Jones, NO & Hutka, J (1980). The nature and significance of lacustrine deposits near Bunyon, N.S.W. In, *Abstracts from Symposium on Cainozoic Evolution of Continental Southwest Australia, Canberra, November 1980*. pp. 66-67. Canberra: Bureau of Mineral Resources, Geology and Physics.

Tenison-Woods, Rev. JE (1882). *Fish and Fisheries of New South Wales*. Sydney: Government Printer.

Thiem, JD, Ebner, BC & Broadhurst, BT (2008). Diel activity of the endangered Trout Cod (*Maccullochella macquariensis*) in the Murrumbidgee River. *Proceedings of the Linnean Society of New South Wales,* 129: pp. 167-173.

Thomson, C (1994). The Impact of River Regulation on the Natural Flows of the Murray-Darling Basin. Technical Report 92/5.3. Canberra: Murray-Darling Basin Commission.

Todd, C & Ryan, T (2003). *Was population decline inevitable? Modelling the impacts of cold water releases on native fish.* In: Proceedings of the ASFB Invasive species: Fish and Fisheries Workshop, Australian Society for Fish Biology, Wellington, New Zealand, 29-30 June 2003.

Todd, CR, Nicol, SJ & Koehn, JD (2004). Density-dependence uncertainty in population models for the conservation management of trout cod Maccullochella macquariensis. *Ecological Modelling*, 171 (4): pp. 359-380.

Treadwell, S & Hardwick, R (2003). *Review of Habitat Associations of Native Fish in the Murray Darling Basin.* Murray-Darling Basin Commission Project R2105. Sinclair Knight Merz, Malvern, Australia.

Trout Cod Recovery Team, (2008). National Recovery Plan for the Trout Cod *Maccullochella macquariensis*. Melbourne: Department of Sustainability and Environment.

Trueman, WT (2006). Methods for the hatchery production of the Freshwater jewfish or Eel-tailed catfish *Tandanus tandanus***.** *Native Fish Australia Technical Report* 1. Melbourne: Native Fish Australia (Victoria) Incorporated.

Trueman, WT (2007). *Some Recollections of Native Fish in the Murray-Darling System with Special Reference to the Trout Cod Maccullochella macquariensis.* Melbourne: Native Fish Australia (Victoria) Incorporated.

Trueman, WT. & Luker, C (1992). Fishing Yesteryear: The recollections of R. D. McKenzie. *Freshwater Fishing,* 17: pp. 34-38.

Tunbridge, BR (1977). A survey of the fish populations in the Mitta Mitta River and tributaries before the construction of Dartmouth Dam. In: *Dartmouth Dam Project: Report on Environmental Studies.* SRWSC

Valenciennes, A (1847). In*: Dictionnaire Universal D'Histoire Naturelle.* D'Orbigny, C. (Ed.) Paris: Renard, Martinet and Co.

Veevers, JJ (1984). *Phanaerozoic Earth History of Australia*. Oxford: Clarendon.

Victoria Government, (1867). *Report of the Royal Commission Appointed by His Excellency to Examine Into and Report Upon the Best Means of Clearing the River Murray.*

Victoria Government, (1907). *Annual Report of the Secretary for Mines Year 1907*. Melbourne: Government Printer.

Victoria Government, (1913). Report of the Sludge Abatement Board for 1913. In: *Annual Report of the Secretary for Mines Year 1913.* Melbourne: Government Printer.

Victoria Government, (1915). Report of the Sludge Abatement Board for 1915. In: *Annual Report of the Secretary for Mines Year 1915.* Melbourne: Government Printer.

Waite, ER (1923). *The Fishes of South Australia*. Adelaide: R.E.E. Rogers, Government Printer.

Walch, G (1880). *Victoria in 1880.* Melbourne: George Robertson

Wedlick, L (1974). *Sporting Fish of Inland Lakes and Streams.* Newport: Wedneil.

Wesson, S (2001). *Aboriginal flora and fauna names of Victoria: As extracted from early surveyors' reports*. Melbourne: Victorian Aboriginal Corporation for Languages.

Westergaard, S & Ye, Q (2010). *A captive spawning and rearing trial of river blackfish* (*Gadopsis marmoratus*): *efforts towards saving local genetic assets with recognised conservation significance from the South Australia Murray-Darling Basin*. Report to Department of Environment and Heritage. South Australia Research and Development Institute (Aquatic Sciences), Adelaide, 26pp. SARDI Publication Number F2010/000183-1. SARDI Research Report Series No. 471.

Westwood, JJ (1865). *The journal of J.J. Westwood (evangelist), or, An account of eight years' itineracy to the townships and squatting stations of Victoria, New South Wales, South Australia, and Tasmania.* Melbourne : Clarson, Shallard & Co.

Whitley, GP (1929). Studies in ichthyology. No. 3. *Records of the Australian Museum*, 17: pp. 101-43.

Whitley, GP (1937). Further ichthyological miscellanea. *Memoirs of the Queensland Museum,* 11 (2): pp. 125-131.

Whitley, GP (1955). The Largest (and the Smallest) Australasian Fishes. *Australian Museum Magazine,* 11: pp. 113-148.

Whittaker, DM (1963). *Wangaratta: Being the History of the Township that sprang up at Ovens Crossing and grew into a modern City*. Wangaratta City Council.

Whittington, RJ, Reddacliff, LA, Marsh, I, Kearns, C, Zupanovic, Z & Callinan, RB (1999). Further observations on the epidemiology and spread of epizootic haematopoietic necrosis virus (EHNV) in farmed rainbow trout *Oncorhynchus mykiss* in southeastern Australia and a recommended sampling strategy for surveillance. *Diseases of Aquatic Organisms*, 35: pp. 125-30.

Wilson, E (1857). On the Murray River Cod, with particulars of experiments instituted for introducing this fish into the River Yarra-Yarra. *Transactions of the Philosophical Institute of Victoria,* 2: pp. 23-34.

Wright, SW (1916). Extracts from diary published in the *Ovens Valley Register* 1916.

http://members.trump.net.au/ahvem/Family/Wright/The_Lure_of_Gold.html

Zeitz, AHC (1902). List of the edible fish of the lower Murray. *Transactions of the Royal Society of South Australia,* 26: pp. 265-267.

Zeitz, AHC (1908). A synopsis of the fishes of South Australia. *Transactions of the Royal Society of South Australia,* 32: pp. 288-299.

Zylstra, P (2003). *Fire History of the Australian Alps: Prehistory to 2003.* Australian Alps Liaison Committee, May 2006.

Index

A

Aboriginal fishing practices 24-6
- Central Murray River Catchment 15-5, 15-12, 15-15, 15-34
- Lodden River Catchment 16-4
- Lower Murray River Catchment 21-4
- Macquarie River Catchment 17-5, 17-6
- Murrumbidgee River Catchment 19-4
- Upper Murray River Catchment 10-4

Aboriginal management practices 24-12
Aboriginal meetings, preparation 24-10
Aboriginal names
- Blackfish 23-66
- Campaspe River Catchment 14-4
- Catfish 23-58
- Central Murray River Catchment 15-12, 15-15
- Golden perch 23-33
- Kiewa River Catchment 11-4
- Lodden River Catchment 16-4, 16-9
- Lower Murray River Catchment 21-9
- Macquarie perch 23-48
- Mitta Mittta River Catchment 9-4, 9-5, 9-19
- Murray cod 23-24
- Riverina River Catchment 20-4
- Silver perch 23-41
- Trout cod 23-5
- Upper Murray River Catchment 10-4

Abundance, description 7-1
Abundance, methodololgy 7-1
Acclimatisation 5-12
- Broken River Catchment 13-13
- Central Murray River Catchment 15-6
- Lodden River Catchment 16-5, 16-15
- Mitta Mittta River Catchment 9-18
- Murrumbidgee River Catchment 19-5, 19-23

Acclimatisation Society of Victoria 5-12, 8-5
Action Plan for South Australian Freshwater Fishes 21-6
Aitchison, Charlie 15-11, 15-14, 15-30
- Oral history 15-43

Allan, Lyn
- Broken River Trout Cod, photo ***13-10***
- Macquarie Perch at Redesdale, photo ***14-11***

Anderson, HK 5-20
- William Hill's cod catch, photo ***19-7***

Angling 5-14
- Blackfish 23-69
- Broken River Catchment 13-5, 13-12, 13-13
- Campaspe River Catchment 14-4, 14-5, 14-8, 14-12, 14-13, 14-14
- Catfish 23-61
- Central Murray River Catchment 15-6, 15-7, 15-30, 15-37
- Golden perch 23-36
- Goulburn River 8-9, 8-11
- Goulburn River Catchment 8-4, 8-5, 8-6, 8-8, 8-9, 8-11
- Goulburn Weir 8-5
- Lachlan River Catchment 18-8
- Lodden River Catchment 16-6, 16-8
- Macquarie perch 23-53
- Macquarie River Catchment 17-8
- Mathoura Trout cod, photo ***20-11***
- Mitta Mittta River Catchment 9-5, 9-6, 9-7, 9-8, 9-9, 9-18, 9-19
- Murray cod 23-29
- Murrumbidgee River Catchment 19-8, 19-9, 19-10, 19-12
- Ovens River Catchment 12-4, 12-5, 12-18
- Riverina River Catchment 20-4
- Seven Creeks 8-5, 8-6, 8-8
- Silver perch 23-44
- Sugarloaf Creek 8-8
- Trout cod 23-13
- Upper Murray River Catchment 10-5

Ashton, Eddie, A big cod shot, photo ***16-13***
Ashton, Mick
- A big cod shot, photo ***16-13***
- Lodden River Catchment 16-9, 16-14, 16-16
- Oral history 16-35
- Riverina River Catchment 20-7, 20-8, 20-14, 20-15

Assessment 7-4
Astell, Frank 17-10, 17-15
- Oral history 17-30

Auld, Bob 17-9
- Oral history 17-21

Avoca River Catchment Newspaper accounts 22-2

B

Bailey, Jim 19-11, 19-12, 19-22, 19-23
- Oral history 19-50

Bain, Ron 8-8, 8-9, 8-10, 8-25
- Oral history 8-48
- Trout cod on a pole, photo ***8-19***

Ballard, Denzil 19-11, 19-22
- Oral history 19-46

Bannister, Paul, Lake Sambell Trout cod, photo ***5-32***
Bannister, Thomas 18-4
Bartholomew, Andrew 5-13

An Artist's work, illus. ***5-19***
Becker, Ludwig 5-13
An Artist's work, illus. ***5-19***
Trout cod or Murray Cod, illus. ***5-18***
Trout or Murray Cod, illus. ***5-18***
Beer, Eric (Sugar) 18-13, 18-14
Oral history 18-28
Bell, Collin 8-8, 8-9, 8-10, 8-25, 8-28
Oral history 8-51
Bell, Ron 8-8, 8-9, 8-10, 8-12, 8-25, 8-28
Oral history 8-51
Bennett, George 5-7
Macquarie River Catchment 17-6
Murrumbidgee River Catchment 19-5, 19-11
Berner, Paul 13-13
A Huge Macquarie Perch, photo ***13-11***
Berra, Tim 5-30, 6-1, ***6-6***
Goulburn River Catchment 8-5
Lake Sambell Trout cod, photo ***5-32***, ***5-33***
Trout cod heads, photo ***6-6***
Betts, Hugh "Sony" 9-6, 9-17, 9-18, 9-19
Oral history 9-23
Beveridge, Peter 15-5, 16-5
Kow Swamp catch, photo ***15-25***
Bickford, Joy, Pental Island cod, photo ***15-27***
Biology of native fish 5-22, 5-30
Central Murray River Catchment 15-7, 15-37
A feature article on a mystical fish, illus ***5-26***
Murrumbidgee River Catchment 19-6
Trout cod 23-12
Blackfish 23-64
Aboriginal names 23-66
Angling 23-69
Broken River Catchment 13-5, 13-7, 13-12, 13-13, 13-14
Campaspe River Catchment 14-6, 14-8, 14-9, 14-12
Central Murray River Catchment 15-5, 15-12, 15-15, 15-16, 15-31, 15-32, 15-37
Community value 23-69
Current status 23-69
Decline 23-69
Distribution 23-67
European discovery 23-66
European names 23-66
The first Blackfish, photo ***23-66***
Goulburn River Catchment 8-7, 8-10, 8-12, 8-25, 8-28
Habitat 23-67
Kiewa River Catchment 11-4, 11-5, 11-9
Lachlan River Catchment 18-6, 18-7, 18-8, 18-13, 18-14
Lodden River Catchment 16-6, 16-8, 16-9, 16-14, 16-15
Lower Murray River Catchment 21-9, 21-18
Macquarie River Catchment 17-8, 17-9, 17-10, 17-15, 17-16
Mitta Mittta River Catchment 9-7, 9-8, 9-17, 9-19
Murrumbidgee River Catchment 19-9, 19-11, 19-13
Ovens River Catchment 12-4, 12-6, 12-7, 12-9, 12-18, 12-19, 12-21
Rarity scores 23-67
Regulation of fishing 23-70
Riverina River Catchment 20-6, 20-7, 20-8, 20-14, 20-17
Size 23-69
Translocations 23-68
Upper Murray River Catchment 10-6, 10-7, 10-20, 10-23
Blandowski, William 5-11
Blandowski's Trout cod, photo ***5-16***
Central Murray River Catchment 15-5, 15-14, 15-15, 15-16
Lodden River Catchment 16-9
Bluenose. *See* Trout cod
Blythman, Alfred, Mathoura Trout cod, photo ***20-11***
Bosley, Adam, Trout cod variations, photo ***6-5***
Boughyards. *See* Fish traps, native
Briggs, Don
Australian Aboriginal Fisheries 24-8, 24-13
Central Murray River Catchment 15-5, 15-13, 15-14, 15-31, 15-34
Oral history 15-48
Riverina River Catchment 20-7, 20-16
Yorta Yorta fish traps, photo ***15-9***
Brook, Bob 19-11
Oral history 19-46
Brown, Jack, Huge cod catch at Burrowye, photo ***10-19***
Brown trout, Suffield familly catches, photo ***12-16***
Brown trout, introduction
Broken River Catchment 13-13
Campaspe River Catchment 14-13
Central Murray River Catchment 15-35
Goulburn River Catchment 8-27, 8-28
Kiewa River Catchment 11-9
Lachlan River Catchment 18-14
Lodden River Catchment 16-16
Lower Murray River Catchment 21-20
Macquarie River Catchment 17-16
Mitta Mittta River Catchment 9-18

Murrumbidgee River Catchment 19-5, 19-23
Ovens River Catchment 12-19
Upper Murray River Catchment 10-21
Brutten, Bob 15-13
Bryan, John, Oral history 18-29
Bryan, Thomas, Prospect Hill Trout cod, photo ***8-22***
Bryant, Arthur, Homewood cod catch, photo ***8-23***
Buchan, Jim 17-15
The Forge, photo ***17-13***
Burnell, George 15-5
Burns, Rick
Lachlan River Catchment 18-13
Long Point cod, photo ***17-13***
Macquarie River Catchment 17-8, 17-9, 17-15, 17-16
Oral history 17-26
Burns, Wayne, Oral history 18-21
Burrow, Shirley 17-8, 17-15
Oral history 17-23
Burrowes, Don 12-6, 12-18, 12-19
Oral history 12-31
Suffield familly catches, photo ***12-16***
Burton, Oliver, Pental Island cod, photo ***15-27***
Bushfire, impact
Central Murray River Catchment 15-34
Goulburn River Catchment 8-26, 8-27, 8-29
Kiewa River Catchment 11-9
Lachlan River Catchment 18-13
Mitta Mittta River Catchment 9-18
Ovens River Catchment 12-6, 12-18, 12-19
Upper Murray River Catchment 10-21
Butcher, Alfred 5-30
Butcher, Frank, Mathoura Trout cod, photo ***20-11***
Butler, Ben, Big cod from the Mitta Mitta, photo ***9-16***
Butler, Ern, Big cod from the Mitta Mitta, photo ***9-16***
Byrom, Peter, Oral history 17-21

C

Cadwallader, Phillip 5-29
Cambell, Neil 18-7
Oral history 18-30
Campbell, Arch, Mitta Mitta Cod catch, photo ***9-15***
Campbell, Joe, Mitta Mitta Cod catch, photo ***9-15***
Carmody, Bert 12-6, 12-7, 12-8, 12-9, 12-18
Oral history 12-25
Carp, introduction
Billabong Creek Catfish, photo ***20-12***
Broken River Catchment 13-13
Campaspe River Catchment 14-13
Central Murray River Catchment 15-35
Goulburn River Catchment 8-29
Kiewa River Catchment 11-9
Lachlan River Catchment 18-14
Lodden River Catchment 16-16
Lower Murray River Catchment 21-18, 21-20, 21-21
Macquarie River Catchment 17-16
Mitta Mittta River Catchment 9-18
Murrumbidgee River Catchment 19-23
Ovens River Catchment 12-20
Riverina River Catchment 20-16
Upper Murray River Catchment 10-21
Castelnau, Francois, Comte de 5-12, 5-30
Castlenau's Trout Cod, photo. ***5-17***
Riverina River Catchment 20-7
Catfish 23-56
Aboriginal names 23-58
Angling 23-61
Broken River Catchment 13-5, 13-7, 13-12, 13-13, 13-14
Campaspe River Catchment 14-7, 14-8, 14-12
Central Murray River Catchment 15-4, 15-5, 15-11, 15-14, 15-15, 15-16, 15-30, 15-31, 15-32, 15-34, 15-35, 15-37
Commercial fishing 23-61
Community value 23-61
Current status 23-62
Decline 23-62
Distribution 23-59
European discovery 23-58
European names 23-59
Goulburn River Catchment 8-10, 8-12, 8-25, 8-26
Habitat 23-59
Kiewa River Catchment 11-5
Lachlan River Catchment 18-4, 18-5, 18-6, 18-7, 18-8, 18-13, 18-14
Lodden River Catchment 16-8, 16-9, 16-14, 16-18
Lower Murray River Catchment 21-6, 21-8, 21-9, 21-18, 21-21
Macquarie River Catchment 17-5, 17-8, 17-9, 17-10, 17-15, 17-16
Mitta Mittta River Catchment 9-9, 9-17
Murrumbidgee River Catchment 19-11, 19-12, 19-22, 19-23
Nesting 23-61
Ovens River Catchment 12-4, 12-7, 12-8, 12-9, 12-18
Rarity scores 23-59
Regulation of fishing 23-62
Riverina River Catchment 20-7, 20-14, 20-16, 20-17
Size 23-61

Translocations 23-60
Upper Murray River Catchment 10-8, 10-20
Catfish, photo
A big cod shot, photo ***16-13***
Billabong Creek Catfish, photo ***20-12***
Burrendong catch, photo ***17-14***
Cowra catch, photo ***18-12***
Early Barmah catch, photo ***15-22***
The first Catfish, photo ***23-58***
Fishing party near Morgan, photo ***21-15***
Morning's catch at Aleandria, photo ***8-20***
Chalmers, Harold 16-8, 16-9, 16-14, 16-15, 16-16
Oral history 16-24
Changes. *See also* Distribution and abundance changes; Habitat
Goulburn River Catchment 8-25
Kiewa River Catchment 11-9
Lachlan River Catchment 18-13
Lower Murray River Catchment 21-18
Macquarie River Catchment 17-15
Ovens River Catchment 12-18
Upper Murray River Catchment 10-20
Clarke, WB 9-5
Clifford, Laddie
Billabong Creek Catfish, photo ***20-12***
Broken River Catchment 13-6, 13-7, 13-12
Campaspe River Catchment 14-8
Central Murray River Catchment 15-13, 15-14, 15-15, 15-30, 15-31
A Huge Macquarie Perch, photo ***13-11***
Laddie's catch, photo ***20-13***
Murrumbidgee River Catchment 19-12
Ovens River Catchment 12-5
Riverina River Catchment 20-5, 20-6, 20-7, 20-8, 20-14, 20-16
Silver perch at Yarrawonga, photo ***15-20***
Clifford, Max
Central Murray River Catchment 15-13, 15-14, 15-15, 15-31
Golden perch at Barmah, photo ***15-23***
Oral history 15-50
Riverina River Catchment 20-14
Clifford, Ramon
Billabong Creek Catfish, photo ***20-12***
Golden perch at Barmah, photo ***15-23***
Laddie's catch, photo ***20-13***
Murray cod and Trout cod compared, photo ***6-4***
Trout cod heads, photo ***6-6***
Cockburn, Rod 19-11, 19-22
Oral history 19-49
Cole, Brendan 17-15
Oral history 17-23
Cole, Edward 15-5
Cole, Tim, Trout cod at Tongalong, photo ***15-21***
Coloration 6-1
Colvin, John 14-7, 14-8, 14-12
Oral history 14-18
Commercial fishing
Catfish 23-61
Central Murray River Catchment 15-5, 15-7, 15-11, 15-31, 15-32, 15-33
Golden perch 23-36
Lachlan River Catchment 18-5
A large catch at Renmark, photo ***21-13***
A large Golden perch, photo ***21-14***
Lodden River Catchment 16-5
Lower Murray River Catchment 21-4, 21-5, 21-6, 21-9, 21-18, 21-19
Macquarie perch 23-53
Macquarie River Catchment 17-9
Murray cod 23-28
Murrumbidgee River Catchment 19-5, 19-10, 19-11
Riverina River Catchment 20-4, 20-5
Silver perch 23-44
Trout cod 23-13, 23-15
Upper Murray River Catchment 10-7
William Hill's cod catch, photo ***19-7***
Community value
Blackfish 23-69
Catfish 23-61
Golden perch 23-36
Macquarie perch 23-53
Murray cod 23-28
Silver perch 23-44
Trout cod 23-13
Cook, Frank 13-5, 13-6
Cooper, John, Big Trout cod in the past, photo ***23-18***
Copper Sulphate, impact
Lower Murray River Catchment 21-20
Upper Murray River Catchment 10-21
Coulson, Helen, Early Barmah catch, photo ***15-22***
Craven, Grove
Lachlan River Catchment 18-7, 18-8
Murrumbidgee River Catchment 19-10, 19-22
Oral history 18-30
Croker, Les 18-6, 18-7, 18-13
Oral history 18-19
Cubbin, Wally, McLeod's livelihood, photo ***8-24***
Cumming, Lindsay
Slopes habitat in the Goulburn, photo ***8-18***

Trout cod on a pole, photo ***8-19***
Curr, Edward 15-4
Current situation 5-31
Broken River Catchment 13-14
Campaspe River Catchment 14-14
Central Murray River Catchment 15-37
Goulburn River Catchment 8-29
Kiewa River Catchment 11-9
Lachlan River Catchment 18-14
Lodden River Catchment 16-18
Lower Murray River Catchment 21-21
Macquarie River Catchment 17-15
Mitta Mittta River Catchment 9-19
Murrumbidgee River Catchment 19-24
Ovens River Catchment 12-21
Riverina River Catchment 20-17
Upper Murray River Catchment 10-23
Current status
Blackfish 23-69
Catfish 23-62
Golden perch 23-37
Macquarie perch 23-53
Murray cod 23-29
Silver perch 23-44
Trout cod 23-15
Cussack, Tom 18-7, 18-8
Oral history 18-31
Cuvier, Georges 5-5, 5-6, 5-7, 5-8, 5-14, 5-30, 17-8
Cuvier's Macquarie perch, photo ***17-6***
Descriptions 5-30
The first Macquarie perch, photo ***23-48***
Macquarie River Catchment 17-4, 17-5
Trout Cod, photo. ***5-9***

D

Dakin, William 5-28
Murrumbidgee River Catchment 19-6
William Hill's cod catch, photo ***19-7***
Dalmenico, Ron 16-8, 16-14
Oral history 16-22
Dam construction, impact. *See* Weir and Dam construction, impact
Dannevig Harald 5-20
Australian Aboriginal Fisheries 24-13
Lower Murray River Catchment 21-5
Murrumbidgee River Catchment 19-6
Davies, Henry
Campaspe River Catchment 14-8
Central Murray River Catchment 15-12, 15-13, 15-14, 15-15, 15-16, 15-32, 15-35
Kow Swamp catch, photo ***15-25***
Murrumbidgee River Catchment 19-22
Oral history 15-54
Trout cod and Murray cod near Swan Hill, photo ***15-28***
Davies, William 5-30, 15-13
Kow Swamp catch, photo ***15-25***
Trout cod and Murray cod near Swan Hill, photo ***15-28***
Davis, Jennifer 8-43
Daws, Gary
Central Murray River Catchment 15-13, 15-14, 15-31
Oral history 12-27
Ovens River Catchment 12-6, 12-7, 12-8, 12-18, 12-19
Dawson, Henry 5-20
Deal, Ray, Eildon Macquarie perch, photo ***8-17***
Denson, Noel 19-11, 19-12, 19-13, 19-22, 19-23
Oral history 19-52
Dept. of Fisheries, NSW. *See* Fisheries NSW
Descriptions 5-29, 6-1, 6-2, 6-3
Early 5-4, 5-5, 5-6, 5-7, 5-10, 5-12, 5-13, 5-14
Murray cod and Trout cod compared, photo ***6-4***
Newspaper 5-15, 5-22, 5-23
Trout cod 5-28, 5-29, 23-5
De-snagging. *See* Snagging, impact
Dick, Hugh 15-12, 15-14
Oral history 15-47
Differences between Murray cod and Trout cod 6-1
Discovery. *See* also, European discovery
Discovery of gold. *See* Gold, Discovery
Disease, impact
Broken River Catchment 13-13
Central Murray River Catchment 15-34, 15-35
Goulburn River Catchment 8-27
Lower Murray River Catchment 21-20
Murrumbidgee River Catchment 19-23, 19-24
Ovens River Catchment 12-20
Distribution
Broken River Catchment 13-4
Campaspe River Catchment 14-6
Central Murray River Catchment 15-10
Goulburn River Catchment 8-6
Kiewa River Catchment 11-4
Lachlan River Catchment 18-5
Lodden River Catchment 16-5
Lower Murray River Catchment 21-6
Macquarie River Catchment 17-7
Mitta Mittta River Catchment 9-6

Murrumbidgee River Catchment 19-8, 19-22
Ovens River Catchment 12-5
Riverina River Catchment 20-5
Upper Murray River Catchment 10-5
Distribution and abundance changes
Broken River Catchment 13-12
Campaspe River Catchment 14-12
Central Murray River Catchment 15-30
Goulburn River Catchment 8-25
Kiewa River Catchment 11-9
Lachlan River Catchment 18-13, 21-18
Lodden River Catchment 16-14
Lower Murray River Catchment 21-18
Macquarie River Catchment 17-15
Mitta Mittta River Catchment 9-17
Murrumbidgee River Catchment 19-22
Ovens River Catchment 12-18
Riverina River Catchment 20-14
Upper Murray River Catchment 10-20
Distribution and Habitat
Blackfish 23-67
Catfish 23-59
Golden perch 23-34
Macquarie perch 23-49
Murray cod 23-25
Silver perch 23-42
Trout cod 23-7
Domenico, Jack, Mathoura Cod catch, photo ***20-10***
Doxey, Ambrose 13-5, 13-6, 13-7, 13-12, 13-13
Oral history 13-16
Dracatos, George, Laddie's catch, photo ***20-13***
Dracatos, John, Laddie's catch, photo ***20-13***
Dredging, impact
Broken River Catchment 13-13
Kiewa River Catchment 11-9
Lodden River Catchment 16-15
Mitta Mittta River Catchment 9-18
Ovens River Catchment 12-19
Drought, impact
Broken River Catchment 13-12, 13-13, 13-14
Campaspe River Catchment 14-14
Central Murray River Catchment 15-34
Lachlan River Catchment 18-13
Lodden River Catchment 16-15
Lower Murray River Catchment 21-6, 21-18
Macquarie River Catchment 17-16
Murray River drought, photo ***15-26***
Murrumbidgee River Catchment 19-5
Riverina River Catchment 20-15, 20-17
Upper Murray River Catchment 10-20
Dunkley, Greg 12-9, 12-18
Dyer, Max 9-4, 9-6, 9-7, 9-8, 9-17, 10-6
Oral history 9-23

E

East, George 14-6, 14-7
Oral history 14-18
Egan, 'Tiny' 19-9, 19-22
Oral history 19-40
Eildon Dam, impact 8-25, 8-27
Eildon Weir 8-25, 8-26, 8-27
Ellis, Bill 15-30, 15-31
Ellis, Gladys 12-8, 12-9, 12-18
Elvins, Dick 18-6, 18-7, 18-13, 18-14
Oral history 18-24
English roach, introduction, Goulburn River Catchment 8-28
European carp. *See* Carp, introduction
European discovery 5-4
Blackfish 23-66
Broken River Catchment 13-4
Campaspe River Catchment 14-4
Catfish 23-58
Central Murray River Catchment 15-4
Golden perch 23-33
Goulburn River Catchment 8-4
Kiewa River Catchment 11-4
Lachlan River Catchment 18-4
Lodden River Catchment 16-4
Lower Murray River Catchment 21-4
Macquarie perch 23-48
Macquarie River Catchment 17-4
Mitta Mittta River Catchment 9-4
Murray cod 23-24
Murrumbidgee River Catchment 19-4
Ovens River Catchment 12-4
Riverina River Catchment 20-4
Silver perch 23-41
Trout cod 23-5
Upper Murray River Catchment 10-4
European names 5-12, 5-14, 5-21
Blackfish 23-66
Catfish 23-59
Golden perch 23-34
Macquarie perch 23-49
Murray cod 23-25
Silver perch 23-42
Trout cod 23-5
Evans, David 9-9, 9-17
Oral history 9-29

Evans, George 5-4, 5-20
Lachlan River Catchment 18-4
Macquarie River Catchment 17-4
Trout cod 23-5
Evidence 7-2
Expeditions
Blandowski, William, 1857 5-11
French 5-4
Garnot & Lesson, 1824 5-5
Mithcell, 1831 5-7
Ross, James, 1839 5-10
External features of Murray cod and Trout cod 6-3, ***6-4***

F

Features of Murray cod and Trout cod ***6-5***
Finch, Yvonne, Homewood cod catch, photo ***8-23***
Finlayson, Brian 8-43
Fire. *See* Bushire, impact
Fish, catch
Broken River Catchment 13-6
Campaspe River Catchment 14-6, 14-8
Central Murray River Catchment 15-4, 15-5, 15-6, 15-7, 15-11, 15-12, 15-14, 15-15, 15-16, 15-31, 15-32, 15-33
Goulburn River Catchment 8-5, 8-8, 8-9, 8-11, 8-12
Kiewa River Catchment 11-4, 11-5
Lachlan River Catchment 18-4, 18-5, 18-6
Lodden River Catchment 16-5, 16-6, 16-7, 16-8, 16-9, 16-16
Lower Murray River Catchment 21-6, 21-8, 21-9
Macquarie River Catchment 17-4, 17-5, 17-6, 17-8, 17-9, 17-10
Mitta Mittta River Catchment 9-6, 9-7, 9-8
Murrumbidgee River Catchment 19-4, 19-5, 19-8, 19-9, 19-10, 19-11
Ovens River Catchment 12-4, 12-9, 12-20
Riverina River Catchment 20-4, 20-6, 20-7
Upper Murray River Catchment 10-4, 10-7, 10-8
Fish, decline
Central Murray River Catchment 15-31, 15-32, 15-33, 15-35, 15-37
Goulburn River Catchment 8-25, 8-26, 8-27, 8-28
Lachlan River Catchment 18-13, 18-14
Lodden River Catchment 16-14, 16-15, 16-16
Lower Murray River Catchment 21-18, 21-19, 21-20, 21-21
Macquarie perch 23-53
Macquarie River Catchment 17-15, 17-16
Mitta Mittta River Catchment 9-17, 9-18
Murray cod 23-29
Murrumbidgee River Catchment 19-6, 19-12, 19-13
Riverina River Catchment 20-14
Silver perch 23-44
Fish abundance, description 7-1
Fish decline. *See also* Changes; Lowland zone, Changes; Montane zone, Changes; Upland zone, Changes
Blackfish 23-69
Central Murray River Catchment 15-30
Golden perch 23-37
Murrumbidgee River Catchment 19-22, 19-23, 19-24
Riverina River Catchment 20-15
Trout cod 23-15
Fish distribution see, Distribution
Fish names. *See also* Aboriginal names
aboriginal 2-1
common 2-1
scientific 2-1
Fish traps, native 24-6
Australian Aboriginal Fisheries 24-7
Central Murray River Catchment 15-5
Murrumbidgee River Catchment 19-4
Upper Murray River Catchment 10-7
Yorta Yorta fish traps, photo ***15-9***
Fisheries and Game Dept, Victoria 5-29, 5-30
Ovens River Catchment 12-20
Fisheries NSW 5-14, 5-20, 5-29
Annual Report extracts 10-24, 15-41, 17-19, 18-16, 19-30, 20-21
Central Murray River Catchment 15-7, 15-10, 15-41
Fisheries Research Station, Narrandera 5-30
Fisheries South Australia 5-20
Fishways
Broken River Catchment 13-14
Central Murray River Catchment 15-34
The Forge, photo ***17-13***
Lachlan River Catchment 18-14
Lodden River Catchment 16-16
Lower Murray River Catchment 21-19
Macquarie River Catchment 17-9, ***17-13***
Murrumbidgee River Catchment 19-9
Ovens River Catchment 12-19, 12-21
Riverina River Catchment 20-15
Fitzroy, Dorothy (Hill), Morning's catch at Aleandria, photo ***8-20***
Flint, Arthur (Tibby) 18-6, 18-7, 18-13, 18-14
Cowra catch, photo ***18-12***
Lachlan River Trout cod, photo ***18-11***

Oral history 18-28
Flooding, impact
Broken River Catchment 13-7, 13-13
Campaspe River Catchment 14-8, 14-9, 14-12, 14-13
Central Murray River Catchment 15-31, 15-34
Goulburn River Catchment 8-25, 8-26, 8-27
Kiewa River Catchment 11-9
Lachlan River Catchment 18-5
Lodden River Catchment 16-15
Lower Murray River Catchment 21-7, 21-8
Macquarie River Catchment 17-16
Mitta Mittta River Catchment 9-18
Murrumbidgee River Catchment 19-6, 19-8
Upper Murray River Catchment 10-7
Forsythe, Robert (jnr), An Upland catch, photo ***8-16***
Foster, Ralph 21-8
Franks, Jack, Big cod from the Mitta Mitta, photo ***9-16***
Franks, Les "Brickie" 9-7, 9-8, 9-9, 9-17, 9-18, 9-19
Big cod from the Mitta Mitta, photo ***9-16***
Oral history 9-28
French, George 21-4

G

Gale, John 19-5
Garing, George, Boort cod catch, photo ***16-12***
Garing, Nell, Indi River catch, photo ***10-13***
Garlick, Digger 8-10, 8-25
Oral history 8-49
Garnot, Prosper 5-4
George, Hector, Morning's catch at Aleandria, photo ***8-20***
Gilmore, Mary
Australian Aboriginal Fisheries 24-6, 24-7, 24-8, 24-10, 24-12
Murrumbidgee River Catchment 19-4
Gold, Discovery
Campaspe River Catchment 14-4
Goulburn River Catchment 8-4, 8-26
Kiewa River Catchment 11-9
Lachlan River Catchment 18-5
Lodden River Catchment 16-4, 16-5, 16-15
Macquarie River Catchment 17-6
Mitta Mittta River Catchment 9-5, 9-18
Ovens River Catchment 12-4, 12-18
A ruined river, photo ***16-17***
Upper Murray River Catchment 10-4, 10-20
Gold rush. *See* Gold, Discovery
Golden perch 23-31
Aboriginal names 23-33
Angling 23-36
Broken River Catchment 13-7, 13-12, 13-13, 13-14
Campaspe River Catchment 14-7, 14-8, 14-12, 14-14
Central Murray River Catchment 15-5, 15-11, 15-14, 15-16, 15-30, 15-31, 15-32, 15-34, 15-37
Commercial fishing 23-36
Community value 23-36
Current status 23-37
Decline 23-37
Distribution 23-34
European discovery 23-33
European names 23-34
Goulburn River Catchment 8-9, 8-11, 8-25, 8-26
Habitat 23-34
Kiewa River Catchment 11-9
Lachlan River Catchment 18-5, 18-7, 18-8, 18-14
Lodden River Catchment 16-8, 16-9, 16-14, 16-18
Lower Murray River Catchment 21-5, 21-6, 21-8, 21-18, 21-19, 21-20
Macquarie River Catchment ***17-7***, 17-8, 17-10, 17-15, 17-16
Mitta Mittta River Catchment 9-9, 9-17
Murrumbidgee River Catchment 19-5, 19-6, 19-10, 19-11, 19-12, 19-22, 19-23, 19-25
Ovens River Catchment 12-8, 12-9, 12-18, 12-21
Propogation 23-36
Rarity scores 23-35
Riverina River Catchment 20-7, 20-14, 20-17
Size 23-36
Translocations 8-6, 8-11, 23-36
Upper Murray River Catchment 10-8, 10-20, 10-23
Golden perch, photo
Burrendong catch, photo ***17-14***
Cowra catch, photo ***18-12***
Early Barmah catch, photo ***15-22***
The first Golden perch, photo ***23-33***
Fishing party near Morgan, photo ***21-15***
Golden perch at Barmah, photo ***15-23***
Gunther's Golden perch, photo ***17-7***
Hill family catches, photo ***19-20***
Kow Swamp catch, photo ***15-25***
A large Golden perch, photo ***21-14***
Goldfish, introduction
Campaspe River Catchment 14-13
Central Murray River Catchment 15-30, 15-35
Goulburn River Catchment 8-28
Kiewa River Catchment 11-9
Lodden River Catchment 16-16
Lower Murray River Catchment 21-20

Macquarie River Catchment 17-16
Mitta Mittta River Catchment 9-18
Murrumbidgee River Catchment 19-5, 19-23
Riverina River Catchment 20-15
Upper Murray River Catchment 10-21
Goulburn Weir 8-26
Grant, Roy
Burrowye cod catch, photo ***10-18***
Central Murray River Catchment 15-11
Huge cod catch at Burrowye, photo ***10-19***
Oral history 10-28
Trout cod and Silver Perch at Burrowye, photo ***10-17***
Upper Murray River Catchment 10-7, 10-8, 10-20, 10-21
Grant, Stan, Trout cod and Silver Perch at Burrowye, photo ***10-17***
Grattidge, Walter
Goulburn River Catchment 8-8
Kiewa River Catchment 11-5, 11-9
Oral history 12-24
Ovens River Catchment 12-7, 12-8, 12-18
Upper Murray River Catchment 10-8
Greasy. *See* Blackfish
Grunter. *See* Silver perch
Gunther, Albert 5-10, 5-14, 5-21
Gunther's Drawing of a Trout cod, photo ***5-17***
Gunther's drawing of a Trout cod, photo ***5-17***
Gunther's Golden perch, photo ***17-7***

H

Habitat ***7-6***
A big cod shot, photo ***16-13***
Big river, photo ***9-13***
Broken River Catchment 13-14
Central Murray Beach, photo ***15-8***
Central Murray River Catchment 15-5, 15-32
Colonisation 5-4
Description 7-2
Early 5-3
Early Barmah catch, photo ***15-22***
The Forge, photo ***17-13***
Gigerline Gorge Murray cod, photo ***19-17***
Goulburn River Catchment, photo. ***7-6***, ***8-18***
Habitat types of the Murray-Darling River Basin, photo ***7-6***
Kiewa River Catchment 11-4, 11-9
Lower Murray River Catchment 21-7
Mitta Mittta River Catchment ***9***-***13***, 9-18
Murray River drought, photo ***15-26***
Pental Island cod, photo ***15-27***
A ruined river, photo ***16-17***
The Seven Creeks: a last upland refuge, photo ***23-20***
Towong cod, photo ***10-14***
Upper Campaspe River, photo ***14-5***
Upper Murray Habitat, photo ***10-12***
Upper Murray River Catchment 10-5
William Hill's cod catch, photo ***19-7***
Habitat, Changes
Broken River Catchment 13-13
Campaspe River Catchment 14-12, 14-13
Central Murray River Catchment 15-32
Goulburn River Catchment 8-26
Kiewa River Catchment 11-9
Lachlan River Catchment 18-13
Lodden River Catchment 16-15
Lower Murray River Catchment 21-18
Macquarie River Catchment 17-15
Mitta Mittta River Catchment 9-18
Murrumbidgee River Catchment 19-23
Ovens River Catchment 12-18
Riverina River Catchment 20-14, 20-16
Upper Murray River Catchment 10-20
Hadley, John, Oral history 17-23
Hadley, Neville 11-5
Hain, Gordon 19-8
Murrumbidgee River Catchment 19-22
Oral history 19-40
Hamilton, George 21-4
Hammer, Michael 21-8
Lower Murray Macquarie perch, photo ***21-17***
Purnong Trout cod, photo ***21-16***
They call the Trout cod the Rock cod, photo ***21-16***
Handorf, Claude
Central Murray River Catchment 15-11, 15-30, 15-31
Howlong cod catch, photo ***15-19***
Oral history 15-43
Riverina River Catchment 20-5, 20-6, 20-7, 20-14, 20-16
Hanley, Jim 8-11, 8-12, 8-25, 8-26
Oral history 8-52
Hanrahan, Peter
Lachlan River Catchment 18-6, 18-7, 18-13
Macquarie River Catchment 17-8
Oral history 18-20
Hardie, Mac 19-4, 19-12, 19-22
Central Murrumbidgee River Stone Fishery, photo ***24-11***

Murrumbidgee River Catchment 19-22
Oral history 19-51
Harrison, Rod 18-6, 18-13, 18-14
Lachlan River Trout cod, photo ***18-11***
Last Upper Murray Trout cod, photo ***10-22***
Haskins, Jeff 17-8, 17-15
Oral history 17-22
Hawdon, Joseph 8-4
Henderson, Keith
Broken River Catchment 13-6
Broken River Trout Cod, photo ***13-10***
Campaspe River Catchment 14-4, 14-5, 14-7, 14-12
Macquarie Perch at Redesdale, photo ***14-11***
Hill, Edward (Ted), Hill family catches, photo ***19-20***
Hill, Harry, Oral history 19-47
Hill, William 19-6, 19-10, 19-11, 19-22
Bringagee catch, photo ***19-21***
Hill family catches, photo ***19-20***
Oral history 19-36
William Hill's cod catch, photo ***19-7***
Hobbes Scott, Thomas 17-4
Cuvier's Macquarie perch, photo ***17-6***
Hollands, Bill 9-7, 9-8, 9-17
Oral history 9-23
Holmes, Ross, Kambah catch, photo ***19-18***
Holt, Allan 12-6, 12-9
Oral history 12-30
Trout cod from Lake Sambell, photo ***12-15***
Holt, Geoff 12-6, 12-8, 12-9, 12-20
Oral history 12-29
Holt, Roy, Trout cod from Lake Sambell, photo ***12-15***
Hopkins, Ray 8-9, 8-10
Homewood cod catch, photo ***8-23***
Oral history 8-49
Hovell, William
Broken River Catchment 13-4
Goulburn River Catchment 8-4
Kiewa River Catchment 11-4
Murrumbidgee River Catchment 19-4
Ovens River Catchment 12-4
Upper Murray River Catchment 10-4
Howarth, Fred, The Forge, photo ***17-13***
Howe, Clarrie 12-5
Howitt, William 14-4
Huddle, Max, Mathoura Trout cod, photo ***20-11***
Hume, Hamilton
Broken River Catchment 13-4
Goulburn River Catchment 8-4
Kiewa River Catchment 11-4
Ovens River Catchment 12-4
Upper Murray River Catchment 10-4
Hume Dam 9-19, 10-22

I

Inland Fisheries Research Station 19-6
Inward, Bill 17-8, 17-9, 17-10, 17-15, 17-16
Oral history 17-27

J

Jarman, JH 5-23
Lachlan River Catchment 18-7
Murrumbidgee River Catchment 19-6
Jarvis, Ivan, Tintaldra cod catch, photo ***10-16***
Jarvis, Joe, Tintaldra Trout cod, photo ***10-15***
Jarvis, Tom 10-7, 10-8, 10-20, 10-21
Oral history 10-30
Tintaldra cod catch, photo ***10-16***
Tintaldra Trout cod, photo ***10-15***
Jenkins, Charles, Oligorous gibbiceps, photo ***5-19***
Jervis, Lance
Oral history 12-30
Ovens River Catchment 12-20
John Lake Centre 19-6
Johnson, Olly, Eildon Macquarie perch, photo ***8-17***
Jones, Ernie 15-13
Oral history 15-46
Jones, George 13-6, 13-7, 13-12, 13-13
Oral history 13-17
Jones, Keith 8-8, 8-10, 8-12, 8-26
Oral history 8-52
Jones, Ken 17-10, 17-15
Oral history 17-31
Jones, Lee, Mathoura Trout cod, photo ***20-11***
Jude, Florence, Trout cod and Murray cod near Swan Hill, photo ***15-28***
Jude, Peggy, Trout cod and Murray cod near Swan Hill, photo ***15-28***

K

Kerr, Peter 8-8, 8-9, 8-25, 8-26, 8-27
Oral history 8-47
Kesteven, Geoffrey 5-28
Murrumbidgee River Catchment 19-6
William Hill's cod catch, photo ***19-7***
Kneebone, Bing 12-7, 12-8, 12-18, 12-19
Oral history 12-29
Knox, Tom 12-8, 12-9, 12-19
Oral history 12-31
Kraus, Joe
Oral history 12-30

Ovens River Catchment 12-20
Kuefer, Johann. *See* Cuvier, Georges

L
Lake, John 5-29, 15-11
Central Murray River Catchment 15-7
Descriptions 5-30
Tintaldra Trout cod, photo ***10-15***
Lake Eildon, impact 8-25
Lake Sambell 12-5, 12-20
Land clearing, impact
Broken River Catchment 13-13
Campaspe River Catchment 14-12
Central Murray River Catchment 15-34, 15-35
Goulburn River Catchment 8-26
Macquarie River Catchment 17-15
Mitta Mittta River Catchment 9-18
Ovens River Catchment 12-18
Riverina River Catchment 20-14
A ruined river, photo ***16-17***
Laney, Harry 19-11, 19-12, 19-13, 19-22, 19-24
Oral history 19-48
Langtry, John 5-29, 5-30
Broken River Catchment 13-4
Central Murray River Catchment 15-7, 15-11, 15-13, 15-14, 15-16, 15-30, 15-31, 15-32, 15-35
Goulburn River Catchment 8-5, 8-9
Lachlan River Catchment 18-5, 18-7, 18-14
Lodden River Catchment 16-5, 16-9, 16-16
Lower Murray River Catchment 21-6, 21-8
Murrumbidgee River Catchment 19-6, 19-12, 19-23
Ovens River Catchment 12-5, 12-8, 12-18, 12-19
Riverina River Catchment 20-5
Upper Murray River Catchment 10-5
Laporte, Francois. *See* Castelnau, Francois, Comte de
Lebner, Len 10-6, 10-7, 10-8, 10-20, 10-21
Boort cod catch, photo ***16-12***
Indi River catch, photo ***10-13***
Oral history 10-31
Towong cod, photo ***10-14***
Upper Murray Habitat, photo ***10-12***
Lee, Bruce 17-9, 17-10, 17-15
Burrendong catch, photo ***17-14***
Macquarie River Catchment 17-16
Oral history 17-29
Legislation
Blackfish 23-70
Catfish 23-62
Golden perch 23-37
Macquarie perch 23-54
Murray cod 23-29
Silver perch 23-44
Trout cod 23-15
Lesson, Renee 5-4, 5-5, 5-6, 5-7, 6-2
Cuvier's Macquarie perch, photo ***17-6***
The first Macquarie perch, photo ***23-48***
First Trout Cod, photo. ***5-9***
Macquarie River Catchment 17-4, 17-5, 17-8
Trout cod 23-5
Lethbridge, HO 5-20
Lever, Bill
Central Murray River Catchment 15-14, 15-31, 15-32
Lower Murray River Catchment 21-18, 21-21
Oral history 15-56
Lewis, Joe 18-6, 18-7, 18-13, 18-14
Lachlan River Trout cod, photo ***18-11***
Oral history 18-22
Lhotsky, Johann
Lachlan River Catchment 18-4, 18-6
Mitta Mittta River Catchment 9-4
Murrumbidgee River Catchment 19-5
Lintermans, Mark, Murrumbidgee River Catchment 19-9, 19-22
Living Murray Initiative 15-37
Longford, Marge
Bringagee catch, photo ***19-21***
Hill family catches, photo ***19-20***
Oral history 19-52
William Hill's cod catch, photo ***19-7***
Lowland zone
Broken River Catchment 13-6, 13-12, 13-14
Campaspe River Catchment 14-8
Central Murray River Catchment 15-10, 15-12, 15-15
Goulburn River Catchment 8-10, 8-11
Habitat types of the Murray-Darling River Basin, photo ***7-6***
Lachlan River Catchment 18-7
Lodden River Catchment 16-8
Macquarie River Catchment 17-10
Murrumbidgee River Catchment 19-11, 19-12
Ovens River Catchment 12-8, 12-21
Riverina River Catchment 20-6, 20-7
William Hill's cod catch, photo ***19-7***
Lowland zone, Changes
Broken River Catchment 13-12
Central Murray River Catchment 15-30, 15-31, 15-32
Goulburn River Catchment 8-25

Lachlan River Catchment 18-13
Lodden River Catchment 16-14
Macquarie River Catchment 17-15
Murrumbidgee River Catchment 19-22
Ovens River Catchment 12-18, 12-19
Riverina River Catchment 20-14
Luker, Collin 8-6
Trout cod variations, photo ***6-5***
Lyons, Jarod 12-8

M

Macdonald, Donald 5-22
Macquarie perch 23-46
Aboriginal names 23-48
Angling 23-53
Broken River Catchment 13-4, 13-5, 13-6, 13-7, 13-12, 13-13, 13-14
Campaspe River Catchment 14-4, 14-7, 14-8, 14-12, 14-13, 14-14
Central Murray River Catchment 15-11, 15-13, 15-14, 15-16, 15-30, 15-31, 15-32, 15-34, 15-37
Commercial fishing 23-53
Community value 23-53
Current status 23-53
Decline 23-53
Distribution 23-49
European discovery 23-48
European names 23-49
Goulburn River Catchment 8-7, 8-11, 8-25, 8-26
Habitat 23-49
Kiewa River Catchment 11-5
Lachlan River Catchment 18-6, 18-7, 18-8, 18-13, 18-14
Lodden River Catchment 16-6, 16-7, 16-8, 16-9, 16-14
Lower Murray River Catchment 21-8, 21-18, 21-19
Macquarie River Catchment 17-4, 17-8, 17-9, 17-10, 17-15
Migrations 23-52
Mitta Mittta River Catchment 9-6, 9-7, 9-8, 9-17, 9-19
Murrumbidgee River Catchment 19-6, 19-9, 19-10, 19-11, 19-12, 19-22, 19-23, 19-24
Ovens River Catchment 12-5, 12-6, 12-7, 12-9, 12-18, 12-20
Propogation 15-7
Rarity scores 23-50
Riverina River Catchment 20-5, 20-6, 20-7, 20-14
Size 23-52
Translocations 8-5, 8-6, 8-11, 8-25, 8-26, 8-29, 23-51
Upper Murray River Catchment 10-6, 10-7, 10-8, 10-20, 10-23
Macquarie perch, photo
Cuvier's Macquarie perch, photo ***17-6***
Eildon Macquarie perch, photo ***8-17***
Eurobin catches, photo ***12-13***
The first Macquarie perch, photo ***23-48***
A Huge Macquarie Perch, photo ***13-11***
Indi River catch, photo ***10-13***
Kambah catch, photo ***19-18***
Lower Murray Macquarie perch, photo ***21-17***
Macquarie Perch at Redesdale, photo ***14-11***
Morning's catch at Aleandria, photo ***8-20***
An Upland catch, photo ***8-16***
Maher, Ken 17-8, 17-15, 17-16
Oral history 17-21
Major, Ken 14-8, 14-12, 14-13
Oral history 14-19
Mannik, Iris, Ovens River Catchment 12-20
Maples, Len 12-8
Oral history 12-33
Markings 6-1, 6-2
Marrett, FJ, Kow Swamp catch, photo ***15-25***
Masters, Jim
Eurobin catches, photo ***12-13***
Silver perch at Yarrawonga, photo ***15-20***
Mathews, Max 8-7, 8-9, 8-28
Oral history 8-35
An Upland catch, photo 8-15
Mathews, RH
Brewarrina Stone Fisheries, figure ***24-9***
Brewarrina Stone Fisheries, photo ***24-9***
McAllister, Peter 18-6, 18-13, 18-14
Oral history 18-18
McCoy, Frederick 5-13
An Artist's work, illus. ***5-19***
Trout cod or Murray Cod, illus. ***5-18***
Trout or Murray Cod, illus. ***5-18***
McDonald, Ian
Central Murray River Catchment 15-13, 15-14, 15-15, 15-31, 15-32
Lodden River Catchment 16-7, 16-8, 16-9
Murray River drought, photo ***15-26***
Oral history 15-52, 16-22
McFarlane, Alf and Erskine "Rusty"
Central Murray River Catchment 15-11, 15-30, 15-35, 15-36
Kiewa River Catchment 11-5
Oral history 10-26, 11-11

Upper Murray River Catchment 10-5, 10-7, 10-8, 10-20, 10-21, 10-22
McGinnity, Jim 10-7, 10-8
Oral history 10-31
McIntosh, Samuel 5-20
Lower Murray River Catchment 21-9
McKenzie, Greg & Wendy, Big Trout cod in the past, photo ***23-18***
McKenzie, Heath, A giant Trout cod today, photo ***23-19***
McKenzie, RD (Bert) 10-20
Campaspe River Catchment 14-7
Central Murray River Catchment 15-13
Goulburn River Catchment 8-6, 8-7, 8-8, 8-9, 8-10, 8-11, 8-12, 8-25, 8-26, 8-27, 8-29
Oral history 8-39, 8-43, 10-28, 12-24, 15-45, 20-24
Ovens River Catchment 12-6
Riverina River Catchment 20-7
Slopes habitat in the Goulburn, photo ***8-18***
Trout cod on a pole, photo ***8-19***
Two trout at Moleworth, photo ***8-21***
Upper Murray River Catchment 10-7
McLaurin, James 20-4
McLeod, Andrew, McLeod's livelihood, photo ***8-24***
McLeod, Graeme 8-10, 8-11, 8-12, 8-25, 8-26, 8-28
McLeod's livelihood, photo ***8-24***
Oral history 8-53
McMillan, Angus 10-6
McQualter, Neil 13-4
Measurements 3-1
Methododology 7-1
Migrations, Macquarie perch 23-52
Mildren, Albert 10-6
Mildren, Charlie 10-6, 10-7, 10-20, 10-21
Last Upper Murray Trout cod, photo ***10-22***
Oral history 10-26
Mining
Campaspe River Catchment 14-12
Central Murray River Catchment 15-35
Goulburn River Catchment 8-5
Kiewa River Catchment 11-9
Lachlan River Catchment 18-13
Lodden River Catchment 16-15
Macquarie River Catchment 17-15
Mitta Mittta River Catchment 9-18
Murrumbidgee River Catchment 19-24
Ovens River Catchment 12-18, 12-21
Upper Murray River Catchment 10-20
Mitchell, Jane, Eildon Macquarie perch, photo ***8-17***
Mitchell, Thomas 5-7, 5-8, 5-10, 5-30, ***15-27***
Australian Aboriginal Fisheries 24-6
Broken River Catchment 13-4
Campaspe River Catchment 14-4
Central Murray River Catchment 15-4
Descriptions 5-7, 5-8, 5-30, 15-5
The first Catfish, photo ***23-58***
The first Murray cod, photo ***23-24***
The first Silver perch, photo ***23-41***
Goulburn River Catchment 8-4
Lachlan River Catchment 18-4
Lodden River Catchment 16-4
Yorta Yorta fish traps, photo ***15-9***
Mitchell, Wally 12-6, 12-18
Oral history 12-28
Trout cod from the Buffalo and Ovens Rivers, photo ***12-14***
Moira Lake Fishing Company. *See* Murray River Fishing Company 5-12
Mollison, Alexander 14-4
Montane zone
Goulburn River Catchment 8-6
Habitat types of the Murray-Darling River Basin, photo ***7-6***
Lachlan River Catchment 18-5
Macquarie River Catchment 17-8
Mitta Mittta River Catchment 9-6
Murrumbidgee River Catchment 19-8, 19-9
Ovens River Catchment 12-6
Preserved Colinton Trout cod, photo ***19-16***
Upper Murray River Catchment 10-6
Montane zone, Changes
Goulburn River Catchment 8-25
Lachlan River Catchment 18-14
Macquarie River Catchment 17-15
Mitta Mittta River Catchment 9-17
Murrumbidgee River Catchment 19-22
Moore, Frank
Broken River Catchment 13-5, 13-12
Goulburn River Catchment 8-7, 8-10, 8-11, 8-12, 8-25
Murrumbidgee River Catchment 19-10, 19-22, 19-24
Oral history 8-37
Riverina River Catchment 20-14, 20-16
Moore, Norman
Kambah catch, photo ***19-18***
Oral history 19-44
Morgan, Henry 10-4
Morris, Bill 8-25
Oral history 8-50

Mossman, Sam 18-4
Motum, Mona 18-6, 18-7, 18-13
Lachlan River Trout cod, photo ***18-11***
Oral history 18-23
Moyle, Jack 9-8, 9-9, 9-17, 9-18
Oral history 9-31
Mudford, Ron
Campaspe River Catchment 14-8
Kow Swamp catch, photo ***15-25***
Lodden River Catchment 16-6, 16-7, 16-8, 16-9, 16-14
Oral history 16-22
Mulham, Bill
Deniliquin Redfish plague, photo ***20-16***
Mathoura Trout cod, photo ***20-11***
Riverina River Catchment 20-15
Munro, Ian 5-28
Murphy, Bill 11-9
Oral history 11-11
Murray cod 23-22
Aboriginal names 23-24
Angling 23-29
Broken River Catchment 13-5, 13-6, 13-14
Campaspe River Catchment 14-4, 14-6, 14-8, 14-12, 14-14
Central Murray River Catchment 15-5, 15-6, 15-11, 15-12, 15-13, 15-15, 15-30, 15-31, 15-32, 15-37
Commercial fishing 23-28
Community value 23-28
Current status 23-29
Decline 23-29
Distribution and Habitat 23-25
European discovery 23-24
European names 23-25
Goulburn River Catchment 8-8, 8-10, 8-25
Kiewa River Catchment 11-5, 11-9
Lachlan River Catchment 18-4, 18-5, 18-8, 18-14
Lodden River Catchment 16-7, 16-8, 16-9, 16-18
Lower Murray River Catchment 21-5, 21-6, 21-7, 21-18, 21-20
Macquarie River Catchment 17-8, 17-9, 17-10, 17-15, 17-16
Mitta Mittta River Catchment 9-7, 9-17
Murrumbidgee River Catchment 19-6, 19-8, 19-9, 19-10, 19-11, 19-12, 19-22, 19-23, 19-25
Ovens River Catchment 12-4, 12-5, 12-6, 12-7, 12-8, 12-9, 12-21
Propogation 15-7
Rarity scores 23-25
Riverina River Catchment 20-6, 20-14, 20-16, 20-17
Size 23-26, 23-27
Translocations 8-5, 23-26
Trout or Murray Cod, illus. ***5-18***
Upper Murray River Catchment 10-7, 10-8, 10-20, 10-23
Murray cod, photo
A big catch near Euston, photo ***15-29***
Big cod from the Mitta Mitta, photo ***9-16***
A big cod shot, photo ***16-13***
Billabong Creek Catfish, photo ***20-12***
Boort cod catch, photo ***16-12***
Bringagee catch, photo ***19-21***
Burrendong catch, photo ***17-14***
Burrowye cod catch, photo ***10-18***
Cowra catch, photo ***18-12***
Early Echuca fishing party, photo ***15-24***
Eildon Macquarie perch, photo ***8-17***
The first Murray cod, photo ***23-24***
Fishing party near Morgan, photo ***21-15***
Gigerline Gorge Murray cod, photo ***19-17***
Howlong cod catch, photo ***15-19***
Huge cod catch at Burrowye, photo ***10-19***
Kambah catch, photo ***19-18***
Kow Swamp catch, photo ***15-25***
Laddie's catch, photo ***20-13***
Long Point cod, photo ***17-13***
McLeod's livelihood, photo ***8-24***
Mitta Mitta Cod catch, photo ***9-15***
Morning's catch at Aleandria, photo ***8-20***
Murray cod and Trout cod compared, photo ***6-4***
Murray Cod at Redesdale, photo ***14-11***
Pental Island cod, photo ***15-27***
Suffield familly catches, photo ***12-16***
Tintaldra Trout cod, photo ***10-15***
Towong cod, photo ***10-14***
Trout cod and Murray cod near Swan Hill, photo ***15-28***
Trout cod heads, photo ***6-6***
An Upland catch, photo ***8-16***
Wellington cod, photo ***17-14***
William Hill's cod catch, photo ***19-7***
Murray River fishery inquiry, 1903 5-20
Murray River Fishing Company 5-12
Central Murray River Catchment 15-6
Murtagh, George 9-7, 9-8, 9-17, 9-18, 9-19
Oral history 9-26

N

Nankervis, Ken 10-6, 10-8
Oral history 10-31

National Recovery Plan, Trout cod 23-7, 23-16
Native Fish Abundance 7-1
  Broken River Catchment 13-8
  Campaspe River Catchment 14-9
  Central Murray River Catchment 15-17
  Goulburn River Catchment 8-13
  Kiewa River Catchment 11-6
  Lachlan River Catchment 18-8
  Lodden River Catchment 16-10, 16-14
  Lower Murray River Catchment 21-10, 21-18
  Macquarie River Catchment 17-11
  Mitta Mittta River Catchment 9-10
  Murrumbidgee River Catchment 19-13
  Ovens River Catchment 12-10
  Riverina River Catchment 20-8
  Upper Murray River Catchment 10-9
Native fish, community value. *See* Community value
Native Fish Strategy 7-1
  Lower Murray River Catchment 21-21
  Murrumbidgee River Catchment 19-25
  Ovens River Catchment 12-21
Naturalist, the. *See* Stead, David
Nature's Waste Scheme 19-6
  Hill family catches, photo ***19-20***
Nesting, Catfish 23-61
Newman, Noel 18-6, 18-13
  Oral history 18-18
Newspaper accounts
  Avoca River Catchment 22-2
  Wimmera River Catchment 22-1
Newspaper extracts
  Broken River Catchment 13-15
  Campaspe River Catchment 14-15
  Central Murray River Catchment 15-38
  Goulburn River Catchment 8-30
  Kiewa River Catchment 11-9
  Lachlan River Catchment 18-15
  Lodden River Catchment 16-19
  Lower Murray River Catchment 21-22
  Macquarie River Catchment 17-17
  Mitta Mittta River Catchment 9-20
  Murrumbidgee River Catchment 19-26
  Ovens River Catchment 12-22
  Riverina River Catchment 20-18
  Upper Murray River Catchment 10-24
Nicholson, Bruce 8-8
  Oral history 8-50
Nicholson, Jock
  Campaspe River Catchment 14-7
  Central Murray River Catchment 15-31
  Murray Cod at Redesdale, photo ***14-11***
  Oral history 15-47
  Riverina River Catchment 20-7, 20-14
Norris, Greg 15-13
  Central Murray River Catchment 15-31
  Oral history 15-49
NSW Fisheries. *See* Fisheries NSW
NSW State Fisheries. *See* Fisheries NSW

O

O'Connor, Redge
  Broken River Catchment 13-4, 13-5, 13-6, 13-7, 13-12, 13-13
  Central Murray River Catchment 15-13, 15-14, 15-15
  Oral history 13-16, 15-55
  Ovens River Catchment 12-8
Ogilby, Douglas 5-14
Ottey, Joe 10-7, 10-20, 10-21
  Oral history 10-26
Overfishing, impact
  Central Murray River Catchment 15-30, 15-32
  Goulburn River Catchment 8-27
  Lower Murray River Catchment 21-19
  Riverina River Catchment 20-15
  Upper Murray River Catchment 10-21
Oxley, John 17-5

P

Parker, Bill, Hill family catches, photo ***19-20***
Parks, Ian 17-10, 17-15
  Oral history 17-30
Parsons, Frank, Mathoura Trout cod, photo ***20-11***
Passalaqua, Frank 16-6, 16-7, 16-14
  Mathoura Cod catch, photo ***20-10***
  Oral history 16-23
Paton, Nigel, Trout cod variations, photo ***6-5***
Pay, Vicki 15-11
Payne, Lee 19-9
Pearce, Henry 17-15
  Oral history 17-21
Pendergast, Bill, Upper Murray Habitat, photo ***10-12***
Pendergast, Graeme, Oral history 9-23
Pendergast, Jack 9-6, 9-7, 9-17
  Big river, photo ***9-13***
Pendergast, Margaret 9-7, 9-17
  Oral history 9-22
  Upper Mitta Trout cod, photo ***9-14***
Pendergast, Reg 9-6, 9-9, 9-17
  Oral history 9-29

Pendergast, Vince, Oral history 9-23
Perry, Muriel
Prospect Hill Trout cod, photo ***8-22***
Two trout at Moleworth, photo ***8-21***
Polkinghorne, Don 8-10, 8-11, 8-12, 8-26, 8-28
Oral history 8-54
Pollution. *See* Thermal pollution, impact; Water pollution, impact
Polly McQuinn Weir 8-28
Pratt, Bryan 19-8, 19-9, 19-10, 19-22, 19-24
Oral history 19-41
Propogation 5-20
Australian Aboriginal Fisheries 24-12, 24-13
Central Murray River Catchment 15-7, 15-11, 15-13
Golden perch 23-36
Hill family catches, photo ***19-20***
Murrumbidgee River Catchment 19-6
Trout cod 23-15
William Hill's cod catch, photo ***19-7***

R

Rankin, JB, Pental Island cod, photo ***15-27***
Rarity scores
Blackfish 23-67
Broken River Catchment 13-8
Campaspe River Catchment 14-9
Catfish 23-59
Central Murray River Catchment 15-17
Golden perch 23-35
Goulburn River Catchment 8-13
Kiewa River Catchment 11-6
Lachlan River Catchment 18-9
Lodden River Catchment 16-10
Lower Murray River Catchment 21-10
Macquarie perch 23-50
Macquarie River Catchment 17-11
Mitta Mittta River Catchment 9-10
Murray cod 23-25
Murrumbidgee River Catchment 19-13
Ovens River Catchment 12-10
Riverina River Catchment 20-8
Silver perch 23-42
Trout cod 23-8
Upper Murray River Catchment 10-9
Rarity scores, definition 7-2
Rarity scores, description 7-1, 7-2
Rarity scores, methodololgy 7-1
Read, Ken 14-8, 14-9, 14-12
Oral history 14-19
Recommendations 25-1
Recreational fishing. *See* Angling
Reddrop, Reg, Big Trout cod in the past, photo ***23-18***
Redfin perch, introduction
Broken River Catchment 13-12, 13-13, 13-14
Campaspe River Catchment 14-13
Central Murray River Catchment 15-30, 15-32, 15-35
Deniliquin Redfish plague, photo ***20-16***
Goulburn River Catchment 8-28
Kiewa River Catchment 11-9
Lachlan River Catchment 18-14
Lodden River Catchment 16-14, 16-15, 16-16
Lower Murray River Catchment 21-20
Macquarie River Catchment 17-16
Mitta Mittta River Catchment 9-18
Murrumbidgee River Catchment 19-5, 19-23
Ovens River Catchment 12-5, 12-19, 12-20
Riverina River Catchment 20-15, 20-16
Upper Murray River Catchment 10-21
Regulation of fishing 5-14
Australian Aboriginal Fisheries 24-12
Blackfish 23-70
Catfish 23-62
Central Murray River Catchment 15-7, 15-32, 15-33, 15-37
Golden perch 23-37
Lower Murray River Catchment 21-5, 21-9, 21-19
Macquarie perch 23-54
Murray cod 23-29
Murrumbidgee River Catchment 19-8
Riverina River Catchment 20-5
Trout cod 23-15
Reynolds, Keith, Trout cod at Tongalong, photo ***15-21***
Reynolds, Ron 15-13, 15-14, 15-31
Oral history 15-47
Rhodes, Jack
Central Murray River Catchment 15-11, 15-12
Kiewa River Catchment 11-4, 11-5, 11-10
Mitta Mittta River Catchment 9-6, 9-17
Oral history 9-22, 10-26, 11-11
Ovens River Catchment 12-20
Trout cod from Lake Sambell, photo ***12-15***
Upper Murray River Catchment 10-4, 10-5, 10-6, 10-7, 10-8
Richardson, John 5-10
The first Golden perch, photo ***23-33***
Gunther's Golden perch, photo ***17-7***
Rickson, Aussie, Upper Murray Habitat, photo ***10-12***
River Murray Commission 9-6, 21-19
Robbins, Doug 17-8, 17-9, 17-15

Oral history 17-23
Roberts, Bert
Big Trout cod in the past, photo ***23-18***
Broken River Catchment 13-6, 13-7
Central Murray River Catchment 15-13, 15-14, 15-31
Oral history 15-44
Robinson, George Augustus 9-4, 9-5
Roughley, Theodore 5-29
Central Murray River Catchment 15-13
Rumbolt, Bill 16-8, 16-9, 16-14, 16-15, 16-16
Oral history 16-24
Russell, Ian, Tintaldra Trout cod, photo ***10-15***
Rutzou, Terry
Central Murray River Catchment 15-11
Murrumbidgee River Catchment 19-9, 19-10, 19-22
Oral history 19-41
Ryan, Pat 17-10, 17-15
Oral history 17-29
Ryrie, David 19-8, 19-9, 19-10, 19-22
Colinton Gorge Trout cod, photo ***19-15***
Gigerline Gorge Murray cod, photo ***19-17***
Oral history 19-39
Preserved Colinton Trout cod, photo ***19-16***

S

Salmonids, introduction
Lodden River Catchment 16-7
Mitta Mittta River Catchment 9-18
Sawell, Bill 17-8, 17-15
Oral history 17-22
Scales, Collin 9-8
Oral history 9-28
Scholes, Robert 16-8, 16-9, 16-14
Oral history 16-24
Scott, Trevor, They call the Trout cod the Rock cod, photo ***21-16***
Sea to Hume Dam Fishway Program 15-37, 21-21
Sharpe, Eugene 17-10
Silting, impact
Broken River Catchment 13-13
Campaspe River Catchment 14-12
Central Murray River Catchment 15-35
Goulburn River Catchment 8-26, 8-27
Kiewa River Catchment 11-9
Lachlan River Catchment 18-13
Lodden River Catchment 16-15
Murrumbidgee River Catchment 19-23, 19-24
Ovens River Catchment 12-19
Silver perch 23-29
Aboriginal names 23-41
Angling 23-44
Broken River Catchment 13-7, 13-12, 13-13
Campaspe River Catchment 14-7, 14-8
Central Murray River Catchment 15-4, 15-5, 15-6, 15-11, 15-14, 15-16, 15-30, 15-31, 15-32, 15-34, 15-37
Commercial fishing 23-44
Community value 23-44
Current status 23-44
Decline 23-44
Distribution 23-42
European discovery 23-41
European names 23-42
Goulburn River Catchment 8-9, 8-11, 8-12, 8-25, 8-26
Habitat 23-42
Lachlan River Catchment 18-4, 18-5, 18-7, 18-13, 18-14
Lodden River Catchment 16-8, 16-9, 16-14, 16-18
Lower Murray River Catchment 21-6, 21-18, 21-20
Macquarie River Catchment 17-5, 17-8, 17-9, 17-10, 17-15, 17-16
Mitta Mittta River Catchment 9-9, 9-17
Murrumbidgee River Catchment 19-9, 19-10, 19-11, 19-12, 19-22, 19-23, 19-24
Ovens River Catchment 12-7, 12-8, 12-18
Rarity scores 23-42
Riverina River Catchment 20-7, 20-14, 20-16, 20-17
Size 23-43
Translocations 8-6, 8-11, 23-43
Upper Murray River Catchment 10-8, 10-20
Silver perch, photo
A big catch near Euston, photo ***15-29***
Burrendong catch, photo ***17-14***
Early Barmah catch, photo ***15-22***
The first Silver perch, photo ***23-41***
Fishing party near Morgan, photo ***21-15***
Hill family catches, photo ***19-20***
Kow Swamp catch, photo ***15-25***
Silver perch at Yarrawonga, photo ***15-20***
Trout cod and Silver Perch at Burrowye, photo ***10-17***
Simmie, Bill, Mathoura Trout cod, photo ***20-11***
Size
Blackfish 23-69
Catfish 23-61
Golden perch 23-36
Macquarie perch 23-52
Murray cod 23-26, 23-27

Silver perch 23-43
Trout cod 23-11
Slopes zone
Broken River Catchment 13-5, 13-14
Campaspe River Catchment 14-6
Goulburn River Catchment 8-7, 8-8, 8-9, 8-10
Habitat types of the Murray-Darling River Basin, photo ***7-6***
Kiewa River Catchment 11-5
Lachlan River Catchment 18-7
Lodden River Catchment 16-6
Macquarie River Catchment 17-9, 17-10
Mitta Mittta River Catchment 9-8
Murrumbidgee River Catchment 19-11
Ovens River Catchment 12-7, 12-21
Riverina River Catchment 20-5
Slopes habitat in the Goulburn, photo ***8-18***
Upper Murray Habitat, photo ***10-12***
Upper Murray River Catchment 10-7
Slopes zone, Changes
Broken River Catchment 13-12
Campaspe River Catchment 14-12
Goulburn River Catchment 8-25, 8-27
Lodden River Catchment 16-14
Macquarie River Catchment 17-15
Mitta Mittta River Catchment 9-17
Murrumbidgee River Catchment 19-22
Ovens River Catchment 12-18, 12-19
Riverina River Catchment 20-14
Upper Murray River Catchment 10-20
Smith, Ken 17-8
Oral history 17-21
Snagging, impact
Broken River Catchment 13-13
Central Murray River Catchment 15-33, 15-36
Goulburn River Catchment 8-26
Lower Murray River Catchment 21-19
Murrumbidgee River Catchment 19-23
Ovens River Catchment 12-19
Pental Island cod, photo ***15-27***
Riverina River Catchment 20-14, 20-15
Trout cod 23-15
Upper Murray River Catchment 10-21
Snowy Mountains Hydroelctric Scheme 10-22
Southern, Sammy, Mathoura Trout cod, photo ***20-11***
Species
Discussion 5-25, 5-30, 7-4
Identification 5-10, 5-11, 5-14, 7-4
Species summaries. *See individual species*
Stacey, Veeny 18-6, 18-7
Oral history 18-21
Stapylton, Grantville 13-4
Stead, David 5-20, 5-21, 5-27
Discovery of Trout Cod 5-21
A feature article on a mystical fish, illus ***5-26***
The First photograph, photo ***5-24***
First Trout Cod, photo. ***5-24***
Lodden River Catchment 16-7
Lower Murray River Catchment 21-5
Murrumbidgee River Catchment 19-6, 19-9, 19-12
Murrumbidgee Trout cod, photo ***19-19***
Riverina River Catchment 20-5, 20-6, 20-8
William Hill's cod catch, photo ***19-7***
Stewart, Beverly, Big cod from the Mitta Mitta, photo ***9-16***
Stillman, Les
Eildon Macquarie perch, photo ***8-17***
Morning's catch at Aleandria, photo ***8-20***
Stillman, Russell
Eildon Macquarie perch, photo ***8-17***
Goulburn River Catchment 8-7, 8-8, 8-9, 8-10, 8-25, 8-27, 8-28
Morning's catch at Aleandria, photo ***8-20***
Oral history 8-44
Riverina River Catchment 20-7, 20-14, 20-16
Trout cod on a pole, photo ***8-19***
Stock, David 17-9, 17-15
Oral history 17-22
Stone traps 24-8, 24-10, 24-11
Brewarrina Stone Fisheries, figure ***24-9***
Brewarrina Stone Fisheries, photo ***24-9***
Central Murrumbidgee River Stone Fishery, photo ***24-11***
Upper Murray River Catchment 10-4
Strudwick, Shane, Fishing party near Morgan, photo ***21-15***
Struilby, Lawrence 9-4
Sturt, Charles
Australian Aboriginal Fisheries 24-6
Central Murray River Catchment 15-4, 15-16
Lower Murray River Catchment 21-4
Macquarie River Catchment 17-5
Murrumbidgee River Catchment 19-4
Suffield, Max 12-6, 12-8, 12-9, 12-18, 12-19
Last Trout cod int the Ovens, photo ***12-17***
Oral history 12-33
Suffield famillly catches, photo ***12-16***
Surrey, Bill, Trout cod from Lake Sambell, photo ***12-15***
Sustainable Rivers Audit (2008) 7-1, 7-2
Broken River Catchment 13-4, 13-14

Campaspe River Catchment 14-6, 14-14
Central Murray River Catchment 15-10, 15-37
Goulburn River Catchment 8-6, 8-29
Habitat types of the Murray-Darling River Basin, photo ***7-6***
Kiewa River Catchment 11-4
Lachlan River Catchment 18-5, 18-14
Lodden River Catchment 16-5, 16-18
Lower Murray River Catchment 21-6, 21-21
Macquarie River Catchment 17-7, 17-16
Mitta Mittta River Catchment 9-6, 9-19
Murrumbidgee River Catchment 19-8, 19-24
Ovens River Catchment 12-5, 12-21
Riverina River Catchment 20-5, 20-8
Upper Murray River Catchment 10-5, 10-23

T

Tagging
Lower Murray River Catchment 21-19
Murrumbidgee River Catchment 19-6
Riverina River Catchment 20-5, 20-6, 20-7
William Hill's cod catch, photo ***19-7***
Taig, Una 14-7, 14-8, 14-12, 14-13
Oral history 14-18
Tench, introduction
Broken River Catchment 13-13
Campaspe River Catchment 14-13
Central Murray River Catchment 15-30, 15-35
Lachlan River Catchment 18-14
Lodden River Catchment 16-15
Macquarie River Catchment 17-16
Riverina River Catchment 20-16
The Forge ***17-13***
Thermal pollution, impact
Broken River Catchment 13-13
Campaspe River Catchment 14-13
Central Murray River Catchment 15-34
Goulburn River Catchment 8-27
Lower Murray River Catchment 21-19
Macquarie River Catchment 17-16
Mitta Mittta River Catchment 9-19
Murrumbidgee River Catchment 19-24
Ovens River Catchment 12-19
Upper Murray River Catchment 10-22
Thompson, Herb 17-8, 17-9, 17-15
Toland, Gordon, Upper Mitta Trout cod, photo ***9-14***
Translocations 5-12, 5-15, 5-20, 5-22, 5-28
Australian Aboriginal Fisheries 24-12, 24-13
Blackfish 23-68
Broken River Catchment 13-4, 13-12
Campaspe River Catchment 14-8, 14-12
Catfish 23-60
Central Murray River Catchment 15-6
Golden perch 23-36
Goulburn River Catchment 8-5, 8-6, 8-7, 8-11, 8-25, 8-26, 8-28, 8-29
Hill family catches, photo ***19-20***
Lachlan River Catchment 18-6, 18-14
Lodden River Catchment 16-5, 16-6, 16-7, 16-15
Lower Murray River Catchment 21-5, 21-20
Macquarie perch 23-51
Macquarie River Catchment 17-8
Murray cod 23-26
Murrumbidgee River Catchment 19-5, 19-6, 19-9, 19-10, 19-11, 19-12, 19-24
Ovens River Catchment 12-5, 12-20, 12-21
Riverina River Catchment 20-7, 20-14
Silver perch 23-43
Trout cod 23-10, 23-15
Upper Murray River Catchment 10-6
William Hill's cod catch, photo ***19-7***
Trefall, Ken
Broken River Catchment 13-7
Goulburn River Catchment 8-10, 8-11, 8-12, 8-26
Oral history 8-55
Triangulation 7-4
Trout cod 23-3, 25-4
Aboriginal names 23-5
Biology 5-27
Biology of native fish 23-12
Broken River Catchment 13-5, 13-6, 13-12
Campaspe River Catchment 14-7, 14-8, 14-12, 14-14
Central Murray River Catchment 15-5, 15-6, 15-11, 15-12, 15-13, 15-16, 15-30, 15-31, 15-32, 15-37
Community value 23-13
Current status 23-15
Decline 23-15
Discovery by Stead 5-21
Distribution and Habitat 23-7
European discovery 23-5
European names 23-6
A feature article on a mystical fish, illus ***5-26***
Features ***6-5***, ***6-6***
First Trout Cod, Illus. ***5-9***
The First Trout cod, phot ***23-5***
Goulburn River Catchment 8-7, 8-8, 8-9, 8-10, 8-11, 8-25
Kiewa River Catchment 11-5, 11-10
Lachlan River Catchment 18-6, 18-7, 18-13, 18-14

Lodden River Catchment 16-7, 16-9
Lower Murray River Catchment 21-6, 21-7, 21-18, 21-19
Macquarie River Catchment 17-8, 17-9, 17-10, 17-15, 17-16
Mitta Mittta River Catchment 9-6, 9-7, 9-17
Murrumbidgee River Catchment 19-9, 19-10, 19-11, 19-12, 19-22, 19-24, 19-25
Ovens River Catchment 12-5, 12-6, 12-7, 12-8, 12-9, 12-18, 12-20, 12-21
Propogation 5-28, 15-7
Rarity scores 23-8
Riverina River Catchment 20-6, 20-7, 20-14, 20-17
Size 23-11
Translocations 8-5, 8-6, 8-29, 23-10
Trout or Murray cod, illus. ***5-18***
Upper Murray River Catchment 10-6, 10-7, 10-8, 10-20, 10-23
Trout cod, photo
Big cod from the Mitta Mitta, photo ***9-16***
Big Trout cod in the past, photo ***23-18***
Blandowski's Trout cod, photo ***5-16***
Broken River Trout Cod, photo ***13-10***
Burrowye cod catch, photo ***10-18***
Colinton Gorge Trout cod, photo ***19-15***
Eildon Macquarie perch, photo ***8-17***
Eurobin catches, photo ***12-13***
The First photograph, photo ***5-24***
First Trout Cod, photo. ***5-24***
A giant Trout cod today, photo ***23-19***
Homewood cod catch, photo ***8-23***
Howlong cod catch, photo ***15-19***
Huge cod catch at Burrowye, photo ***10-19***
Lachlan River Trout cod, photo ***18-11***
Lake Sambell Trout cod, photo ***5-32***
Last Trout cod int the Ovens, photo ***12-17***
Last Upper Murray Trout cod, photo ***10-22***
Long Point cod, photo ***17-13***
Mathoura Trout cod, photo ***20-11***
Mitta Mitta Cod catch, photo ***9-15***
Morning's catch at Aleandria, photo ***8-20***
Murray cod and Trout cod compared, photo ***6-4***
Murray Cod at Redesdale, photo ***14-11***
Murrumbidgee Trout cod, photo ***19-19***
Oligorous gibbiceps, photo ***5-19***
Preserved Colinton Trout cod, photo ***19-16***
Prospect Hill Trout cod, photo ***8-22***
Purnong Trout cod, photo ***21-16***
The Seven Creeks: a last upland refuge, photo ***23-20***
They call the Trout cod the Rock cod, photo ***21-16***
Tintaldra cod catch, photo ***10-16***
Tintaldra Trout cod, photo ***10-15***
Towong cod, photo ***10-14***
Trout cod and Murray cod near Swan Hill, photo ***15-28***
Trout cod and Silver Perch at Burrowye, photo ***10-17***
Trout cod at Tongalong, photo ***15-21***
Trout cod from Lake Sambell, photo ***12-15***
Trout cod from the Buffalo and Ovens Rivers, photo ***12-14***
Trout cod heads, photo ***6-6***
Trout cod on a pole, photo ***8-19***
Trout cod variations, photo ***6-5***
Two trout at Moleworth, photo ***8-21***
An Upland catch, photo ***8-16***
Upper Mitta Trout cod, photo ***9-14***
Variations, photo. ***7-7***
Whitney's Trout cod, photo ***5-25***
Tubb, John 5-28, 15-13
Central Murray River Catchment 15-7
Turnball, Alec 9-6, 9-7, 9-8, 9-9, 9-17, 9-18
Oral history 9-30

U

Upland zone
Broken River Catchment 13-5
Campaspe River Catchment 14-6
Goulburn River Catchment 8-7
Habitat types of the Murray-Darling River Basin, photo ***7-6***
Lachlan River Catchment 18-6
Lodden River Catchment 16-6
Macquarie River Catchment 17-9
Mitta Mittta River Catchment 9-7
Murrumbidgee River Catchment 19-9, 19-11
Ovens River Catchment 12-6, 12-21
Upper Murray River Catchment 10-7
Upland zone, Changes
Broken River Catchment 13-12
Campaspe River Catchment 14-13
Goulburn River Catchment 8-25
Lachlan River Catchment 18-13, 18-14
Macquarie River Catchment 17-15
Mitta Mittta River Catchment 9-17
Murrumbidgee River Catchment 19-22
Ovens River Catchment 12-18
Upper Murray River Catchment 10-20
Uren, John 17-9, 17-15, 17-16

Oral history 17-26

V
Valenciennes, Achille 5-5, 5-7, 5-8, 17-6, 17-8
Validation of historical accounts 7-4
Vidler, Graham 15-12, 15-13, 15-14, 15-15, 15-31
Oral history 15-46

W
Wait, Graham, Oral history 14-18
Wallden,Cyril 13-6, 13-7, 13-13
Oral history 13-18
Walsh, Stan 9-7, 9-8, 9-9, 9-17, 9-18
Oral history 9-25
Walton, Betty 10-7, 10-20
Oral history 10-31
Water pollution, impact
Broken River Catchment 13-14
Campaspe River Catchment 14-12
Central Murray River Catchment 15-30, 15-34, 15-35
Goulburn River Catchment 8-27
Kiewa River Catchment 11-9
Lodden River Catchment 16-15
Lower Murray River Catchment 21-18, 21-20
Mitta Mittta River Catchment 9-18
Murrumbidgee River Catchment 19-23, 19-24
Ovens River Catchment 12-18, 12-20
Riverina River Catchment 20-15
Upper Murray River Catchment 10-20, 10-21
Weatherly, Allan 5-30, 6-1
Goulburn River Catchment 8-5
Lake Sambell Trout cod, photo ***5-33***
Webster, John 20-4
Wedlick, Lance 12-8
Trout cod from the Buffalo and Ovens Rivers, photo ***12-14***
Weir and Dam construction, impact 9-6
Broken River Catchment 13-7, 13-12, 13-13
Campaspe River Catchment 14-13
Central Murray River Catchment 15-10, 15-33, 15-34, 15-35
Kiewa River Catchment 11-9
Lachlan River Catchment 18-7, 18-13, 18-14
Lodden River Catchment 16-16
Lower Murray River Catchment 21-5, 21-19
Macquarie River Catchment 17-15, 17-16
Mitta Mittta River Catchment 9-19
Murrumbidgee River Catchment 19-9, 19-10, 19-22, 19-24
Ovens River Catchment 12-19, 12-21
Riverina River Catchment 20-15
Upper Murray River Catchment 10-21, 10-22
Weir traps 24-6
Whateley, Julie, Trout cod and Murray cod near Swan Hill, photo ***15-28***
White eye. *See* Macquarie perch
Whitehead, John, Upper Murray Habitat, photo ***10-12***
Whitley, Gilbert 5-27, 5-28
Whitney's Trout cod, photo ***5-25***
Wilshire, Osbourne 5-14
Riverina River Catchment 20-4, 20-6
Wilson, Edward 8-5
Wilson, Kevin 14-6, 14-8
Oral history 14-18
Wilson, Norm 15-13, 15-14, 15-15, 15-31, 15-32, 15-34
Oral history 15-51
Wimmera River Catchment Newspaper accounts 22-1
Winter, Gordon 19-6, 19-8, 19-9

Y
Yea, John 9-17
Oral history 9-28
Yea, Tom 9-8, 9-9, 9-17, 9-18
Oral history 9-27

Z
Zeitz, Amandus 5-20
Zela, Jimmy, Burrendong catch, photo ***17-14***
Zones. *See* Montane zone, Upland Zone, Slopes Zone, Lowland Zone

True Tales of the Trout Cod: River Histories of the Murray–Darling Basin is written by Will Trueman. It combines oral history and science to investigate the changes to native fish populations in parts of the Basin and has a particular focus on the Trout cod, a fish that is intriguing to many and has little known about it.

Will combines his piscatorial knowledge with stories, science, newspaper articles, fishing records and historic photographs to produce a beautifully written insight into the rivers, fish and people of the Murray–Darling Basin.

The way things were in the past are gone. Those times won't be back. But people should know how it once was.

George Murtagh, Mudgeegonga, October 2006