

2017 MURRAY CODFERENCE

CONFERENCE PROCEEDINGS

Sunday 10th December, East Side Conference Centre, Shepparton



Target One Million
More Victorians fishing, more often



Partners



Target One Million
More Victorians fishing, more often



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Aboriginal acknowledgement

The Victorian Government proudly acknowledges Victoria's Aboriginal community and their rich culture and pays respect to their Elders past, present and emerging.

We acknowledge Aboriginal people as Australia's first peoples, and as the Traditional Owners and custodians of the land on which we work and live.

We recognise the strength of Aboriginal people and communities and value the ongoing contribution of Aboriginal people and communities to Victorian life, through their daily work and at key events, and how this enriches us all.

We recognise all Aboriginal cultures and communities are diverse, and should be celebrated.

We acknowledge that the land and water is of spiritual, cultural and economic importance to Aboriginal people. We embrace the spirit of reconciliation: guaranteeing equality of outcomes and ensuring an equal voice.

We have distinct legislative obligations to Traditional Land Owner groups that are paramount in our responsibilities in managing Victoria's resources.

Foreword

Our native fisheries are unique and well loved by anglers far and wide. Whether its chasing Murray cod in our snaggy lowland rivers, catching springtime golden perch in Lake Eildon or, wrestling a catfish out of the Wimmera river, native fish are special.

Our **Target One Million** program is helping to rebuild native fisheries as we stock record numbers of native fish, improve fishing access and work with other agencies to improve fish habitat.



Here are some examples of what we're doing to improve native fisheries:

- ✓ We have increased native fish stocking to four million fish a year. This includes 300,000 bass into Gippsland waters this summer, 100,000 golden perch and 50,000 cod into Cairn Curran and 60,000 cod and golden perch into Lake Boga.
- ✓ We are on track to stock 400,000 native fish at Rocklands Reservoir this summer and we are establishing a high quality stocked estuary perch fishery in Devilbend Reservoir. We have opened trout cod fisheries at Lakes Sambell and Kerferd.
- ✓ We have created new boating access at Blue Rock Reservoir and boating access and a jetty extension at Devilbend Reservoir.
- ✓ For the first time we are stocking 12 northern family friendly waters with silver perch and we have delivered six Vic Fish Kids events to encourage young fisher participation.
- ✓ And the Angler Riparian Partnership Program is restoring fish habitat and there is now an on-line searchable fish stocking data base for recreational fishers.

It's great to see Victorian native fish anglers working closely with the Victorian Fisheries Authority and other agencies to build our trout fisheries.

The Andrews Labor Government is serious about developing our recreational fisheries and has committed a record \$46 million toward these and other Target One Million projects that will create a legacy for many years to come.

I wish every native fish angler the best of luck this season and I hope you will get a lot out of the Murray Codference.

Jaala Pulford, MLC
Minister for Agriculture

Target One Million

More Victorians fishing, more often

Recreational fishing is important to our social and economic well being. It is one of the most treasured pastimes, contributing significantly to families and communities.

By working with fishers, Target One Million will grow recreational fishing, get more families outdoors and increase participation to one million anglers by 2020.

To do List – **all on track**

The State Government has committed to delivering its Target One Million plan for recreational fishing, which will get more Victorians fishing more often.

- ✓ Ban commercial netting in Port Phillip Bay
- ✓ Local advisory committee for Lake Toolondo
- ✓ Establish a marine stocking program
- ✓ Open trout cod fisheries at Beechworth
- ✓ Stock barramundi into Hazelwood Pondage
- ✓ Remove boating restrictions at Blue Rock Lake
- ✓ \$2,000 grants to fishing clubs
- ✓ School education and children's fishing programs
- ✓ Growing the trout opening festival
- ✓ Better fishing facilities program
- ✓ Ban netting at Gippsland lakes' river mouths
- ✓ Make Fisheries Victoria a statutory authority
-  Increase stocking from 3 to 5 million fish a year



Conference program

8.30 to 9.00 am	Registration & coffee	
9.00 to 9.05 am	Housekeeping	John Douglas, VFA
9.05 to 9.15 am	Welcome to Country	Yorta Yorta Nation
9.15 to 9.30 am	Conference launch (Target One Million)	Travis Dowling, VFA
9.30 to 10.00 am	Keynote summary: Our native fish revolution	Steve Starling
Session 1: Building Great Native Fisheries (Chair, Brian Mottram)		
10.00 to 10.20 am	Our flagship native fisheries (and how we got there)	Anthony Forster, VFA
10.20 to 10.40 am	Habitat, flows and stocking – The triple treat for native fish in Gunbower Creek	Louissa Rogers, NCCMA
10.40 to 11.10 am	Morning tea / coffee	
11.10 to 11.30 am	Angler's putting back - Your licence fees at work	Michael Burgess, VRFish
11.30 to 11.50 am	Native fish report card program	John Douglas, VFA
Session 2: Innovation & Opportunity (Chair, Michelle Wenner)		
11.50 to 12.10 pm	Better fish habitat in lakes - lessons from overseas	Andrew Norris, QLD DPI
12.10 to 12.30 pm	Care for cod campaign launch	Anthony Forster, VFA
12.30 to 12.50 pm	National Carp Control Plan update and the Victorian perspective	Craig Ingram, VFA
12.50 to 1.40 pm	Lunch	
Session 3: On the Hook - Fishing for Natives (Chair, Rob Loats)		
1.40 to 2.00 pm	The Ovens River, from rags to riches	Robbie Alexander
2.00 to 2.20 pm	Cod Culture	John Cahill
2.20 to 2.40 pm	Luring lessons hard earned	Marc Ainsworth
Session 4: Working together - Open session (Chair, Travis Dowling)		
2.40 to 3.30 pm	From the floor- Questions & Answers	All
3.30 to 3.45 pm	What I got out the conference	Graeme Dear
3.45 to 4.00 pm	Acknowledgements	Travis Dowling, VFA
4.00 pm	Close & afternoon refreshments	

Our native fish revolution - From spears, traps & set-lines to baitcasters and swimbaits

Steve 'Starlo' Starling

2017 Murray Codference keynote presenter

There's been a quiet revolution in public attitudes regarding Australia's inland native fish species over the past three or four decades. These unique fish — and especially the mighty Murray cod — are no longer regarded as an easily-harvested commodity, nor as a poor second-best to introduced trout and salmon. Today, we're in the midst of a genuine Murray cod renaissance: one driven by passionate anglers and committed environmental crusaders (who are often one in the same person!).

In my keynote address to the 2017 Murray Codference, I look back at the chequered history and mixed fortunes of our embattled freshwater natives — from the time of European settlement to the present day — and offer some thoughts on what the future might possibly hold for these remarkable fish, and for people like myself who care deeply about them.



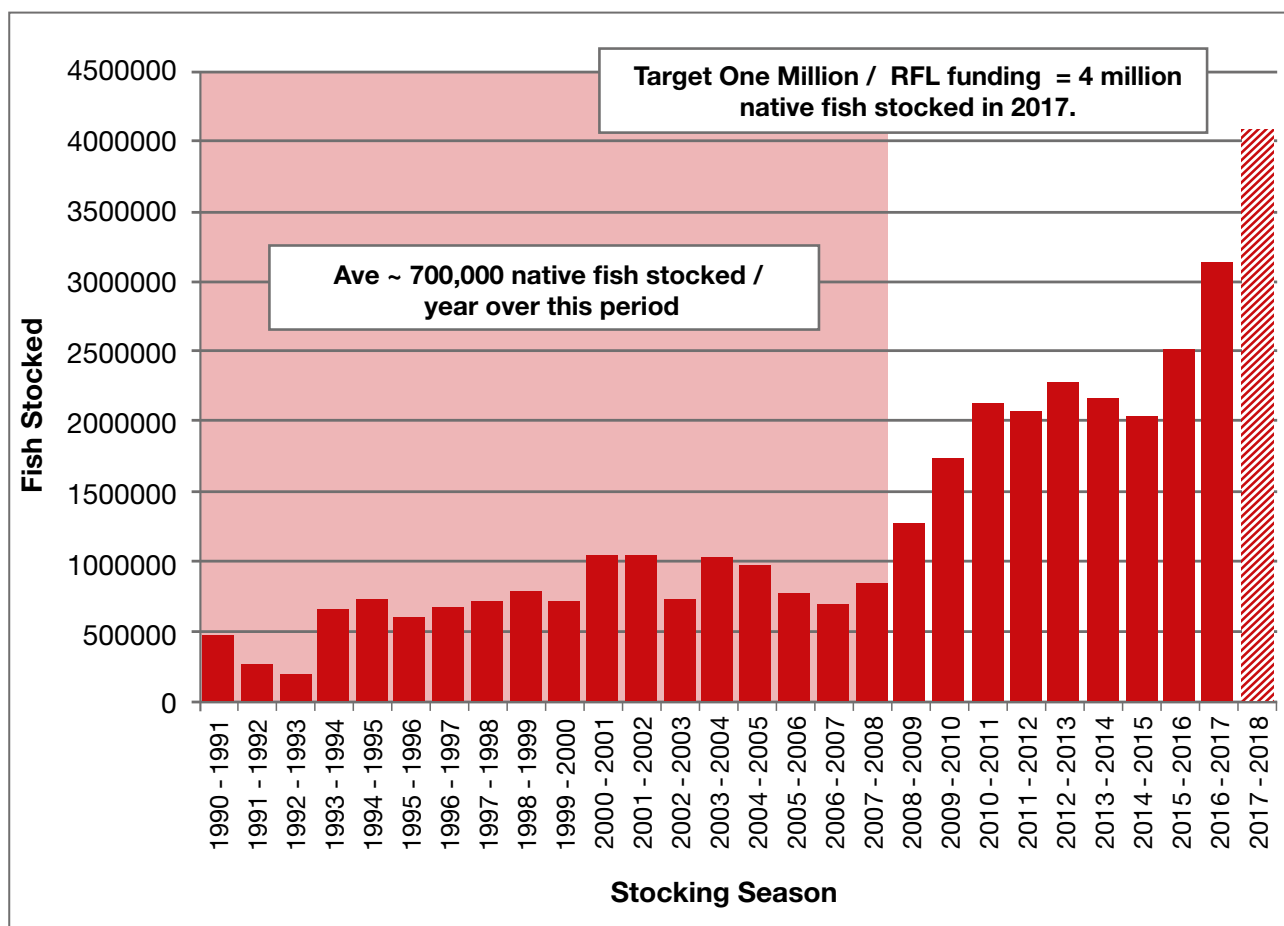
Our flagship native fisheries - and how we got there

Anthony Forster

Manager Freshwater Fisheries, Victorian Fisheries Authority

Our native fisheries need help because rivers across the Murray Darling Basin have been highly modified and over regulated for more than 150 years. Water extraction, barriers to fish movement, de-snagging, erosion, siltation, reverse season flows and thermal pollution, all hold back native fish breeding, migration and survival. This is the operating environment in which Fisheries Managers do their work.

The good news is, by investing in habitat restoration, putting snags back, increasing fish stocking and removing barriers to fish movement we are bring native fish back. There's a lot more to do but even over the last decade, the results are more than encouraging – they are in some cases, quite remarkable.



Annual native fish stockings has increased almost 5 fold since the 1990's, culminating in 4 million stocked fish this year under the Target One Million program.

Since 1990, the Victorian Fisheries Authority (formerly Fisheries Victoria) has stocked more than 30 million native fish in hundreds of waterways.

Here's the low down on some of Victoria's established, developing and proposed native recreational fisheries.

Established (flagship) native fisheries

Lake Eildon:

Native fish stocking in Lake Eildon between 1990 and 1995 focussed on small numbers of golden perch. While golden perch and Murray cod stocking numbers increased modestly up until 1999, it wasn't until after this that stocking numbers increased significantly (100,000 to 150,000 fish / year). This level of stocking saw the emergence of a spring-time golden perch fishery in the early 2000's as these fish started coming through the fishery.

It was only from 2008 onward, we stocked larger numbers of Murray cod in Lake Eildon. Buoyed by our golden perch experience, we increased fish stocking numbers for both golden perch and Murray cod, culminating in the stocking of more than 1 million Murray cod over three years between 2011 and 2013.

This "pulse stocking" approach has now realised a large population of Murray cod between 60 and 80 cm. Since then, we have settled into a maintenance stocking program of around 150,000 golden perch and 100,000 Murray cod each year.

Kerang Lakes: (Kangaroo, Charm & Boga)

These and other Kerang lake waters were commercial fished (schedule 8 of the Fisheries Act) for many years until a commercial fishing entitlements were bought out in 2003. Since then,



Lake Eildon is coming of age as one of the best stocked cod fisheries in Australia. Pulse stocking and tight slot limit regulations will see this fishery get better and better.

a concerted effort to stock these waters with Murray cod and golden perch has created high quality native fisheries, particularly in Kangaroo Lake and Lake Charm. Recent installation of 94 fish havens in Kangaroo and Lake Boga are showing early signs of aggregating both stocked fish and silver perch and good angling.

The Ovens River:

The Ovens River between Myrtleford and where it joins Lake Mulwala (Bundalong) has the largest river population of Murray cod in the state. It also holds a good population of golden perch in the lower reaches and a recovering population of trout cod. More than 280,000 trout cod were stocked in this water between 1997 and 2006. Recent efforts to stock Macquarie perch are also working. The Ovens River is a shining example of an unregulated and environmentally protected river that supports self-sustaining population of Murray cod – they breed naturally. Over the last decade, considerable habitat restoration works (fencing to stop livestock, installing snags & removing barriers to fish movement) have made a big difference to the fishery.



A wild Ovens River Murray cod caught by the author.



Developing fisheries

There are long list of native fisheries that are “a work in progress” and are starting to deliver encouraging results. Here are a few of those that are showing real potential over the next 5 years:

Lake Nagambie (including mid-Goulburn River)

Before 2009, stocking in Lake Nagambie was limited to around 10,000 golden perch / year. From 2009, stocking numbers increased to 150,000 - 200,000 golden perch / year and 50,000 - 100,000 Murray cod / year. This “pulse stocking” created a high quality native fishery at Lake Nagambie, and the Goulburn river that runs through it. Angling club catch surveys have clearly showed the emergence of native stocked fish.

Rich habitat diversity and instream timber (flooded forest) will sustain a high quality and developing native fishery well into the future.

Honourable mentions

There are many other developing native fisheries that deserve a mention including; Lake Eppalock, Lake Nillahcootie, Cairn Curran, Gunbower Creek, Taylors Lake and Lake Buffalo. All of these waters on their day can produce exciting native fishing opportunities and, all are expected to improve over time.

Gippsland Bass:

At the southern end of the natural range, Gippsland bass have been held back by water regulation priorities including, water storages, barriers to migration and low flows during the millennium drought. Bass need high spring flows all the way to the estuary to successfully breed and these scenarios now occur infrequently.

Between 1996 and 2004 around 233,000 bass were stocked into a limited number of Gippsland waters and the crater lakes. Bass stocking recommenced in 2009 and since then around 780,000 have been stocked in Gippsland lakes and rivers including; the Snowy, Macalister, Avon, Mitchell, Tambo and Nicholson Rivers (and smaller streams). Blue Rock Lake and Lake Glenmaggie are our best lake bass fisheries. In some waters, it's taken more than 10 years for the results of stocking to transform into a quality recreational fishery.

This year, we are proposing to increase bass stocking in Gippsland river and lakes to more than 300,000.



Since 1996, more than a million bass have been stocked, mainly in the Gippsland lakes and rivers. After a 4 year hiatus, stocking recommenced in 2009 and has steadily increased to more than 100,000 each year. Were on track to stock a record 300,000 bass this summer.

Stocked estuary perch:

In 2010, Fisheries started an Australian first campaign for large-scale breeding and stocking of estuary perch in collaboration with a bass farmer in New South Wales and tournament anglers who collected the brood stock under the "Perch Search" program. Since then we have stocked over 500,000 estuary perch into 14 waterways. The best performing of these waters are Devilbend Reservoir, Struan Dam, Werribee River and Albert Park Lake. Estuary perch over the legal size (27 cm) are now routinely caught in some of the earlier stocked waters. Estuary perch live for more than 40 years and can grow well over 50 cm.

Nagambie Angling Club Kirwins Bridge Competition Records 2003-2013: Golden Perch



Murray cod and golden perch catches are a direct result of 'pulse stocking' in Lake Nagambie since 2009.

Around the corner

With continued state government support, there are a host of other opportunities to further develop inland recreational fishers. We have plans to stock Rocklands Reservoir with Murray cod, golden perch and estuary perch, subject to the outcomes of a fish stocking risk assessment process. Rocklands Reservoir is one of the largest water storages in Victoria with vast amounts of flooded forest timber structure, a temperate / warm climate, water security and deep refuge pools (old river course). These features are ideally suited to the establishing a quality native fishery.

Lessons learned

On reflection and after a concerted effort to improve native fisheries, over the last decade, here are some key lessons learned:

1. Because most of our waterways are so modified, we can't expect our native fisheries to breed and recover without well informed fishery interventions, such as stocking and habitat restoration.

2. Combining fish stocking with habitat works to achieve great synergy.

3. Increased government support for recreational fishing, particularly in the last decade has accelerated efforts to recover existing and develop new fisheries.

4. Victoria now offers a rich diversity of native fishing experiences and anglers are in for exciting times as these fisheries mature over the next decade.

Acknowledgements

Recreational fishers are investing more than ever in recovering native fish populations. In this year's budget, the recreational fishing licence is contribution around \$2 million or 55% toward the cost of breeding (Snobs Creek) and stocking fish.



Fisheries have stocked more than 500,000 estuary perch in 14 lakes since 2012. This 4 kg specimen stocked ten years ago, shows the potential of these new fisheries.



Rocklands Reservoir has the potential to become one of Victoria's best stocked native fisheries.

Habitat, flows and stocking - The triple treat for native fish in Gunbower Creek

Louissa Rogers

Manager Environmental Water, North Central Catchment Management Authority

Anecdotes from the old newspaper archives dated in the mid to late 1800s, describe rivers and waterholes that were teeming with fish. Large (100 kg+) Murray cod were common and the elders in our communities talk about when they were children asking mum what fish she wanted for dinner and going to the nearest creek or river to get it.

We know that the Gunbower Creek and lower-Loddon River systems once supported 22 native fish species, however monitoring since the mid-2000s shows that only 13 of these species remain. Of these six are listed under state and federal legislation as threatened, including the Murray cod, silver perch and freshwater catfish, or “good eating fish”. The waterways within the Gunbower Creek and lower-Loddon River systems were once an interconnected complex of fast and slow flowing waterbodies. However, over the last 120+ years these streams (and many others across the Murray-Darling Basin) have been heavily modified to support the development of irrigated agriculture, rural towns and urban centres.

Dams were constructed to harvest water and store water when it rains over winter and spring, and release water in the warmer months when water is needed for pastures, orchards and crops. Weirs were constructed to divert water via gravity out onto the floodplain or to be pumped directly onto adjacent land.

Some waterways have been dredged to increase the volumes of water that can be delivered through them, in other streams land clearing and stock access cause erosion, which under constant summer flows have silted up deep pools. In the 1970s and 80s rivers were de-snagged to try to improve flood management.

All of these things have made it very tough to for our native fish to survive.

We cannot change things back to what they once were, and why would we want to? Our irrigated agricultural industry is critical to the national economy, and puts food on our tables. So what can we do to support our native fish to survive and thrive, in our working rivers?

Well we know that native fish primarily need three things to support native fish survival.

Habitat – Habitat includes snags, native water plants, deep pools, shallow backwaters, riffles, and also includes well vegetated riparian zones. Habitat is critical for the survival of native fish and provides food, shelter and resting places, substrate for eggs, warm temperature zones for larvae to survive, feed and grow. It also provides refuge areas for all fish during dry periods of low to no flow.

Connectivity: Fish need to be able to move throughout waterways and associated waterbodies (such as floodplain wetlands and billabongs) to respond to changes in conditions, access food and to complete life cycle processes, such as spawning. The construction of weirs and dams throughout the Murray-Darling Basin has created barriers throughout the system that obstruct fish migration.

Flow – It’s a no brainer that fish require flows, but they need flow at the right time, the right rate and the right place. Larvae and juvenile fish require slow stable flowing warm shallow water to access food and provide protection from predation. Flows in winter prevent juvenile fish that have spawned or were stocked from becoming food for adult fish in the winter pools by ensuring

access to edge habitat that provides food and protection. Rises in water levels in spring cue fish to migrate for spawning, high flows in late summer and autumn encourage juvenile fish to disperse, ensuring genetic viability throughout the system.

The North Central CMA has a plan of action for the Gunbower Creek and lower-Loddon system; a Native Fish Recovery Plan. The plan identifies key actions that will ensure that the three cornerstones of native fish survival are addressed. Together with our partners, and along with complementary activities such as stocking, we are constructing fish passage on weirs, reinstating snags, fencing and revegetating the river banks, exploring the recreation of deep pools, and managing flows.

Sounds simple enough? Except that the Gunbower Creek and Pyramid Creek (a major tributary to the lower-Loddon River) are major irrigation water carriers in the Torrumbarry Irrigation Area. These creeks became part of the irrigation system in 1923, with the construction of the Torrumbarry Weir. Since then they have been operated just like channels for the supply of water for irrigation and towns. In Victoria, a Statewide method (referred to as the FLOWS method) is used to establish ecological objectives and determine the environmental water requirements using the natural flows that would have occurred dams were not in place as a basis for setting these flows.

However, under the typical flows delivered for irrigation, water is delivered when there is irrigation demand from late spring to early autumn, and the creeks cease to flow during winter when the irrigation system is shut down. The challenge, in such highly regulated systems, is to deliver environmental flows without impacting on irrigation supply, which means we can't reinstate the natural flow regime.

Gunbower Creek:

In Gunbower Creek, the North Central CMA has used the scientific understanding of the Murray cod life history to plan and deliver flows. We have

targeted Murray cod, because our monitoring has shown a serious decline in Murray cod numbers, and most of the fish being recorded in our surveys were older, which indicates that young fish that either naturally spawned or were stocked in the previous spring were not surviving.

The life cycle of the Murray cod has the following vitally important flows - winter flows, spring rise, stable flows, engaging the littoral zone and ramp down.

Of these, the winter flow component was the easiest to achieve as we are the only player in the system during the off-irrigation season, so can achieve this target without impacting on other water users. Irrigation demand and supply generally achieves the spring rise, littoral zone and ramp down flow components.

The stable flow component is the most challenging. Review of the flow data at Cohuna Weir showed that irrigation demand creates very rapid and extreme fluctuations such as a change in flow by over 600 ML/d within a two hour period. To combat this, we set our target environmental flow rate quite high, well above the usual irrigation demand, so our flow operators had the flexibility needed to be able to achieve the stable flows. This enabled us to smooth the hydrograph and reduce sub-daily variation.

While this is not what traditional flows studies have recommended - FLOWS studies often suggest that during summer flows in streams should be very low as would have occurred naturally to provide shallow, relatively still warm water for larvae and juvenile fish to feed and grow – over the last four years since delivering flows to support the Murray cod life cycle, we have seen young fish, of each year age class, being recorded each year in our surveys. This is good news for the fish, and good news for the anglers.

Pyramid Creek:

In Pyramid Creek a similar approach was used to provide flows to stimulate fish movement,

particularly golden and silver perch, through the lower Loddon River and the Pyramid Creek system.

Pyramid Creek was dredged in the 1960s to create a greater channel capacity, destroying the creek bed variability by turning the creek into a canal. Science has told us that Pyramid Creek is an important pathway between the Loddon River system and the Gunbower Creek system, with the high value wetland habitat Kow Swamp, an important environmental asset connecting these two systems, which is potentially great nursery habitat for native fish such as perch. Under the Native Fish Recovery Plan, using a mix of recreational fishing grants and Riparian Action Plan funding, we have reinstated around 36 snag complexes into Pyramid Creek to provide resting points for fish moving almost 70 km through the creek between the Loddon River and Kow Swamp. Flows in Pyramid Creek meet the Loddon River at Kerang Weir, where water for irrigation is diverted to the Kerang Wetlands, west of the Loddon River. Other than a passing flow over Kerang Weir, the only source of water from Kerang to the Murray River is water for the environment.

Our flow planning for Pyramid Creek focusses on three flow components. As with Gunbower Creek we will reinstate the winter base flow, this will ensure that the snag complexes remain engaged and any fish in the system are not stranded. The other

flows we have targeted are two high flow events, one in autumn and one in spring, to stimulate fish movement through the fishways on Kerang Weir and Box Creek regulator into Kow Swamp.

We have delivered two of these high flows to date. To ensure we do not compromise the needs of irrigators we delivered environmental water on top of the irrigation water requirement to Kerang Weir. To supplement the water that was diverted for irrigation to the Kerang Lakes, water was also delivered to meet the flow at Kerang Weir, from the Loddon River. Combining these flows provided the balance between consumptive water in Pyramid Creek, and the flow required downstream of Kerang Weir to encourage fish movement.

The resulting flow rate at Kerang Weir stimulated the movement of large and small bodied native fish species through the fishway at Kerang Weir – some moved upstream into the Loddon River, and others through Pyramid Creek and into Kow Swamp. We need a few more years of data to understand the benefits that this movement is having to the broader fish population, but we have found that some very large Murray cod have decided that our new snags are a great place to live. The evidence that we are collecting from monitoring of these flows shows that we can have it all; healthy productive irrigation communities, and a world class Murray cod trophy fishery.



Angler's putting back - Our licence fees at work

Michael Burgess

Executive Officer, Victorian Recreational Fishing Peak Body

Creating a world-class Murray cod fishery in Victoria takes long-term planning and the necessary resources to reach this goal. After 15 years of work, Victorian fishers are hailing the resurgence of our cod fisheries around Northern Victoria, including the Lake Eildon trophy fishery.

Victorian fishers have made a direct financial contribution to our Murray cod fishery through our licence fees. Every time we take out a Recreational Fishing Licence (RFL), our money is held in the RFL Fishing Trust Account so that these funds can be invested directly to improve recreational fishing in Victoria.

Annually, RFL funds are redirected towards funding the Recreational Fishing Grants Program (RFGP), a contribution to the cost of fisheries enforcement and education, supporting fish stocking, sales commission to licence agents, funding VRFish and Fishcare Victoria, administration of the RFL and a contribution to Target One Million. A Recreational Fishing Grants Working Group (RFGWG) is appointed by the Minister Responsible for Fisheries to provide recommendations on funding for small, large and commissioned RFGP projects.

Since 2005/06, approximately \$2.3 million of RFL funds have been invested in Murray cod management and strategic stocking projects. This total includes \$800,000 to stock Lake Eildon with an additional 1 million Murray cod fingerlings and \$799,500 to a Building Northern Native Fisheries project. RFL funds have contributed \$4.2 million to the partial cost of the annual salmonoid and native fish stocking program since 2012/13 which has delivered 3,878,322 million cod fingerlings.

Our licence fees funded research into assessing the slot size limit as an alternative management

tool to optimise our Murray cod fishery. This change has led to more large cod in the fish population to that boost natural recruitment and stock recovery, while fishers benefit from a vibrant large cod catch and release fishery and aspirations to become part of the 'metre-plus club'.

Stock enhancement has been supported by habitat restoration and enhancement in our waterways where Murray cod are present. Since 2005/06, a further \$1.71 million of RFL funds have been invested into 19 habitat projects which are assessed as directly benefiting Murray cod in some way. Investing RFL funds into fish habitat continues to be the most important priority for recreational fishers.

Analysing how Victorian recreational fishers have directed contributed to our Murray cod fishery demonstrates the importance of having a strategic approach to improving our fisheries and that fishers are enabling works to occur on a continuous basis through direct financial contributions. RFL funds are also leveraging additional financial contributions and in-kind support from other organisations and funding sources.



Native fish report card program

John Douglas

Fishery Manager, Victorian Fisheries Authority

We value our freshwater native recreational fish including; Murray cod, golden perch and others but, despite occasional fish population surveys and angler feedback, we have no long-term and objective information about how they are performing. Fish population surveys tell us about fish population abundance, evidence of recent breeding and or, stocking contribution, presence of multiple years classes, fish movement patterns and can be used to inform an overall fish population health rating. This information has been collected for our iconic trout streams (Wild Trout Fishery Management Program) but to date not for our key native fisheries.

This is all about to change. For the first time, the population health of our most important native river fisheries across ten catchments will be surveyed over the next 3 years. This Native Fish Report card program is a partnership between the Department

of Environment, Water, Land and Planning (DELWP), the Victorian Fisheries Authority and Recreational Fishing Licence holders (through RFL funding). The program will provide \$600,000 over 3 years.

Because we can't monitor all of our 270+ freshwater fisheries, we've selected 10 of our most popular and important (priority threatened species) native recreational fisheries – these are called reference rivers. We focussed on rivers rather than lakes and impoundments because most of our native fisheries breed in rivers and not lakes. Rivers were selected in collaboration with DELWP, Catchment Management Authorities and expert recreational fisher input. At each reference river, up to 10 survey sites will be surveyed each year using electro-fishing methods. The performance of our lakes and impoundments fisheries will be separately surveyed using angler catch and effort data collection – refer My Catch and Diary Angler program.



Our bass stocking program through Gippsland Rivers is showing promising results for anglers.

CMA region	Priority River	Recreational species	Priority threatened species
Corangamite CMA	Gellibrand River	River blackfish	Australian grayling
East Gippsland CMA	Mitchell River	Australian bass	Australian grayling
Glenelg Hopkins CMA	Glenelg River	Estuary perch	Nil
Goulburn Broken CMA	Lower Goulburn River	Murray cod, Golden perch	Trout cod, Silver perch
Mallee CMA	Lindsay River/Mullaroo Creek	Golden perch, Murray cod	Silver perch
Melbourne Water	Yarra River	Murray cod, Macquarie perch	Australian grayling
North Central CMA	Gunbower Creek	Murray cod, Golden perch	Trout cod, Silver perch
North East CMA	Ovens River	Murray cod, Golden perch	Trout cod, Macquarie perch
West Gippsland CMA	Thomson River (including Macalister River downstream Lake Glenmaggie)	Australian bass	Australian grayling
Wimmera CMA	Wimmera River	Freshwater catfish, Golden perch	Nil

Here are the list of priority native river fisheries and target species to be surveyed over the next 3 years.



Report card surveys tell us trout cod are doing well in the Ovens and parts of the Goulburn River

Survey highlights from the first year

Mitchell River

- Australian Bass captured at 10 of 11 sites surveyed.
- Legal size Australian bass were recorded from six sites.
- Large numbers of small Australian bass (<190 mm Total Length) show stockings are working.

Thomson / Macalister Rivers

- Australian bass were collected at 13 sites, with legal size fish captured at 8 sites.
- More than 30 small Australian bass (< 125 mm) were collected from two sites show recent stockings have been successful.

Yarra River

- Low numbers of Murray cod were captured with only one legal size fish captured.
- Macquarie perch abundances were also lower than historical surveys, with no legal size Macquarie perch captured.

Gellibrand River

- Low numbers of river blackfish captured from the Gellibrand River.
- All fish captured were adult fish, indicate lack of spawning and recruitment.
- Tributaries contained more fish.

Glenelg River

- Estuary perch were collected from eight sites.
- Most legal size fish found closer to the estuary.
- Also collected large Australian Bass from Casterton upstream towards Rocklands reservoir.

Wimmera River

- Golden perch captured from every site surveyed (23 were legal size)
- Low numbers of silver perch and Freshwater catfish were detected.

Lindsay River/Mullaroo Creek

- Golden perch collected from all 13 sites surveyed. 77 legal Golden perch collected
- Low numbers of Silver perch were detected.
- Only one Murray cod detected.

Gunbower Creek

- Golden perch captured from seven of the 11 sites surveyed - 28 (93%) were legal size.
- Murray cod present in good numbers at most sites.
- Six oversize Murray cod captured, including four > 1m.
- Silver perch were collected from 7 sites.
- Trout cod were captured from 3 sites.

Goulburn River

- Murray cod collected at all 11 sites surveyed with evidence of Murray cod recruitment.
- Legal size fish and oversize fish present.
- 51 legal size golden perch collected from 9 sites.
- Trout cod captured at five sites, higher abundances downstream Lake Nagambie
- Silver perch captured at seven sites, although in low abundances.

Ovens River

- Murray cod collected at all 12 sites surveyed. All size ranges collected with evidence of recruitment, legal size and oversize fish collected. 18 legal size fish collected
- Trout cod present at 9 of 12 sites surveyed - good size distribution
- Macquarie perch going well - collected at six sites.



Silver perch were found in the Gunbower Creek and to a lesser extent in the Goulburn River.

Presenting the results

Survey information will not only be used for fisheries management purposes, it will also help anglers decide where they should go to target their preferred species. To get this information out to the broader public, the information will be presented on the web using an on-line, user friendly mapping format. At the click of a button, the latest native fish population data will be available including size of fish, relative abundance, key species and general river reaches. This data base web product is currently being developed and is expected to roll out in 2018.



Based on population surveys, our best Murray cod fishery is the Ovens River

Better fish habitat in lakes - lessons from overseas

Dr Andrew Norris

Senior Fisheries Biologist, Queensland Department of Agriculture and Fisheries

The availability of habitat is essential to fish for foraging, shelter and reproduction. In many dams, vegetation and timber are cleared prior to initial flooding, leaving limited structural complexity for fish. The quality of remaining habitat also declines greatly as dams age and can lead to poor fisheries and poor angling. Habitat enhancement has the potential to slow or reverse this trend and improve the fishing.

Habitat enhancement in impoundments has been widely practised around the world to improve fisheries by increasing productivity, carrying capacity, reproduction, survival and growth. Installed habitat structures can also significantly improve angling by attracting fish to locations that anglers can more easily access or target, leading to larger and more reliable catches. This approach is undertaken by almost all state fisheries agencies in the USA.

A wide variety of habitat enhancement methods have been employed to improve habitat complexity in USA reservoirs and lakes. Habitat enhancement have been used to aggregate fish, provide more food, increase growth rates, improve reproductive success, improve juvenile survival and recruitment (wild and stocked), and provide protection from predators.

“Habitat enhancement has made it a lot easier for tourists to come and fish and increased the likelihood of them catching something.” Stacey King, professional tournament angler and guide.

Historically the materials used for fish attracting structures have largely been those that are convenient, economic and readily available.

As knowledge in the field grows, more specialist fish attracting structures are being created to service specific needs of different species and size classes. Generally a combination of fish attracting structure types is utilized to provide greater diversity of habitats for a wide range of species. Many of the techniques are suitable for construction and deployment by community groups such as angling clubs, and can be cost-effectively implemented.

This presentation discussed some of the techniques that have been used successfully in the USA and how they could be applied in Australian to improve dam fisheries.



Fish attracting structures should work for our native species as well!



Typical poor fish habitat in an old dam



Much better fish habitat in a new dam



A synthetic Georgian cube used to attract fish



A brush pile which has attracted a variety of fish of different sizes and species



Care for cod campaign launch

Anthony Forster

Manager Freshwater Fisheries, Victorian Fisheries Authority

In 2015, the Victorian Fisheries Authority (previously, Fisheries Victoria) introduced new fishery regulations for Murray cod including; a minimum size limit of 55 cm and a maximum size limit of 75 cm. Based on innovative science, these regulations were supported by a reference group of leading Murray cod recreational fishers. The reference group's support however, was conditional on the need to encourage better Murray cod handling practices among anglers. The proposition was simple, if regulations result in more anglers catching and releasing large Murray cod, let's make sure the bigger breeding fish are not compromised by catch and release methods.

At last year's inaugural Murray Codference, Dr Paul Hardy Smith gave a presentation that highlighted, how big Murray cod are particularly vulnerable to poor recreational fish handling practices. This presentation was supported by a literature review of fish handling practices that revealed some leading international and local research on fish physiology and handling practices.

At that Codference, the VFA agreed to develop a campaign to raise awareness and help fishers understand the importance of handling big Murray cod.

The four point plan

Here are the key messages, the Victorian Fisheries Authority will use as part of its campaign to maximise the chance of anglers successfully releasing a big Murray cod;

1. Be prepared.

To land a big Murray cod, remove hooks, photograph, revive, and release it successfully, requires careful planning and the right gear. Good organisation will ensure a quick release, reduce



Angler attitudes and respect for Murray cod have changed a lot.

stress on fish and maximise the chance of the fish surviving. Here are some simple tips for anglers:

- Use a soft knotless or rubber landing net
- Have sturdy gloves close and on standby - to protect hands and grip the lower jaw.
- Avoid lip grippers that bruise or damage fish mouth & jaws.
- Long nosed pliers should be on standby to remove hooks.
- Make sure fish length measures are ready to go and wetted down.
- Your camera should be ready and handy.

2. Reduce air time

A fish can't breathe out of water so, after an exhausting fight, they need water and time to recover.

- If possible, keep your cod in the water at all times. If safe to do so, get in the water with your prized fish for a great action photo.
- If you decide to lift the fish out of the water, do it gently and quickly - aim for 30 seconds or less air exposure.

3. Gently does it

- If lifting a cod, support the whole fish and don't "hang" the fish vertically - that can damage the spine and gill structure.
- Protect the skin - don't place the fish on dry, sharp or hot surfaces.
- Revive the fish slowly to allow water flow over the gills - don't move the fish forward and backwards in the water.

4. Use the right gear

- Use appropriate gear. A big cod on light line will be exhausted and may not recover. Heavier line reduces the time to land the fish.
- When fishing with bait, use large circle hooks (and tight line) to reduce the chance of deep hooking.



If the waters deep and cold to get in with your fish, and you need that trophy fish photo, it's important to be prepared, support the fish and keep it under 30 seconds.



Where ever possible, keep your Murray cod in the water to reduce stress and maximise its chances of survival on release.

Getting the key messages out

These key messages will be widely promoted to anglers as part of a campaign jointly promoted by; Victorian Fisheries Authority, VRFish and the tackle industry. Here are some of the key elements of the communication plan:

Video:

- 3 - 5 minute fishing demonstration video on better handling practices via social media.

Poster:

- Large format (A3) poster and A4 flyers with key messages sent to tackle stores, clubs & events

Boat / car stickers:

- Simplified key messages sent to tackle stores, clubs and events.

Media release:

- Circulate to media outlets (interview follow ups)

Webpage:

- Victorian Fisheries Authority Webpage

Fish e-fax newsletter

- Circulation to 26,000 angler email subscribers

Magazine adds:

- Print and internet magazine advertisements

Promoting cod friendly gear:

Another way to get better Murray cod handling messages out to anglers is to promote fishing gear that reduces the risk of damage to fish. The Victorian Fisheries Authority is in discussion with a number of tackle stores about an 'accreditation tag' that could be used to promote cod friendly tackle such as: circle hooks, large rubber knotless nets, long-nosed pliers, gloves, etc.



Circle hooks are good example of "cod friendly gear" that can reduce the chances of deep hooking damage



Gloves are a great way to avoid injury to yourself and jaw damage to a thrashing Murray cod

National Carp Control Plan update and the Victorian Perspective

Craig Ingram

Target One Million Coordinator, Victorian Fisheries Authority

Carp is a major aquatic pest species in Victoria. The species has been a blight on aquatic systems and anglers for far too many years. Unfortunately, carp are so ingrained in the landscape that many anglers do not know what it is like to have lakes and streams with low carp number and cannot imagine what a low carp fishery looks like.

Despite considerable effort on a number of fronts, carp control has been difficult as the fish can produce millions of fry when environmental conditions are suitable and the fish are long lived, so they don't have to spawn each year but when they do, there are lots of young. Conventional control methods have been limited.

Over the past decades governments and waterway managers have been active in improving the health of our rivers and native fish populations including a number of measures to manage or remove carp, yet carp are still the dominant species in many of the states waterways. In May 2016, the Commonwealth Government announced \$15 million over 2.5 years for the development of a National Carp Control Plan (NCCP).

The Victorian Government understands that effective control carp has potential to provide strong environmental benefits for Victorian waterways and is taking a key role in supporting the development of the NCCP.

The NCCP will explore the release of a carp herpes virus as a biological control agent to manage carp in Australian waterways. The Victorian Government recognises that biological control offers the best potential to control or significantly reduce the carp population.

There are, however, a number of potential risks that must first be managed before Victoria can support the release of the virus. Risks may include periods of poor water quality resulting from the die-off of large numbers of carp that may impact on Victorian communities and environmental values.

The NCCP team is now embarking on a large program of scientific research and a series of community engagement forums across carp affected areas in order to:

- address knowledge gaps, and better understand and manage risks to support the potential release of the carp virus, subsequent clean-up and recovery of native fish and ecosystems;
- plan for an integrated approach to control carp in Australia's waterways;
- build community awareness for the proposal to release the carp virus, and identify and address stakeholders' and communities' concerns;
- develop detailed strategies for release of the carp virus and subsequent clean-up; and
- support national coordination on all elements of the NCCP's development.

Further information on the NCCP can be found at www.carp.gov.au



NATIONAL CARP CONTROL PLAN
RESTORING NATIVE BIODIVERSITY

The Ovens River, from rags to riches

Robbie Alexander

Fishing journalist and expert recreational angler

The Ovens River system was once a magnificent upland waterway rich with native fish. From it's junction with the Murray River at Bundalong all the way up to Harrietville, the Ovens River was teeming with native fish.

The river was rich with Murray cod, trout cod, an odd yellowbelly and a few Macquarie perch as well as other smaller, lesser recognised native fish.

During the early 1900's the Ovens River system suffered from enormous fishing pressure from recreational and commercial anglers, as well as recreational anglers that operated the same way as commercial anglers.

By the time the great depression hit during the 1920's, every man and his dog was taking fish from the river to feed their family, to the point that fish numbers declined dramatically.

After the depression, the financial situation had improved but those old fishing methods and mentalities remained in place for decades. Even right up into the early 1990s set lines, drum nets, gill nets etc... were employed to try and ensure that we removed every last fish!

By the 1980's when I was a kid, the Ovens River was a carp and redfin infested waterway with murky water, damaged fish habitat and very few native fish. At that time, we were lucky to catch 1 or 2 Murray cod per year. Things were really dire.

The early 1990's brought with them some dramatic changes to fisheries management, fisheries research, environmental care and angler mentality.

An initial stocking of Murray cod, combined with the reintroduction of a size limit was all that was required to see this species once again infiltrate the river.

Throughout the early 1990's yellowbelly were stocked into the river en masse. With all of these Murray cod and yellowbelly, the redfin population became almost obsolete almost overnight.

After the yellowbelly stocking discontinued in the mid 1990's, Victorian fisheries stocked thousands of the endangered trout cod into the Ovens River to try and re-establish the species after it had become totally extinct from the Ovens River system in the early 1980's.

This was very successful, and we now have self sustaining populations of both Murray cod and trout cod in the Ovens River which are quite easy to catch, particularly the small ones.

These days, anybody can catch a native fish in the Ovens River and now with the focus being on habitat restoration and the re-introduction of Macquarie perch into the Ovens River system things have never looked better. The Ovens River has gone from riches to rags, and now back to riches once again.



Cod culture

John Cahill

Recreational angler and fishing author

John Cahill looks at the changes he has seen in cod fishing over the last 40 years. Growing up in a family that had the Goulburn and Murray River as their playground, Murray cod was a big part of life, with spare time a mix of cod, Murray River cray or duck shooting, depending on the season, no matter what it was, it was inevitably stuffed into a hessian bag. His adolescent memories are filled with shotguns, camp fires, flat bottom punts and red gum enclosed green rivers strewn with dead timber.

Fast forwarding 20 odd years and the cod fishing scene has transitioned. The focus has gone

from drowning baits and killing fish to getting casting big surface lures in the quest to have a massive green fish crunch on a lure in an explosion of white water; cod are legit cool now and are now afforded the greatest respect.

A new generation has sprung up that loves the same things about the river as the old guard but their focus has changed to putting in the hard, sleep deprived yards to get that bite from a big greenback, take a photo and release a trophy fish in good shape for the next guy, that's the new cod culture.



Luring lessons hard earned

Marc Ainsworth

Communications Manager – Victorian Fisheries Authority, Former Editor
Victorian Fishing Monthly magazine, Daiwa Pro Angler

Casting lures for native fish such as Murray cod and golden perch continues to increase in popularity. It's not the easiest way to catch these natives, but it is very rewarding and there's always the chance of a giant goodoo over the magic metre.

For more than 20 years I've fished for natives hard and learned lots of lessons along the way. No gurus sharing secrets. Just doing the yards. With any luck, a few of those hard earned lessons shared today will save you fishless days on your favourite water and accelerate your learning curve. These are the things I wished someone had told me at 17.

Habitat

Natives love snags. That's not news! But there's a skill to reading them well that really increases catch rates. One trick is to look at a bank that's high and dry to analyse how timber has fallen, its direction of fall, abundance and position. Banks on the windward end of long straights collect more timber than most. Find them and you'll find more snags and more fish. Similarly, small seemingly innocuous little sticks poking above the water can actually be connected to big root balls and thick trunks that provide shelter, security and shade for cod and goldens. Cast at them! Use your lure as an explorer of snags because if you're sitting on top of its saying 'wow', then you're too close and they already know you're there!

Lastly, understand that most lakes are managed waterways. Their level fluctuates over the course of an irrigation season. Snags that were perfect to fish one month, can be high and dry the next. A circuit of snags at Eildon in May can be vastly different to a circuit of snags in December at higher lake levels after spring melt.

Bite windows

It's taken me longer than it should have to realise that natives are on lots of the snags I fish, but just aren't interested when I happen to be there. Returning at another time, possibly in low light, can make all the difference. So have the patience to stick it out. Keep casting. Have the confidence to know that over a two day trip there will be a bite window. And when they do turn on, make the most of it. Postpone your lunch, limit the downtime. The bite might last for an hour or it might last all afternoon. You just never know!

Slow is golden

Slowing down your retrieve for golden perch is a key ingredient for more success, more often. Whether it's a lipless crankbait cast into the head of a submerged tree in 70ft or a hard-body cast past a stump in 4ft, consciously slowing down the retrieve can make all the difference.

Lure choices

Spinnerbaits, diving hard-bodies, lipless crankbaits or surface lures. So many options! Choice is now your enemy. It can paralyse you. My advice? Choose a section of water to fish. Choose a lure to suit (you know that stuff already) and stick with it. Avoid the trap of tying on 15 lures in a day and jumping from one strategy to the next. You'll only scratch the surface of any one of them. Some of our most successful days have come from grinding it out with a method and lure we trust, persisting to a bite window, then cashing in on several fish in an hour.

Good luck out there. Tight lines!



The rewards are worth it, but analyse what you're doing when you find fish like this.



Hotel Goodoo. If you play the numbers and target solid timber, you'll find more cod than most people



Big fish can come at any time. At 103 cm, this is my best Eildon cod. It took a liking to fairly small offering; a single bladed ½ oz spinnerbait.



Imagine another 15 ft of water in the lake and you'd barely see this snag, or maybe just tell-tale signs of small diameter roots poking above the water.



Slow retrieves for goldens can be the deal-breaker. Invest in a low ratio reel if you can't slow down enough yourself.

Target One Million
More Victorians fishing, more often

