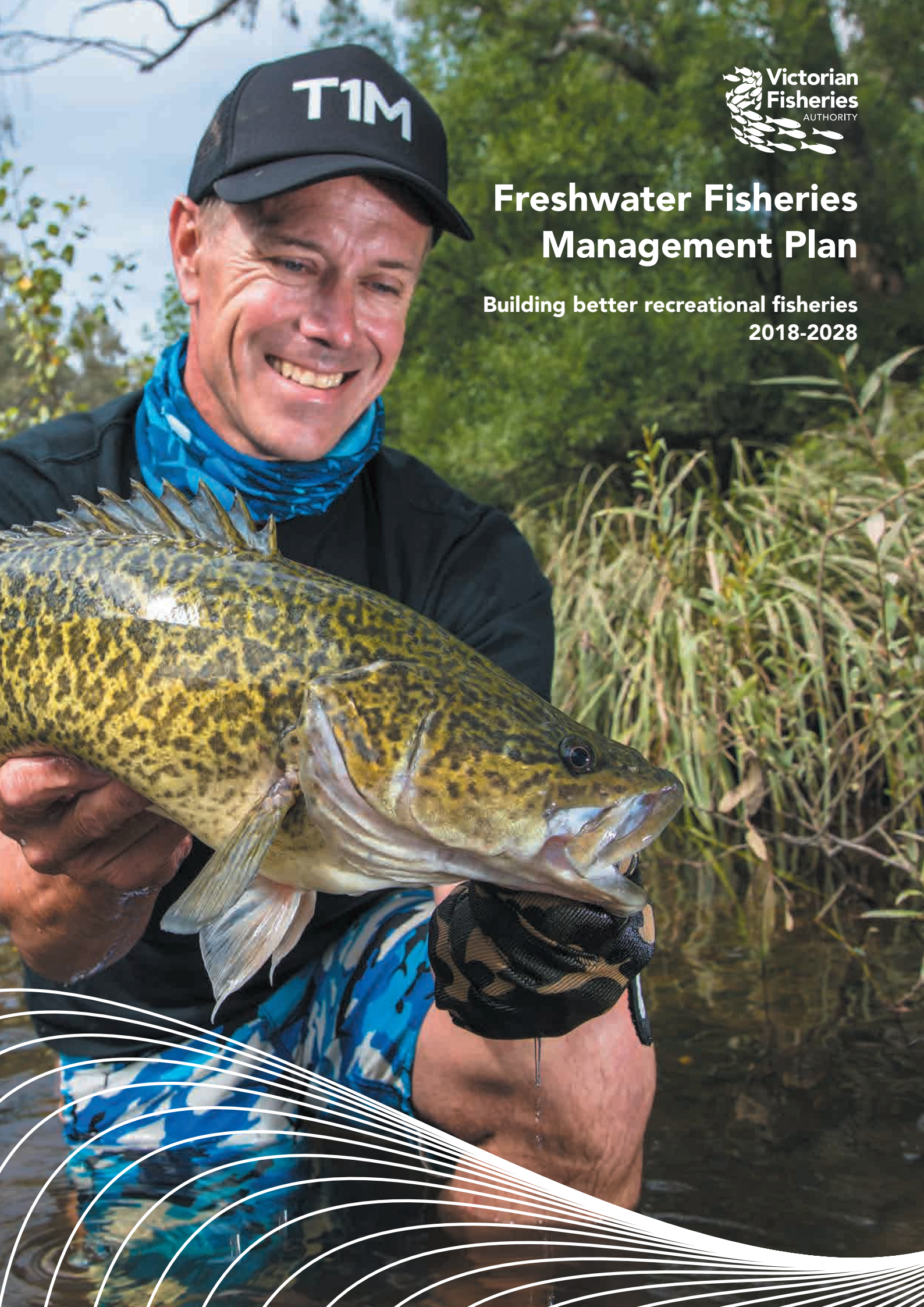




# Freshwater Fisheries Management Plan

Building better recreational fisheries  
2018-2028



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# Minister's foreword

I am delighted to declare this management plan for Victoria's thriving freshwater recreational fishery.

Over the last four years, the State Government has greatly improved fishing by implementing its Target One Million Plan to get more people fishing, more often. Some highlights include:

- ✓ Stocked 16 million fish over 4 years in 200 + waterways,
- ✓ Saved Lake Toolondo,
- ✓ Established a world-first barramundi fishery at Hazelwood Pondage,
- ✓ Revived a trophy salmon fishery in the crater lakes,
- ✓ Created an exciting new native fishery at Rocklands Reservoir,
- ✓ Extended the Wild Trout Fishery Management Program,
- ✓ Expanded Bass stocking in Gippsland,
- ✓ Developed a dozen new stocked estuary perch fisheries,
- ✓ Improved trout fishing regulations,
- ✓ Established new trout cod fisheries,
- ✓ Improved boating access to Blue Rock Lake,
- ✓ Rolled out native fish health report card program for 12 species across 10 catchments,
- ✓ Attracted 6,000 children and families to learn about fishing at 20 fishing events,
- ✓ More than 50 angler access and recreational fishing facility improvements.

This plan was prepared through a partnership involving the VFA, VRFish, Native Fish Australia, Australian Trout Foundation, the Department of Environment, Water, Land and Planning and Catchment Management Authorities and the Federation of Victorian Traditional Owner Corporations. I congratulate all those who were involved.

I'm confident this state-wide plan will bring people together to find common ground, leverage investment and create even more exciting fishing opportunities in the future.



**The Hon. Jaala Pulford MP**

Minister for Agriculture  
Minister for Regional Development



# Aboriginal acknowledgement

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

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, Traditional Owners and their communities, and value the ongoing contribution of Aboriginal people to Victorian life, through their daily work, their application of Aboriginal knowledge and practice, and at key events; we recognise how this enriches us all.

We recognise that 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 Victorian Traditional Owner groups, related to cultural and natural heritage, that are paramount in our responsibilities in managing Victoria's resources in partnership with Traditional Owners.



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# Executive summary



This Freshwater Fisheries Management Plan provides the overarching, strategic direction for managing freshwater recreational fisheries in Victoria.

Our freshwater environments are unique and wonderfully diverse. They are home to a range of freshwater fish, crayfish, molluscs and other aquatic species. Some of the most popular recreational fishing species are Murray cod, golden perch, brown trout, rainbow trout and redfin perch, and the Goulburn, Ovens and Howqua rivers, and lakes Eildon, Eppalock and Hume are a few of the favourite recreational fishing destinations.

Our vision for the Freshwater Fisheries Management Plan (the Plan) is: *"In partnership with relevant agencies and the community, we will continue to build better recreational fisheries by integrating fish, water and land management. This will secure the resource for current and future generations, share the resource among the community, and grow social, economic and cultural values".*

The Plan focuses on sustainably managing freshwater recreational fisheries in rivers and streams, lakes and impoundments, at a statewide level. Fifteen of Victoria's most popular freshwater recreational species are considered: Murray cod, trout cod, golden perch, Macquarie perch, silver perch, river blackfish, freshwater catfish, Australian bass, estuary perch, brown trout, rainbow trout, Chinook salmon, redfin perch, Murray spiny crayfish and common yabby.

To achieve the vision, the Freshwater Fisheries Management Plan has five main objectives:

- government, recreational fishers and the broader community working together to improve fish habitat and recreational fisheries
- recreational fishers, scientists and resource managers using the best available information to manage fisheries







- Victorian Traditional Owners and their communities being active partners in recreational fisheries management
- recreational fishers having improved fishing opportunities and experiences
- recreational fishers adopting and promoting responsible fishing practices.

Priorities are identified under each objective that set out the strategic direction for implementing the Plan. There are 20 priorities in total. By Year Five of the Plan, fish populations and catch-per-unit-effort data will be used to develop a freshwater fisheries harvest strategy.

A working group of key investment partners and recreational fishing organisations will be established to help implement the Plan. By adopting the Plan as a shared vision, we will leverage investment, maximise fisheries outcomes and manage resources in an efficient and effective manner. The working group will prepare an implementation plan with a focus on priorities that achieve combined benefits for fish, fish habitat and recreational fishing, and realise broader community, social, environmental and economic benefits. Our fisheries management approach will be adaptable and responsive to changing conditions and will rely on the best available evidence and knowledge.

The Plan is intended for Victorian government agencies, waterway managers, water managers, land managers, recreational fishers, Traditional Owners, and other community members involved in recreational fishing; fish, water and land management; or activities that may affect fisheries resources.

The Victorian Fisheries Authority prepared this Plan in consultation with a stakeholder- and expert-based Steering Committee, comprising representatives from VRFish, Native Fish Australia, the Australian Trout Foundation, the Federation of Victorian Traditional Owner Corporations, the Department of Environment, Land, Water and Planning, and catchment management authorities. In finalising this Plan, we acknowledge the valuable feedback in response to our 60-day public consultation period.



# 1. Victoria's freshwater recreational fisheries



## 1.1 Freshwater environments

Victoria covers an area of more than 200,000 square kilometres and features 29 river basins divided into 10 waterway management regions. Our freshwater environments are unique and wonderfully diverse. Cool, clear, swift-flowing alpine streams transform into meandering lowland rivers. A rich array of natural wetlands and constructed waters are dotted throughout the landscape. Victoria's freshwater resources are in great demand and are widely used for agriculture, industry, and domestic water supply. People enjoy our waterways for fishing, swimming, boating, kayaking and other recreational activities. Our freshwater environments provide critical habitat for a wide variety of unique aquatic species.



## 1.2 Freshwater fish

Victoria's freshwater environments are home to a range of freshwater fish, crayfish, molluscs and other aquatic species. Over 60 species of fish are found in Victoria's freshwater environments. They range in size from the large, iconic Murray cod (*Maccullochella peelii*) (over 1 metre long) to the smallest of galaxiids, some of which are less than 4 centimetres long. All aquatic species are important components of Victoria's biodiversity and environmental health.

Our large-bodied native and introduced freshwater fish species are popular among recreational fishers. Many of our popular native recreational fishing species are listed as threatened or endangered species under Commonwealth or state legislation, including Murray cod, trout cod (*Maccullochella macquariensis*), silver perch (*Bidyanus bidyanus*), Macquarie perch (*Macquaria australasica*), freshwater catfish (*Tandanus tandanus*), golden perch (*Macquaria ambigua*) and Murray spiny crayfish (*Euastacus armatus*).

Our most threatened native fish cannot be taken by recreational fishers, or have strict bag and size limits in place. A full list of threatened freshwater fish can be found in Appendix 1. Introduced fish species, including brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), Chinook salmon (*Oncorhynchus tshawytscha*) and redfin perch (*Perca fluviatilis*), are also among our most popular recreational fishing species (Appendix 2).



### 1.3 Recreational fishing

For many Victorians, recreational fishing is a popular pastime and provides a great social experience with family and friends. A study in 2013–2014 estimated that around 830,000 Victorians participate in recreational fishing each year, of which more than 40 per cent fish in inland waterways. As most freshwater recreational fishing takes place in regional Victoria, recreational fishing makes an important social and economic contribution to our rural towns and regions. Based on previous surveys, the most popular recreational fishing destinations are the Goulburn, Ovens and Howqua rivers, and lakes Eildon, Eppalock and Hume. Recreational fishing provides a range of public health and wellbeing benefits, including physical activity, socialisation and a source of sustenance; it improves mental health, reduces stress and gets people outdoors. It is an activity that can be enjoyed by families, children, adults and senior citizens, including people of all abilities. The diverse nature of Victoria's freshwater environments and fish populations offers unique recreational fishing experiences for people to enjoy all year round.





## 1.4 Commercial fishing

Inland commercial net fishing in northern waters was banned in 2002. Commercial harvesting of eels using fyke nets occurs south of the Great Dividing Range in estuaries, rivers, wetlands and lakes. Victoria's eel fishery includes wild-catch and stock-enhanced (eels stocked and ongrown in lakes) sectors. Commercial eel fishing takes place in some of our most iconic recreational fishing waters. The commercial eel fishery operates under strict conditions, on access licences and permits authorised under the state *Fisheries Act 1995* (Vic.), and in accordance with the Victorian Eel Fishery Management Plan (2017).

Eight commercial bait-fishing licence holders operate in inland waters, enabling the collection and sale of yabbies and shrimp from private and public inland waters using yabby pots, shrimp nets and haul nets. Recreational fishers often source bait from these operations.

There are also several noxious aquatic species permits issued under the Fisheries Act that enable commercial fishers to harvest populations of European carp under strict conditions.







## 1.5 Our modified waterways

The condition of Victorian freshwater fish populations has been profoundly influenced by the fish, water and land management practices of the last 200 years. As a result, our waterways have been highly modified and now look and perform differently to how they did before European settlement. Many of our rivers have been de-snagged, straightened, diverted, drained or dammed. Based on recent assessments, around 23 per cent of Victoria's rivers (by length) are described as in either good or excellent condition. Our rivers and streams in the east and alpine reaches of Victoria are generally in better condition than those in the west.

Fish populations and fishing practices have changed too. Historically, native fish populations had broader distributions and greater abundances, and commercial and recreational fishing exploitation was high. Many fish species [such as redfin perch, trout, carp (*Cyprinus carpio*) and eastern gambusia (*Gambusia holbrooki*)] were introduced into Victoria from other countries, and they compete with and predate on native species. Trout and redfin perch are now among our most popular freshwater recreational fish species, and they make a strong social and economic contribution to regional Victoria.

The compounding pressures of modified landscapes, urbanisation, degraded fish habitats, introduced species and documented overfishing have caused native fish populations to dramatically decline in abundance and distribution, even to the extent of some localised extinctions. In 2003, native fish populations in the Murray–Darling Basin were estimated to be at about 10 per cent of their pre-European settlement levels. Over the last few decades, considerable progress in restoring fish habitat has been made by management agencies for fish, water and land, and by recreational fishers. These actions, combined with fish stocking, fishing regulations and changing recreational fisher behaviour, are helping to recover fish populations and improve recreational fishing outcomes.



## 1.6 Key threats to freshwater fisheries in Victoria

Victoria's freshwater fisheries face a range of challenges. Many key threats stem from our modified waterways and fisheries, and there are emerging impacts from climate change and population growth. Some of the key threats to freshwater fisheries include:

### Altered water flows

Regulation of most of Victoria's waterways has altered the natural flow regimes and greatly affected fish populations. Water storage, extraction and flow regulation designed to supply water for agriculture, industry and domestic water supply has impacted native fish breeding, movement and survival. In some waterways that supply large irrigated areas, natural seasonal flow regimes have been reversed, generating high flows in summer and low flows in winter.

### Thermal pollution

Many of our large water storages are designed so that they release cold water from the bottom of their weir structures. While these structures support socially and economically important tailrace salmonid fisheries, lower downstream river temperatures reduce primary productivity and can impact native fish breeding. High irrigation flows in spring and summer compound this problem.

### Barriers to fish passage

Thousands of artificial structures, such as dams, weirs, channels and culverts, have been historically installed on rivers throughout Victoria. These structures prevent the passage of fish upstream and downstream, and between rivers and floodplains. Many native fish rely on migration at different stages of their life cycles to enable breeding, recolonisation, and access to food and shelter. In some instances, barriers have purposely been installed on small headwater streams to protect upland populations of threatened galaxiids from trout.

### Reduced water quality

Good water quality is vital for supporting productive fisheries. Reduced water quality due to increased nutrient concentrations, sedimentation, salinity and acidity, and reduced dissolved oxygen levels, can occur because of natural events (e.g. bushfires, floods, droughts and blackwater events) and because of poor land and water management (e.g. water over-extraction, pollutants, chemical run-off).





## In-stream habitat degradation

Logs, woody debris, aquatic vegetation and rocks are important in-stream habitats that provide shelter, food and breeding locations for fish and other aquatic animals. These structures are colonised by biofilms and aquatic insects, which form the basis of the food chain and food sources for fish. In-stream structures improve waterways by providing complex and diverse habitat, slowing flows, and helping to stabilise river channels. From the late 1800s to the late 1990s, extensive removal of large woody habitat and aquatic vegetation occurred in Victoria. Recent in-stream river habitat mapping (Figure 1) allows us to focus on areas where targeted restoration is best directed.

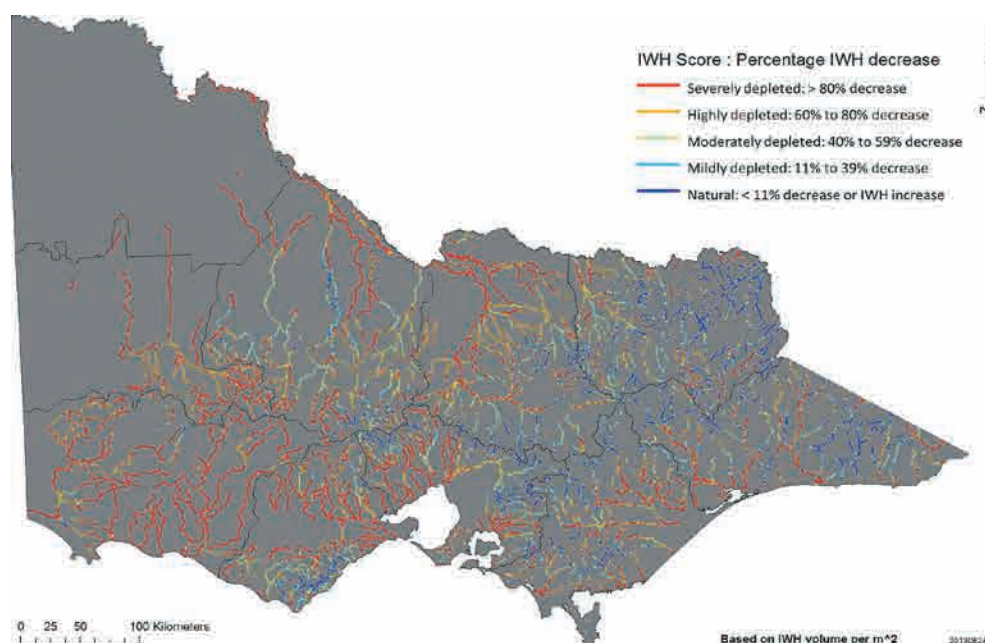


Figure 1. Many Victorian waterways have severely depleted in-stream woody habitat (IWH).  
(Source: Arthur Rylah Institute)

## Riparian habitat degradation

Riparian land is the land that adjoins rivers, creeks, lakes, wetlands and other waterways. The condition of the vegetation on riparian land influences the health of waterways. Trees contribute organic matter to waterways, including logs and woody debris, which provide in-stream habitat for fish. Riparian vegetation improves water quality by filtering out sediment, nutrients and pathogens from water run-off from the surrounding land. It also helps to stabilise riverbanks and to prevent erosion, and it shades waterways, thus regulating water temperature.

Historically, landscapes and riparian lands were extensively cleared of vegetation. Major threats to riparian vegetation include weeds, uncontrolled stock access, unmanaged vehicle access and stream crossings, litter, firewood collection, urban development, poorly managed agricultural practices, and recreational use.



## Introduced aquatic species

There are about 20 introduced freshwater fish species in Victoria. Some are listed as noxious species [such as carp, eastern gambusia and oriental weatherloach (*Misgurnus anguillicaudatus*)], while other species (particularly trout, salmon and redfin perch) form highly valued recreational fisheries. Several native fish species have also been translocated to sites outside their natural range. Introduced fish can damage fish habitats, reduce water quality and impact native fish populations through competition and predation. Redfin perch and trout have been implicated in the decline of small- and large-bodied native fish, such as galaxiids, trout cod, Macquarie perch, silver perch and golden perch. Invasive plants can also impact fisheries, for example, didymo or 'rock snot' (*Didymosphenia geminata*), which has seriously impacted overseas cool-water recreational fisheries.

## Inappropriate fish stocking

Fish stocking plays an important role in fisheries management, particularly through supporting 'put-and-take' fisheries and aiding recovery of threatened species. Translocation guidelines and protocols are in place to assess and manage the risks associated with fish stocking in Victorian public waters for conservation or recreational purposes. Such risks include genetic shifts in wild populations, hybridisation, the establishment of feral populations, adverse impacts on threatened species and habitat, and the introduction and spread of diseases and parasites. Unauthorised and/or incidental translocations of fish and other aquatic organisms also pose risks.





## Overfishing and illegal fishing

Overharvesting of valued recreational fish has historically impacted fish populations. The last commercial inland fishing entitlements (Schedule 8 waters) ended in 2002. Fisheries regulations aim to prevent overfishing and to help maintain sustainable fisheries. Take of fish species is regulated by enforcing bag limits, size limits, closed seasons, fishing equipment restrictions, etc. Recent changes to bag and size limits for Murray cod, golden perch, trout and other species are aimed at reducing fishing pressure. While there is a high level of compliance with fishing regulations, illegal fishing practices can have a significant local impact on fish populations and fish for the future. Some examples of illegal fishing activities in Victoria include fishing without a current Victorian Recreational Fishing Licence (unless you are exempt), taking fish during closed season, taking fish outside of legal limits (size, bag, possession), and using or possessing illegal fishing equipment (such as set lines, mesh nets, snares, explosives, firearms, bow and arrows). Significant resources are invested in combating illegal fishing activities to protect our fisheries. Fisheries Officers perform spot checks and covert operations all over Victoria to detect and prevent illegal fishing and other offences. Reports from the community of suspected illegal fishing activities in Victoria have led to a large number of convictions. With advances in recreational fishing techniques, the number of people fishing, and the popularity of particular fisheries, localised fishing pressure can also be a concern.

## Climate change

Victoria's temperature has steadily increased since the 1970s, and overall stream flows have decreased by around 50 per cent or more over the last 20 years. Climate science predicts Victoria will continue to become hotter and drier, with more extreme events, such as floods, droughts and bushfires. Across Victoria, average annual streamflows are projected to decrease by approximately 50 per cent in some catchments by 2065. Our freshwater environments and native fish populations have evolved with and adapted to natural flood and bushfire cycles. They may, however, have a reduced ability to withstand and recover from these events when they occur at increased frequencies, severities and intensities.

## Trout bounce back after fire and floods

## Case study

Recreational fishing for trout in the Ovens River is a major tourism drawcard for the townships of Harrietville and Bright. In February 2013, bushfire denuded all vegetation from the steep headwaters and gullies of the Ovens River. This was quickly followed by three severe rain events that eroded and carried silt and rubble from these headwaters to areas downstream. Trout populations and habitat were devastated, along with almost all native aquatic life.

Local recreational fishers, the Harrietville Community Forum, the Australian Trout Foundation, the North East Catchment Management Authority and other organisations banded together and embarked on several projects that focused on rehabilitating fish habitat, recovering the trout fishery and improving the amenity of the Ovens River near Frostys Corner (downstream of Harrietville).

With funding from the Recreational Fishing Grants Program, large boulders and logs were placed in-stream along 1.5 kilometres of river to provide habitat niches for fish, create greater flow variability, trap sediments and encourage aquatic vegetation growth. These works were complemented by woody weed removal, fencing, and native revegetation programs, and ultimately a successful recovery re-stocking with brown trout.

This collaborative project is a shining example of a whole-of-community approach delivering positive outcomes for the environment and fish, following extreme weather events. Trout, platypus (*Ornithorhynchus anatinus*), native water rat (*Hydromys chrysogaster*) and river blackfish (*Gadopsis marmoratus*) have since returned to this section of river.





## 2. Framework for managing Victoria's recreational fisheries



### 2.1 Scope

The Freshwater Fisheries Management Plan provides a statewide focus on sustainably managing freshwater recreational fisheries in rivers and streams, lakes and impoundments. It considers 15 of Victoria's most popular freshwater recreational species, including 13 finfish and 2 crustaceans (Appendix 2). The species are: Murray cod, trout cod, golden perch, Macquarie perch, silver perch, river blackfish, freshwater catfish, Australian bass (*Macquaria novemaculeata*), estuary perch (*Macquaria colonorum*), brown trout, rainbow trout, Chinook salmon, redfin perch, Murray spiny crayfish and common yabby (*Cherax destructor*). Although estuaries are not covered in this Plan, movement between rivers and their estuaries is an important part of the life cycle of some fish species.

The purpose of the Freshwater Fisheries Management Plan is to set out the strategic direction for managing freshwater recreational fisheries in Victoria; this in turn will inform an implementation plan.

### 2.2 Vision

The vision of the Freshwater Fisheries Management Plan is:

In partnership with the relevant agencies and community, we will continue to build better recreational fisheries by integrating fish, water and land management. This will secure the resource for current and future generations, share the resource among the community, and grow social, economic and cultural values.

### 2.3 Guiding principles

To deliver the Freshwater Fisheries Management Plan, the Victorian Fisheries Authority will:

- **Adopt a partnership approach**

Continue to work together with other government agencies, recreational fishers, Traditional Owners and other community members to sustainably manage and develop recreational fisheries.

- **Integrate management actions**

Apply an integrated, holistic approach to fish, land and water management to maximise fisheries outcomes and manage resources in an efficient and effective manner.

- **Achieve combined outcomes**

Prioritise actions that achieve multiple benefits for fish, fish habitat, and recreational fishing and realise broader community, social, environmental and economic benefits.

- **Be adaptable and responsive**

Ensure fisheries management is responsive to changing conditions and uses the best available evidence and knowledge.

## 2.4 Objectives of the Freshwater Fisheries Management Plan

The objectives contained in Section 3 of the Fisheries Act require Victoria's fisheries to be managed in an efficient, effective and ecologically sustainable manner. The following objectives for the Freshwater Fisheries Management Plan are consistent with these legislated objectives:

**Objective 1: Healthy recreational fisheries**—government, recreational fishers and the broader community working together to improve fish habitat and recreational fisheries

**Objective 2: A deeper understanding of our recreational fisheries**—recreational fishers, scientists and resource managers using the best available information to manage fisheries

**Objective 3: Working with Traditional Owners and Aboriginal Victorians**—Victorian Traditional Owners and their communities being active partners in recreational fisheries management

**Objective 4: Improving recreational fishing experiences**—recreational fishers having improved fishing opportunities and experiences

**Objective 5: Responsible recreational fishing**—recreational fishers adopting and promoting responsible fishing practices

The Plan will be implemented in collaboration with key partners.





## 2.5 Policy and legislative setting

Victoria's freshwater recreational fisheries are managed in accordance with the Fisheries Act and the *Fisheries Regulations 2009* (Vic.). The Fisheries Act provides the legislative framework for the regulation, management and conservation of Victoria's fisheries resources, including the protection and conservation support of aquatic habitats, and sets out the general provisions applicable to all recreational fishing activities and commercial licences.

The objectives of the Fisheries Act are:

- to provide for the management, development and use of Victoria's fisheries, aquaculture industries and associated aquatic biological resources in an efficient, effective and ecologically sustainable manner
- to protect and conserve fisheries resources, habitats and ecosystems, including the maintenance of aquatic ecological processes and genetic diversity
- to promote sustainable commercial fishing and viable aquaculture industries and quality recreational fishing opportunities for the benefit of present and future generations
- to facilitate access to fisheries resources for commercial, recreational, traditional and non-consumptive uses
- to promote the commercial fishing industry and to facilitate the rationalisation and restructuring of the industry
- to encourage the participation of resource users and the community in fisheries management.

Victoria's recreational fisheries resources will be managed in line with other key legislation and policy, including but not limited to:

### Key legislation:

- *Flora and Fauna Guarantee Act 1988* (Vic)
- *Environmental Protection and Biodiversity Conservation Act 1999* (Cwlth)
- *Catchment and Land Protection Act 1994* (Vic)
- *Crown Land (Reserves) Act 1978* (Vic)
- *Water Act 1989* (Vic)
- *Native Title Act 1993* (Cwlth)



**Relevant policy:**

- The Aboriginal Fishing Strategy (DPI 2012)
- Improving Our Waterways—Victorian Waterway Management Strategy (DEPI 2013)
- Water for Victoria—Water Plan (DELWP 2016)
- Protecting Victoria’s Environment—Biodiversity 2037 (DELWP 2017)
- Guidelines for Assessing Translocations of Live Aquatic Organisms in Victoria (DPI and DSE 2003)
- Protocols for the translocation of fish in Victorian inland public waters (DPI 2005)

The National Fish Habitat Strategy (FRDC 2018) was prepared to help protect and improve recreational fisheries into the future.



## 2.6 Working together

The Victorian Fisheries Authority is responsible for administering Victorian fisheries legislation, while other Victorian government agencies lead administration of legislation relating to water, land and biodiversity. The Victorian Fisheries Authority does not manage water or land. As water and land profoundly impact on the performance of our recreational fisheries, it is imperative that government agencies involved in fish, water and land management work together on shared interests, to deliver multiple benefits, avoid duplication of effort, leverage investment, and capitalise on value for investment (Appendix 3).

Indeed, such successful partnerships and united approaches to program delivery have already been occurring for many decades. Strong relationships exist between the Victorian Fisheries Authority, VRFish, Native Fish Australia, the Australian Trout Foundation, Futurefish, Fishcare Victoria, the broader recreational fishing community, the Department of Environment, Land, Water and Planning, catchment management authorities, Melbourne Water, local communities, Aboriginal people and other stakeholders. We have been collaborating on management initiatives relating to water resources and waterway rehabilitation, threatened species conservation, fish stocking, recreational fishing access and facilities, and recreational fisheries-related education. We also partner with interstate and national agencies and recreational fishing communities on fisheries management issues that are cross-jurisdictional issues. Fish don’t respect state boundaries, and elements from outside Victoria can impact our fisheries; thus, we need to work with a range of external partners to sustainably manage fisheries resources. In acting together, the achievements have been tremendous. The Victorian Fisheries Authority values these alliances and is keen to continue and build on these synergies for freshwater fisheries management into the future.

### 3. Healthy recreational fisheries



#### Government, recreational fishers and the broader community working together to improve fish habitat and recreational fisheries

The performance of Victoria's fisheries and recreational fishing is highly dependent on the environmental condition of waterways. Integrating fish, water and land management is essential for maximising outcomes for fisheries resources and recreational fishing, as well as for other environmental, social, cultural and economic values.

There are some tangible ways in which we can boost the sustainability and productivity of Victoria's fish populations:

- rehabilitating waterways and fish habitat, including water flows, to provide fish with habitat conditions vital for their survival, growth and natural breeding
- strategically stocking fish, to supplement the natural recruitment of fisheries in rivers and to maintain valued 'put-and-take' fisheries in impoundments
- focusing effort on managing 'at-risk' species to protect and recover fish populations, with the vision of rebuilding fisheries
- managing noxious fish, to reduce their impacts on valued native and salmonid fisheries, and fish habitat.



### 3.1 Environment rehabilitation through partnerships

#### **Priority: Rehabilitating river habitat and improving connectivity to support healthier fish populations**

The environmental health of waterways largely determines the survival, growth, breeding and abundance of fish. Recreational fishers are strong advocates for waterway health and are increasingly investing resources and volunteering their time to help restore habitat. The top priority for achieving healthier fisheries according to recreational fishers is better fish habitat.

Victoria's catchment management authorities, Melbourne Water and the Department of Environment, Land, Water and Planning have a strong focus on working with the community, including recreational fishers, to improve waterway health outcomes and ecological processes that underpin healthy fish populations. Providing conditions that support recruitment of populations will help populations recover naturally. Reinstating woody and rocky in-stream habitats, managing weeds, revegetating with native species, fencing, providing off-stream water sources and installing fishways are examples of the many on-ground activities that improve fisheries outcomes. Revenue from recreational fishing licence fees often contributes to funding these works.

Under the Victorian Government's Water for Victoria—Water Plan, \$222 million has been committed for the period 2016/17 to 2019/20 to improve waterway and catchment health. Because land and water management practices directly influence waterway health, recreational fisheries will greatly benefit from investment partnerships that protect and recover the condition of our waterways. Initiatives like the Angler Riparian Partnerships Program (2016/17 to 2019/20) (of the Water for Victoria—Water Plan) provide a pathway for recreational fishers to get involved and further advocate river rehabilitation. Many Traditional Owner groups have natural resource enterprises and can undertake on-ground works to help rehabilitate waterways.





## Case study Angler Riparian Partnerships Program



A key outcome of the Wild Trout Fishery Management Program was recognition that wild trout fisheries are highly vulnerable to the effects of climate change and climate variability. In particular, clearing of streamside vegetation and lack of shading is causing rivers to heat up, which causes trout to move to cooler water.

In response, recreational fishers are now actively partnering with catchment management authorities to improve the health of riparian land along Victorian waterways. Mentioned as a commitment in the Water for Victoria—Water Plan, the Victorian Government is providing \$1 million over 4 years (2016/17 to 2019/20) for the Angler Riparian Partnerships Program. This funding will be used for partnerships between the nine regional catchment management authorities and recreational angling groups to deliver riparian improvement works in areas of local priority for anglers. This will give recreational fishers the ability to work directly with catchment management authorities on riparian areas that are important to them to improve fishing in their favourite fishing streams. The program is being rolled out across regional catchment management areas and enhances all recreational fishing interests, both trout and native fish. Recreational fishers are increasingly volunteering their own time and resources to protect, recover and improve their favourite fishing waters.

### 3.2 Managing water for recreational fisheries outcomes

#### **Priority: Ensuring recreational fishing values are considered in water management policy**

The availability of water in Victoria into the future faces challenges under climate change predictions. Victoria is becoming warmer and drier, and the demand for water is increasing. Our population is now the fastest growing of all the Australian states. Already, there is less water available for competing needs—those of the environment, community, agriculture and industry. Most water resources are at their sustainable limits.

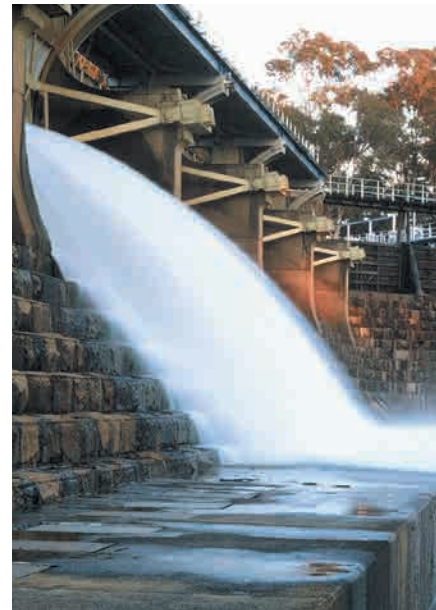
Appropriate management of water for recreational values, biodiversity and waterway health is addressed in the Victorian Government's Water for Victoria—Water Plan. Environmental water is critical for protecting fish and the overall health of waterways, and can also have shared benefits for recreational fishing outcomes.

The Victorian Fisheries Authority recognises the potential for using environmental water to improve habitat, river connectivity and fishery productivity, and to stimulate fish movement and breeding. By working more closely with the Victorian Environmental Water Holder and catchment management authorities, there are opportunities for improving the condition of rivers and realising the multiple benefits of environmental watering for the broader community.

Victoria's sustainable water strategies set out long-term plans for securing the water future of Victoria. Four regional sustainable water strategies covering the state have been produced. They identify regional threats to water availability, and include policies and actions for helping water users, water corporations and catchment management authorities to manage and respond to those threats over the next 50 years. Protecting and improving the health of waterways and aquifers, promoting sustainable water use, and securing water supplies are key elements of the sustainable water strategies, all of which have positive outcomes for fisheries management.

The Murray–Darling Basin Plan also offers the opportunity to work together in relation to water management and fisheries outcomes. The Murray–Darling Basin Plan sets sustainable diversion limits on the amount of surface water and groundwater that can be taken and used in catchments. The surface water sustainable diversion limits are set to recover an annual average of 2750 gigalitres of water across the Murray–Darling Basin for return to the environment. Victoria's share of this is 1075 gigalitres. The state government is preparing five water resource plans that show how Victoria will comply with its obligations as set out in the Murray–Darling Basin Plan.

The more we understand the water outlook, share information, and contribute to water entitlement decisions, the better we can prepare for fish stocking and other initiatives, and thus achieve greater benefits for recreational fisheries. We will actively work with water managers and recreational fishers to ensure that fisheries and recreational fishing outcomes are considered in statewide and regional water planning processes. We will look for opportunities to collaborate with water managers and recreational fishers to achieve multiple benefits from water management.



## Case study Making every drop count ... twice!

The Native Fish Recovery Plan – Gunbower and Lower Loddon provides a unique opportunity for restoring native fish populations and waterway health in the Central Murray system in northern Victoria.

Centred on the Gunbower Creek and Lower Loddon system, this plan provides an opportunity for increasing native fish populations, recovering threatened species and improving natural values, all integrated with vibrant and productive communities, irrigation and agriculture. The Native Fish Recovery Plan – Gunbower and Lower Loddon provides environmental water to rivers, wetlands and floodplains and will improve and restore ecosystem health, while maintaining productive irrigation industries.

It provides a novel way to achieve ecological outcomes within a highly regulated waterway system by embedding fish restoration flows into irrigation flows—that is, using every drop twice, first to assist native fish and then to meet consumptive uses.

Everyone wins from this plan! The recreational fishing community will benefit through the establishment of a trophy Murray cod fishery, and they will be seen by the non-fishing community as leading one of the largest fish habitat rehabilitation projects in Australia. Water allocation to the region's valuable and innovative agriculture industry will be maintained. Populations of locally extinct species will be re-established along the 190 kilometre network of creeks, lagoons, wetlands and floodplains. Ecosystems will thrive, and this in turn will help generate increased ecotourism to the area, so the local economy will thrive too.

This initiative is led by the North Central Catchment Management Authority in partnership with VRFish and the recreational fishing community, and it is supported by state and Commonwealth government funding.





### 3.3 Expanding and getting the best out of fish stocking

**Priority: Expanding and improving the effectiveness of fish stocking to recover threatened species and improve recreational fisheries**

The Victorian Fisheries Authority has a long and successful history of producing and stocking fish to recover threatened species and improve recreational fisheries. In many lakes and impoundments, well-targeted fish stocking has created exceptional fishing opportunities, such as in Lake Eildon (golden perch and Murray cod), Lake Toolondo (brown trout) and the Crater Lakes (Chinook salmon, rainbow trout and brown trout). The performance of stocked fish in rivers is more variable and less reliable. Stocking is an important management tool because many of our highly modified waterways no longer consistently provide conditions that support natural breeding.

The Victorian Government's Snobs Creek Hatchery has been in operation for more than 70 years. Here, Victorian Fisheries Authority staff produce and grow salmonids and native fish (other than species like silver perch, golden perch, Australian bass and estuary perch, which are sourced from commercial hatcheries). Operations of the Snobs Creek Hatchery are overseen by the Snobs Creek Advisory Board and receive significant investment from recreational fishing licence revenue. Fish stocking plans are developed using information gathered at annual regional consultative meetings with recreational fishing representatives and resource managers (known as Vic Fish Stock meetings).

Fish stocking proposals are assessed in accordance with the Victorian Government's fish translocation policies and protocols. Waters considered for stocking must satisfy the set criteria. Waters will not be stocked where there is reasonable evidence that the released fish species may pose an unacceptable risk to a threatened species or community, including small-bodied native fish. Protecting small-bodied and other native, non-recreational fish species is important for Victoria's biodiversity and waterway health. A recent (2018) Victorian Auditor-General's Office audit of freshwater fisheries management in Victoria found that the Victorian Fisheries Authority uses a range of robust scientific information, databases, and effective stakeholder and agency consultation processes to inform fish stocking outcomes.



Stocking fish requires a large financial investment, and improving stocking effectiveness will deliver better fish stocking outcomes and value for money. Increased understanding of the productivity of waterways could be used to better inform fish stocking decisions. For example, native fish fingerling stocking rates could be aligned to the availability of larval feed, which is a known limiting factor that can create a 'bottleneck' in the growth and survival of native fish. The development of more reliable, cost-effective and non-destructive methods for differentiating hatchery fish from wild fish would provide an important tool for evaluating the effectiveness of fish stocking and the extent of natural breeding.

## Case study Victorian threatened fish breeding and stocking program



Over the last 70 years, Victoria's Snobs Creek Hatchery near Eildon has made a huge difference to inland fishing. Breeding, transporting and stocking millions of fish into hundreds of waters every year has created wonderful fishing opportunities. Snobs Creek Hatchery has also led efforts to recover threatened native fish, many of which were once widespread and popular among recreational fishers. We have made great progress in recovering Murray cod and golden perch, but there is still more work to do to rebuild populations of other more threatened species. Snobs Creek Hatchery is now operating at full production capacity.

The development of the Freshwater Fisheries Management Plan has identified an opportunity for expanding the breeding and stocking of recreationally important threatened species, such as Macquarie perch, trout cod and freshwater catfish, as well as small-bodied native fish, such as southern pygmy perch (*Nannoperca australis*), Murray hardyhead (*Craterocephalus fluviatilis*) and galaxiid species. Because many of these species are locally extinct, a stocking program is the only recovery option.

By building on the momentum of the 2015–2019 *Target One Million* plan, Water for Victoria—Water Plan, Protecting Victoria's Environment – Biodiversity 2037, the Murray–Darling Basin Plan and the National Carp Control Plan, we can develop further native hatchery opportunities.

While we continue to invest in river habitat rehabilitation, a collaborative effort and commitment to breeding and stocking threatened native fish is the next big opportunity for making a real difference for our threatened fisheries, and the timing is good.

### 3.4 Recovering 'at-risk' species

#### **Priority: Developing and implementing statewide recovery plans for 'at-risk' fish species**

Over 25 freshwater fish species are listed as threatened or endangered under state or Commonwealth legislation. They include many of our most popular and iconic native recreational fish species, such as Murray cod, trout cod and Macquarie perch, as well as several small-bodied native fish, such as Murray hardyhead, Yarra pygmy perch (*Nannoperca obscura*) and many galaxiid species. Small-bodied native fish species are a vital component of Victoria's biodiversity and contribute to the food chain for larger fish. Protecting and recovering listed threatened species and other species at risk or in decline will help ensure sustainable fisheries and future recreational fishing opportunities.

To rebuild and secure fish populations, it is important to identify their current distributions and stronghold populations, as well as to understand and address the threats that led to their decline. In May 2017, staff from the Victorian Fisheries Authority and the Arthur Rylah Institute undertook a preliminary risk assessment of key threats to freshwater recreational species considered in this Plan, at a statewide level. For many species, habitat-associated threats posed high to moderate risk. In-stream habitat degradation, climate change impacts, altered natural flows, and barriers to fish passage posed a high risk to multiple species. River blackfish, freshwater catfish, Macquarie perch and Australian bass were found to be the species most at risk, being impacted by multiple threats that pose high risk. Trout are at high risk from the impacts of climate change and degraded riparian habitats. Participants in the risk assessment workshop recognised the need for a coordinated, cross-agency approach and long-term investment to enable the recovery of at-risk species.

Working in partnership with stakeholders to address key threats and to appropriately manage at-risk species will be a focus for achieving conservation outcomes and improving our recreational fisheries. Recreational fishers play an important role in the recovery of threatened species. Since the 1980s, Native Fish Australia have contributed greatly to recovery planning and implementation for a number species, including Murray cod, trout cod and Macquarie perch. Their hatchery facilities offer the potential for small-bodied native fish production, and they actively undertake on-ground works to repair fish habitat. The Australian Trout Foundation have been working with the Department of Environment, Land, Water and Planning and other agencies to undertake a range of recovery actions, such as the installing of artificial barriers and the replanting of riverbanks, to protect galaxiid species.





We will build on existing recovery plans and develop specific actions, supported by key government agencies, including catchment management authorities and recreational fisher organisations. Through this process, funding will be focused and leveraged by investor partners to maximise recovery at locations where efforts are most likely to be successful, which it is hoped will achieve multiple benefits and play an important role in helping secure species at a statewide level.

Our Snobs Creek Hatchery is currently running at full production capacity. New opportunities are being investigated for partnering with other agencies and recreational fishers to expand the production of threatened species like freshwater catfish, Macquarie perch and trout cod. If viable, new hatchery infrastructure will be established for growing these and small-bodied threatened native fish. The Victorian Fisheries Authority will work closely with the Department of Environment, Land, Water and Planning and other stakeholders to identify the waters appropriate for receiving fish to maximise recovery outcomes.



## Recovering endangered trout cod in the Ovens River

### Case study

Trout cod is an iconic, long-lived fish species native to the Murray–Darling Basin. Once common, they have suffered a catastrophic decline in abundance and distribution over the last century due to poor land and water management practices and overfishing. By the late 1970s, the only remaining significant breeding populations of trout cod were in the Murray River between Yarrawonga and Cobram, and a translocated population in Seven Creeks.

Between 1997 and 2006, Fisheries Victoria bred and released more than 280,000 trout cod fingerlings into the mid–Ovens River. Since then, surveys show stocked trout cod have survived, reached maturity and successfully bred in the wild. The effectiveness of fish stocking was greatly enhanced through a variety of habitat works (improving fish passage and connectivity, and restoring bankside vegetation). In 2015, Fisheries Victoria implemented the 2015–2019 *Target One Million* plan commitment to establish new recreational fisheries for trout cod in lakes Sambell and Kerferd. This initiative raised community awareness of the need for continued support for trout cod conservation recovery efforts.

The recovery of the trout cod in the Ovens River is a great example of what can be achieved by integrating fish (stocking), water (removal of barriers to fish passage) and land management (riparian restoration). The trout cod program has a long-term vision, beginning with conserving and reducing risk to populations, then moving towards opening recreational fisheries. The opening of lakes Sambell and Kerferd has been a big, collaborative, strategically planned win! While there is much still to be done to recover trout cod in other waterways, the Ovens River case study will help guide future recovery efforts and pave the way forward to recovering other threatened species, like Macquarie perch and freshwater catfish.





### 3.5 Dealing with invasive species

#### **Priority: Managing noxious or pest species in freshwater environments and delivering the National Carp Control Plan in Victoria, if approved**

Invasive species pose a significant threat to Victoria's freshwater environments and recreational fishing. Multiple invasive species, including plants, vertebrates [e.g. carp, red-eared slider turtles (*Trachemys scripta elegans*), smooth newts (*Lissotriton vulgaris*)] and invertebrates, currently occur in Victorian waterways. Some species are declared noxious under the Fisheries Act, or noxious weeds or pest animals under the *Catchment and Land Protection Act 1994* (Vic.). Many introductions have occurred through the legacy of European settlement and the associated acclimatisation of animals and plants, and through increased globalisation, trade and travel.

It is very difficult to eradicate invasive species, particularly in aquatic environments; therefore, effort is best directed towards preventing their entry, establishment and spread. Raising awareness about aquatic biosecurity issues and the public reporting process is essential. Effective management of invasive species relies on the combined efforts of government, community, industry and other land managers. Recreational fishers can play a role in deterring the entry and spread of invasive species.

#### **The National Carp Control Plan**

Carp are a major aquatic pest species, making up most of the fish biomass in many Australian waterways. They pose significant environmental, economic, social and cultural threats, including impacts on water quality, aquatic vegetation, native fish populations and the amenity value of our rivers and lakes.

The Australian Government has committed nearly \$11 million over 2.5 years for developing the National Carp Control Plan, and the Fisheries Research and Development Corporation is leading the planning process. The key control measure includes a proposal to release the Cyprinid herpesvirus 3 (CyHV-3 or carp herpesvirus) as a live biological control agent for controlling carp populations. Significant work is needed to make sure the virus is the best option for controlling carp and that, if it goes ahead, it is as effective as possible. Developing the National Carp Control Plan will require:

- accurately assessing the biomass of carp
- accurately calculating the current economic cost of the effects of carp in the waterways



- determining the costs involved in releasing the virus and the benefits of the release
- modelling how the virus would spread if it was released to determine the most effective method of distributing the virus
- developing strategies for managing the disposal of dead carp.

At the end of 2018, the completed National Carp Control Plan will be provided to the Australian Government, who will then decide whether or not to go ahead with the virus release.

The Victorian Government is working with the Fisheries Research and Development Corporation and other state and territory governments on developing the National Carp Control Plan. The potential release of the virus to remove carp from our waterways is a significant step and is expected to have a positive effect on both native fish populations and the environmental health of our waterways. Removal of the carp presents a unique opportunity for simultaneously investing in complementary measures to give native fisheries a boost while carp abundances are reduced (e.g. by improving fish habitat and fish stocking).

Efforts to control carp numbers may also include commercial fishing methods such as electro-fishing, netting, trapping and or, targeted recreational harvesting e.g. catch a carp events. In isolation, these measures are more likely to be effective at a local, rather than a catchment or basin-wide-scale. Integrating these harvest measures with other interventions e.g. improving fish passage, habitat restoration, environmental watering and native fish stocking, provide a synergistic effect which could mitigate the impact of carp and, accelerate the recovery of threatened native fish in priority waterways.



## 4. A deeper understanding of our recreational fisheries



### Recreational fishers, scientists and resource managers using the best available information to manage fisheries

Freshwater fisheries are complex and dynamic—there are many factors that influence the survival, growth and performance of fish populations and recreational fisheries. Information from monitoring and assessment provides evidence for informing fisheries management and direction on how to get the best out of our fisheries. Monitoring and assessment is important for:

- understanding, demonstrating and improving the sustainability of Victoria's freshwater fisheries
- providing information on the adequacy of fisheries management interventions
- evaluating recreational fisher feedback/perceptions of fishery performance
- building the capacity of stakeholders in natural resource management through engagement and participation.
- informing adaptive management
- improving recreational fishing outcomes.

Across Victoria, there are estimated to be more than 500 waters supporting recreational fisheries; however, it is not practical or cost-effective to monitor all fisheries. There are a range of scientific methods available for addressing the significant information gaps and focusing interventions to achieve 'best bang for buck' outcomes for fisheries, and best practice management. Considering this, monitoring and assessment will focus on a subset of 32 reference waters, covering popular fisheries in rivers, lakes and impoundments, important threatened species populations, and a statewide geographical spread (Table 1).

Priority native fish waters will be monitored and findings reported under the Native Fish Report Card Program sponsored by the Victorian Fisheries Authority, the Department of Environment, Land, Water and Planning and recreational fishing licence funds. Priority trout rivers will be monitored under the Wild Trout Fisheries Management Program, with input from the Victorian Trout Fishery Reference Group.

Citizen science projects that encourage recreational fishers to report catch and effort information, can provide valuable insight to the performance and condition of the recreational fisheries.

An audit of the Victorian Fisheries Authority's management of freshwater fisheries by the Victorian Auditor General's Office (2018), acknowledged improved engagement with other natural resource managers and, the development of a stronger evidence base to support future decision-making.

**Table 1. Reference waters for monitoring and assessment of Victoria's freshwater fisheries**

<b>Reference rivers</b>	
<i>Native fish</i>	
Gellibrand River	Mitchell River
Glenelg River	Ovens River
Gunbower Creek	Thomson River
Lindsay River/Mullaroo Creek	Wimmera River
Lower Goulburn River	Yarra River
<i>Trout</i>	
Goulburn River	Howqua River
King River	Traralgon Creek
Jamieson River	Buckland River
<b>Reference lakes and impoundments</b>	
Blue Rock Lake	Lake Fyans
Cairn Curran Reservoir	Lake Glenmaggie
Devilbend Reservoir	Lake Hume
Hepburn Lagoon	Lake Nagambie/Goulburn Weir
Kangaroo Lake	Lake Purrumbete
Lake Bullen Merri	Lake Wendouree
Lake Eildon	Rocklands Reservoir
Lake Eppalock	Toolondo Reservoir







## 4.1 Monitoring fish population health

### **Priority: Monitoring and assessing the health of recreational fish populations in selected reference rivers**

To manage fisheries, an understanding of fish distribution and the health of populations is needed. Fish population health indicators will be used to report on the relative performance of key fisheries. Health indicators may include: the number of fish present in the population, the extent to which breeding has occurred, the presence of stocked fish, fish movement into the population, and whether there are a range of size classes present for future replenishment. Aligning fish information with waterway condition is important for guiding water and land management.

Fish population health monitoring is typically conducted using fisheries-independent survey methods, such as electrofishing and fyke netting. As these methods can be resource-intensive, population health monitoring will be prioritised for selected reference rivers where some of the 'high-risk' fisheries and self-sustaining fish populations exist. It is envisaged that population health information would be collected for all reference rivers on a frequent basis, such as every 1–2 years or as required.

## 4.2 Tracking the performance of recreational fisheries

### **Priority: Assessing the performance of recreational fisheries by expanding the angler catch and effort program**

In addition to fish population surveys for tracking the population status and health, the Victorian Fisheries Authority will expand the collection of recreational catch data. To date, assessing the performance of our freshwater recreational fisheries has largely relied on anecdotal and social feedback from a wide variety of fishers (in terms of skills and fishing methods). While this is important feedback, there is an opportunity to collect more systematic information about recreational catch and the effort (time) taken to achieve these catches (i.e. catch rate). Information on the rate of fish being harvested (harvest rate), the rate of fish being caught and released (release rate) and the rate of recreational fishers visiting particular locations (visitation rate) can provide valuable insights into how a fishery is performing.

The Victorian Fisheries Authority will survey recreational fishers via a statewide email survey, gathering information on recreational fisher demographics, fishing expertise, visitation, satisfaction, and preferences relating to target species, fishing locations and fishing methods. The survey will also identify a subset of recreational fishers who are prepared to report more specific details of their recreational fishing catch and effort on reference waters during key fishing periods. This will be used to establish an avid angler catch-and-effort program. These methods will, for the first time, provide an objective way of measuring the quality of our key recreational fisheries and should yield valuable insights into the effectiveness of our interventions (e.g. fish stocking and habitat restoration).

### 4.3 Towards a harvest strategy

**Priority: Developing a harvest strategy for selected freshwater fisheries, using information from fish population health monitoring and recreational fisher feedback**

This Plan is a commitment to the systematic collection of data on the performance of our priority freshwater recreational fisheries. It is impractical to collect data on all species and all waters, so we will focus on the 15 popular targeted species outlined in this Plan and the key waters in which these species are most often sought. Over time, this information will be used to develop a harvest strategy.

A harvest strategy is a decision-making document and process setting out specific management actions to be undertaken if and when the health status of a fishery changes. It includes rules around fishery indicators (such as catch-per-unit-effort or recreational fisher satisfaction) whereby decisions can be made regarding management actions to be implemented. For example, if recreational fisher catch-per-unit-effort in a lake falls below an acceptable level, it would trigger a fish population survey to investigate the extent and cause of the decline. The information gained could then be used to institute changes to fisheries rules and regulations, as needed, to ensure the long-term sustainability of fisheries. Regular review of fisheries rules and regulations occurs every 10 years. It is envisaged that after 5 years of implementing this Plan, there may be sufficient data available to allow the development of an appropriate harvest strategy for our key inland recreational fisheries.



## Case Study Murray cod slot limits—regulations informed by science

To protect Murray cod stocks from overfishing, fisheries managers have historically relied on increasing the minimum size limit at which Murray cod can legally be taken by recreational fishers. In 2014, Fisheries Victoria together with international experts explored the use of both a minimum and maximum size limit (slot limits) as an alternative fishery management tool for protecting Murray cod populations. A range of size and bag limit scenarios were tested through two independent Murray cod fish population models.



Research led by the Arthur Rylah Institute showed that slot limits, when compared with current and past regulations, will perform better in terms of building Murray cod populations over time, increasing the number of Murray cod available for recreational fishers to harvest and increasing the number of larger mature brood fish, which would be protected by regulation. A reference group of recreational fishers, fisheries managers and researchers has supported the use of slot limits for Murray cod in Victoria.

After extensive consultation with the public and between the Victorian and New South Wales governments, new regulations for Murray cod were introduced on 1 December 2014. A common size limit of 55–75 centimetres for Murray cod caught in Victorian and New South Wales waters was declared; in Victoria, a daily bag limit of one in rivers and two in lakes was also declared. The reduced bag limit in rivers enables Victorian anglers to take one smaller fish for the table, while ensuring all large breeders are returned to the water and contribute to future populations.

The use of slots limits is expected to reduce fishing pressure and improve Murray cod fishing outcomes. Informed by world-class science and extensive consultation, new Murray cod regulations are now widely supported by recreational fishers.



## 4.4 Evaluating fishery interventions

### **Priority: Monitoring and assessing the response of fish populations to management interventions**

Monitoring fish populations and fishery performance can provide the data needed for an efficient assessment program; however, additional monitoring and assessment may be needed to understand the effectiveness of specific management interventions, such as fisheries regulations, fish stocking, habitat enhancement and environmental flows. In these cases, applying learnings from fishery intervention monitoring and assessment will enable continual improvement, adaptive management and best practice. Some examples of additional monitoring and assessment may include:

- targeted fisheries-independent population surveys of other waters, including popular lakes and impoundments
- population assessments to determine distribution, abundance, breeding, recruitment and movement
- genetic assessments seeking to understand genetic diversity and to inform conservation, translocation and stocking
- collection of fish ear bones (otoliths) to age fish and help estimate fishing mortality
- mark, tag, track and recapture studies to determine fish growth, movement and fish mortality
- site-specific surveys to assess, for example, fish passage through new fishways, utilisation of newly installed in-stream habitats, and fish breeding and movement in response to environmental flows
- creel surveys of recreational fishers to determine total catch, total effort, and recreational fisher satisfaction and preferences.



## 5. Working with Traditional Owners and Aboriginal Victorians



Victorian Traditional Owners and their communities being active partners in recreational fisheries management

### 5.1 Value of freshwater fisheries to Aboriginal Victorians

Aboriginal people have a strong connection to the land and water that has endured for tens of thousands of years—it is central to their identity and culture. For Aboriginal people, cultural values are informed by and interconnected with traditional uses, spiritual connection, ancestral ties and respect for waterways, the land, the sea and the resources these provide.

Fishing is an integral part of the cultural and economic life of Aboriginal communities. It provides an important source of food and is part of cultural and ceremonial life. Many fish species have deep and cultural significance to Aboriginal communities. For example, Murray cod or 'Burnanga' are in the creation dreamtime stories of Aboriginal communities along the Murray River. 'Burnanga' are central to the land and waterways there and are highly valued as part of Country; they are frequently recognised as totems.

A range of native fish were, and continue to be, important as a resource for Aboriginal communities. Their use for communal gatherings and for barter and trade was extensive in pre-colonial times. Aboriginal people continue to fish throughout regional Victoria.

## Murray cod creation story

The Upper Murray region in northern Victoria in Yorta Yorta [Kwat Kwat] Country is a stronghold of the Murray cod creation story. It is known as 'Burnanga' by the Yorta Yorta people, and the cultural significance of the Murray cod can be traced back through the millennia.



Creation stories from this region describe Burnanga's journey through Kwat Kwat Country to the Lower Murray region of the Coorong, located in Ngarrindjeri Country, where the Murray cod is known as Ponde, or Pondi, a giant ancestral Murray cod and the creator of, or creative force for, the Murray River. Several variations of the creation story exist; however, there are two frequent and thoroughly attributed accounts.

Today, most Aboriginal people share the belief, along with much of the wider Murray–Darling Basin community, that the Murray cod is the 'number one' fish and the river's heart and soul. Aboriginal People across the Murray–Darling Basin share a strong concern for the condition of its major waterways and a desire for healthier environments, expressing the general view that, "If the river is fixed up, then the cod will be alright".

## Case study

Here is one account of Burnanga, the Murray cod, creator of our waterways.

... [Burnanga] a huge Murray cod journey through Kwat Kwat (Yorta Yorta) Country on his journey to the Coorong ... As Burnanga passed through our fish traps he swished his tail which created our water holes and stars in the sky.

(Uncle Col Walker, Yorta Yorta Elder)

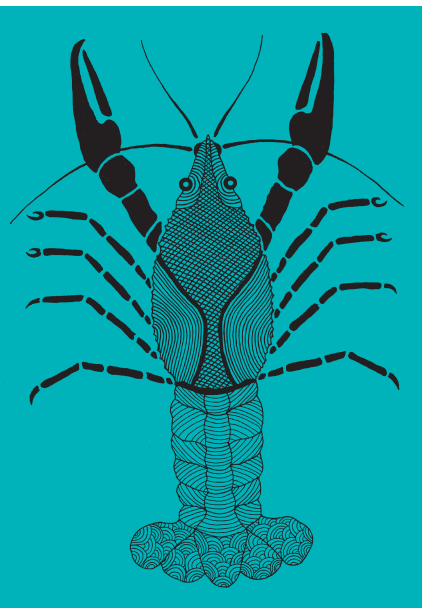
## 5.2 Legal rights and policies

Traditional Owner recognition is consistent with the Victorian *Charter of Human Rights and Responsibilities Act 2006*, which upholds the rights of Aboriginal Victorians, who assert their rights as Traditional Owners, to continue to: enjoy their identity and culture; maintain and use their language; maintain their kinship ties; and maintain their distinctive spiritual, material and economic relationship with the land and waters and other resources with which they have a connection under traditional laws and customs.

Victorian Traditional Owners currently have rights to access natural resources recognised under law. Members of recognised Traditional Owner groups with a native title determination under the Commonwealth's *Native Title Act 1993* have non-exclusive rights to hunt, fish and gather natural resources for personal, communal and cultural purposes, without the need to obtain a licence. At present, three Victorian Traditional Owner groups have native title determinations: Gunaikurnai, Gunditjmara and Wotjaboluk.







Aboriginal rights are also recognised under Victoria's *Traditional Owner Settlement Act 2010*. Under this alternative settlement framework, the state partners with Traditional Owner groups to negotiate a comprehensive settlement agreement that recognises their relationship to land and water, confers certain access, ownership and management rights over the land, determines decision-making rights for land development and natural resource management, and sustainably resources the Traditional Owner group to give effect to the settlement. A settlement may include access to freshwater fisheries for traditional and specified commercial purposes. Native Title holders and Traditional Owners who have reached settlement agreements under the *Traditional Owner Settlement Act* are automatically ascribed Registered Aboriginal Party responsibilities.

At present, settlements have been reached with the Gunaikurnai and the Dja Dja Wurrung peoples. A number of Traditional Owner groups intend to reach settlements under the *Traditional Owner Settlement Act* and are in the pre-negotiation or negotiation phase with the state.

Many places and objects found throughout Victoria and its waters are of cultural heritage significance to the Aboriginal people of Victoria. They are protected under the *Aboriginal Heritage Act 2006* (Vic.) and *Aboriginal Heritage Amendment Act 2016* (Vic.) from activities likely to harm Aboriginal heritage values. All ancestral remains located *in situ* on private or public land must be reported immediately to the Victorian Aboriginal Heritage Council.

The Victorian Aboriginal Fishing Strategy aims to incorporate the rights, interests, aspirations and culture of Aboriginal people into fisheries management. The strategy focuses on achieving three key outcomes: (i) recognition of Aboriginal customary fishing rights for recognised Traditional Owner groups, (ii) better economic opportunities for all Aboriginal people in fishing and related industries, and (iii) sustainable fisheries management in collaboration with Traditional Owner groups.

To develop and support implementation of the Aboriginal Fishing Strategy, the Victorian Fisheries Authority employs an Aboriginal Project Officer and has secured research funding to undertake an Aboriginal Customary Fishing Program. Through implementing this strategy, several tangible outcomes for Traditional Owners have been delivered.

Through the Bullarto–Buluk DEDJTR's Aboriginal Inclusion Action Plan 2016–18, the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) is committed to working in partnership with Aboriginal people and communities, supporting inclusive economic participation, progressing reconciliation and contributing to state and national efforts to 'Close the Gap'.

Several Traditional Owner communities have natural resource enterprises with experience to undertake land and water restoration works on Country. Several Victorian Government policies identify opportunities for supporting Aboriginal participation and capacity-building in natural resource management, including the Water for Victoria—Water Plan and Protecting Victoria’s Environment—Biodiversity 2037.

Native Title Services Victoria (NTSV), the Federation of Victorian Traditional Owner Corporations (FVTOC) and the Victorian Aboriginal Heritage Council (VAHC) are the key consultative bodies in Victoria with whom to engage regarding the rights and interests of Aboriginal Victorians. NTSV is the legal service that represents Victorian native title claimants and can advise on requirements under the Native Title Act and the Traditional Owner Settlement Act. NTSV supports the FVTOC, which comprises formally recognised Traditional Owner organisations. The FVTOC priorities are: to be involved in policy that affects Country and to create sustainable businesses that can leverage from Traditional Owner settlements. The VAHC is responsible for appointing, overseeing and supervising the operations of Registered Aboriginal Parties. Among the VAHC’s many functions is promotion of understanding and awareness of Aboriginal heritage.

**Priority: Expanding consultation and looking for opportunities to partner with Traditional Owners and Aboriginal Victorians to deliver shared benefits**

In practical terms, the Victorian Fisheries Authority will look for opportunities to share information and build meaningful relationships with Traditional Owners and Aboriginal Victorians. The Victorian Fisheries Authority will engage Traditional Owners and knowledge holders in order to understand and include Aboriginal values and traditional ecological knowledge in fisheries planning and management. The Victorian Fisheries Authority will support the access of Aboriginal people to fisheries resources for economic development, and support Aboriginal skills and capability development with a view to increasing Aboriginal participation in fisheries management. This will encourage Aboriginal participation in the development of fish stocking plans, at fish stocking events, in fish population surveys and in river habitat improvement works. Traditional Owners will also be involved in the research and monitoring of fisheries resources.

## 6. Improving recreational fishing experiences



### Recreational fishers having improved fishing opportunities and experiences

The social and wellbeing benefits of recreational fishing and other nature-based activities are well recognised. There are many motivations for recreational fishers, including catching and sometimes harvesting a fish (for consumption), spending time with family and friends, relaxation, and getting outdoors.

The ability to reliably catch a fish requires considerable knowledge, the right fishing gear and fishing expertise. Unfortunately, a high proportion of recreational fishers are not successful at catching fish. Decisions around the simple act of 'going fishing' can influence recreational fishing experiences and outcomes. Productive recreational fishers use a range of information to help decide where to go fishing and what species to target, including past fishing success, access locations, the weather, time of year, fish stocking history, environmental conditions, etc. These fishers tend to accumulate this information on a personal level through many years of experience.

Recreational fishing clubs are valuable for connecting people with similar interests in fishing, sharing information, developing fishing skills and providing expert guidance. The tackle industry also plays an important role in providing equipment and knowledge for improving fishing success. The Victorian Fisheries Authority will work with partner stakeholders to help improve recreational fishing experiences by advocating for access to fishing destinations, by connecting and communicating with recreational fishers to aid their decision-making, and by promoting fishing destinations.





## 6.1 Facilitating fishing access

### **Priority: Protecting and facilitating recreational fisher access**

Limited recreational fisher access (boat- and land-based) to fishing waters can be a significant barrier to recreational fishing. Government agencies and corporations may restrict recreational fishing access to public waters for a range of valid reasons, for example, to protect public safety, to protect ecologically important habitat, to protect critical infrastructure, and to maintain vehicle access roads. Some of our most important recreational fisheries are public waters managed by water corporations for irrigation purposes or domestic water storage, and for these, recreational access and amenity have historically been lower-order priorities.

Crown land water frontage licences, often for livestock grazing, are routinely used to manage and maintain crown land allotments close to waterways. Licences retain the public right to enter and remain on the land for certain recreational purposes such as recreational fishing. On occasion, some licensees do not comply with the licence conditions and choose to lock gates, deny public access or mismanage crown land water frontage. There are opportunities to use digital mapping platforms to identify and encourage recreational fishing access locations.

Parks Victoria manages more than 4 million hectares of public land and hundreds of national, state and local parks and conservation areas, many of which are important to recreational fishers. Recent research suggests that wild trout fisheries are vulnerable to climate change and will contract to cooler waters, to which access could be improved. Some of these cooler waters are located on public land.

VRFish strongly advocates on behalf of recreational fishers for access, for example, to Lake Dartmouth and Devilbend Reservoir, and works closely with the Victorian Fisheries Authority to help facilitate access. The Victorian Fisheries Authority is best placed to work with recreational fishers, land managers and other government agencies to advocate for safe and easy recreational fishing access on a case-by-case basis. Strengthening partnerships with land management agencies also provides opportunity for broader management approaches, for example, around conservation, visitor behaviour and camping areas.





## 6.2 Connecting with recreational fishers

### **Priority: Strengthening connections between government and recreational fishers to inform fisheries management**

Fisheries management is underpinned by open, two-way communication between government and recreational fishers. The recreational fishing community is diverse, with people of different backgrounds, needs, values, aspirations, and fishing expectations. It comprises people of different genders and ages, people with culturally and linguistically diverse backgrounds, people of all abilities, people who live in rural Victoria, people living in cities, and people with different fishing preferences. A range of communication methods and tools are required for reaching such a broad group.

VRFish plays an important role in connecting government and recreational fishers and is funded through recreational fishing licence funds to represent the interests of Victorian recreational fishers. VRFish consults and engages with Victoria's recreational fishing community to gather their views and feedback, to create opportunities for empowerment, participation and involvement, and to share information.

The Victorian Fisheries Authority works collaboratively with other partner stakeholders to communicate with recreational fishers, including VRFish, the Australian Trout Foundation, Native Fish Australia, Futurefish and other state and regional fisheries advocacy organisations. Project meetings, reference groups, regional forums, the Statewide Recreational Fishing Roundtable Forum and numerous presentations to angling clubs are avenues for directly engaging with recreational fishers. The Victorian Fisheries Authority is among the most progressive agencies in Victoria in the use of social media such as Facebook, Twitter, Instagram and Snapchat. Fisheries Officers are on the water every day talking with recreational fishers. Children and community are engaged through educational programs in schools and at the Marine and Freshwater Discovery Centre (Queenscliff). Information is shared with broad audiences through television, radio, short videos, and articles in newspapers, magazines and e-newsletters (e.g. Fish-e-Facts). Special events, like the trout and native fish conferences, trout season opening celebrations, expos, talks at angling clubs, and meetings, are opportunities for Victorian Fisheries Authority staff, other government agency staff and recreational fishers to meet face-to-face and share ideas and experiences.

## 6.3 Promoting fishing destinations

### **Priority: Promoting Victoria's premier recreational fishing destinations to encourage fishing participation and regional tourism**

The Victorian Fisheries Authority is working to develop location-based fishing opportunities in Victoria where conditions best support the survival and growth of popular recreational fish species. Already, we have several highly valued fishery destinations across Victoria, including our wild alpine trout rivers, the Gippsland Australian bass trail, trophy trout in the western district lakes, popular native fisheries in impoundments and lowland rivers, and family-friendly fishing waters (Table 2). There are fishing opportunities and destinations to suit most recreational fishers at all times of the year. Recreational fishing makes a strong contribution to local economies through supporting regional tourism and employment. There is scope to profile and better promote Victorian fishing opportunities in collaboration with other stakeholders, particularly Tourism Victoria, Visit Victoria, regional Tourism Boards, local councils and VRFish. There are strong links between recreational fishing and tourism, and there are opportunities to better promote fishing destinations in tourism planning and promotional products. Encouraging fishing participation and regional fishing destinations will in turn help maximise the economic return to Victorian communities.







**Table 2. Examples of Victoria's key recreational fishing tourism destinations**

<b>Fishery destinations</b>	<b>Description / Target species</b>	<b>Status</b>
Western district trophy trout	Fish the shallow and deep lakes of the western volcanic plains for trophy trout and salmon.	Established
Gippsland Australian bass trail	Blue Rock Lake, Lake Glenmaggie and the Mitchell, Tambo, Macalister and Snowy rivers provide wilderness river and stocked impoundment Australian bass fisheries.	Developing
Wild alpine trout	Fish for wild brown trout and rainbow trout in our iconic freestone rivers and streams in north-eastern Victoria's highlands, e.g. the Howqua and Ovens rivers and Nariel Creek.	Established
Tailrace trout fisheries	Fish for brown trout and rainbow trout in the secure and cold waters of the Goulburn River (below Eildon) and Mitta Mitta River (below Dartmouth).	Established
Impoundment natives	Some of Victoria's most productive irrigation impoundments have been developed as high-quality mixed native fisheries featuring golden perch and Murray cod. They include: Lake Eildon, Lake Nagambie, Lake Nillahcootie, Lake Eppalock, Cairn Curran and the Kerang Lakes, e.g. Kangaroo Lake and Lake Charm.	Established
Southern estuary perch impoundments	Victoria is the only State in Australia where anglers can catch stocked estuary perch. They are in southern impoundments, including: Devilbend Reservoir, Lake Hamilton, Albert Park Lake and Melton Reservoir.	Developing
Native fish rivers	Navigate the snags of the Ovens, Goulburn, Wimmera and Loddon rivers and Broken Creek to catch Murray cod, golden perch, freshwater catfish and/or trout cod.	Established
Family-friendly lake fisheries	Take the kids down to one of 80 small 'family-friendly' lakes that are stocked with ready-to-catch rainbow trout for the school holidays.	Developing

## Destination fisheries—the Crater Lakes

## Case study

The crater lakes of Victoria's western district, near Camperdown, offer exciting fishing opportunities in the cool and unusually deep lakes formed thousands of years ago when the volcanoes were once active. Both lakes Bullen Merri and Purrumbete now provide an angling experience that is not available anywhere else in Australia. For example, these are the only lakes in Australia where anglers can target the mighty Chinook or king salmon—one of the world's most sought-after sports fish. Fish growth rates in these lakes are spurred on by huge clouds of baitfish, and both lakes are renowned trophy fish destinations. In these lakes, Chinook salmon can reach 10 kilograms or more, and brown trout of more than 5 kilograms are not uncommon.

Equally, Lake Purrumbete provides a great family fishing experience as large numbers of redfin seem in endless supply. These fishing opportunities draw anglers from far and wide and generate fishing-related tourism that supports the local economy. A 2013–2014 fishing-related economic survey of Lake Purrumbete estimated the fishery to be worth over \$2 million annually, providing enormous social and economic benefits to anglers and to the local economy, because anglers buy food, petrol and tackle from local stores and stay in local accommodation.

The present management of the crater lakes aims to provide high-quality recreational fishing, including the chance of encountering a trophy fish. Good access and facilities at the lakes and nearby towns provide a visiting angler with all the amenities required to support day visits or an extended trip.

Promotion of the crater lakes will encourage visitation, increase the economic contribution to the region and offer new recreational fishers a unique opportunity to have a positive fishing experience.



## 7. Responsible recreational fishing



### Recreational fishers adopting and promoting responsible fishing practices

Recreational fishers have an interest in and responsibility for helping look after fisheries resources and waterways for the benefit of the environment and future generations of recreational fishers. Adopting responsible fishing practices while out on the water will help sustain and improve fisheries and continue social licence for recreational fishing. There are several ways in which recreational fishers can demonstrate responsible fishing behaviours, including:

- participating in fishery management initiatives, including advocating and caring for fish and waterways
- respecting other land and water users
- being positive role models for younger recreational fishers
- applying sustainable fishing practices and attitudes
- complying with fisheries regulations and environmental laws
- engaging in safe fishing practices, including complying with marine safety laws
- treating fish humanely.

By fishing responsibly, recreational fishers foster ongoing approval and acceptance of their sport by the broader community and other stakeholders. Similarly, responsible fishing practices are essential for maintaining access to fishing opportunities and waters.



## 7.1 Environmental stewardship and volunteerism

### **Priority: Supporting and encouraging opportunities for angler environmental stewardship and volunteerism**

Environmental health has a huge influence on the condition of our freshwater fisheries resources, and recreational fishers understand this. This is why more and more Victorian recreational fishers are advocating for healthier waterways and volunteering their time to help rehabilitate fish habitats. Recreational fishers also care for non-recreational angling species and other animals and plants that live in freshwater environments, including threatened species like the spotted tree frog (*Litoria spenceri*), barred galaxias (*Galaxias fuscus*) and Australian grayling (*Prototroctes maraena*). Increasingly, recreational fishers actively support environmental projects, help with research and monitoring, educate other water users, contribute to fish conservation programs, and participate in on-ground works. Many recreational fishers recognise the connections between fish, water and land, and support a holistic approach to ecosystem management.

Volunteering time to environmental stewardship activities not only improves fish habitat and fishery performance over time, but being involved and able to 'give something back' provides great satisfaction. Recreational fishers enjoy a sense of achievement and camaraderie by working together to improve the look and feel of the places they fish, while repairing environments for future generations. Undertaking such activities also provides an opportunity for people to share knowledge and learn new skills. Recreational fishers are one of the largest user groups of our waterways, and working together they can leverage government support and secure co-investment by supporting Recreational Fishing Licence grant projects.

It is important that environmental stewardship and volunteerism programs are recognised and encouraged by natural resource management agencies. The Victorian Fisheries Authority will work with VRFish, Native Fish Australia, the Australian Trout Foundation, Futurefish, Fishcare Victoria, recreational fishers, and land and water managers to find pathways for recreational fishers to get more involved, for example, through the Angler Riparian Partnerships Program.

There are opportunities to build the knowledge, capacity and skills of recreational fishing organisations so they can better identify, influence and facilitate on-ground river health restoration works.





## 7.2 Encouraging recreational fisher participation

### **Priority: Continuing to encourage people to participate in recreational fishing in Victoria**

Recreational fishing is important for our social and economic wellbeing. The Victorian Government's 2015–2019 *Target One Million* plan for recreational fishing aims "to get more Victorians fishing, more often" and to increase participation to one million recreational fishers by 2020. Multiple initiatives have been delivered through the 2015–2019 *Target One Million* plan, including increasing fish stocking; helping angling clubs promote membership through the Stronger Fishing Clubs grant program; opening a new trout cod fishery in Beechworth; and improving access, infrastructure and habitat through the Better Fishing Facilities fund. Numerous events have been held to engage people and educate them about recreational fishing, such as National Gone Fishing Day, the Vic Fish Kids Program, the 'Murray Codference', 'Talk Wild Trout' conferences, and the Victorian Trout Opening Festival. These events seek to include people from various demographics, age groups and locations, with the aim of encouraging lasting participation in recreational fishing. The Victorian Fisheries Authority, VRFish, Native Fish Australia, the Australian Trout Foundation, Fishcare Victoria and other partners will continue to deliver engagement initiatives, in a cost-effective manner, to engender greater interest in recreational fishing, increase participation and get more families outdoors.

The Victorian Fisheries Authority are developing stocked recreational fisheries that are close to population centres such as cities, regional centres and towns. This provides a convenient, local and low-cost opportunity for families to take their children fishing. The Victorian Fisheries Authority are also expanding the school holiday stocking program (80 waters and growing) and increasing the number of native fish to provide summer fishing opportunities.



## 7.3 Engaging the next generation

**Priority: Providing opportunities for younger people to get involved and have positive experiences**

Programs that engage children and young adults in recreational fishing are important for continuing the longevity of recreational fishing as a pastime, sustaining our fisheries resources, and promoting stewardship of aquatic environments. Victorian Fisheries Authority staff educate children and the general community through schools and at the Marine and Freshwater Discovery Centre. Complementary initiatives, like Fishcare Victoria and VRFish's Young Future Leaders Group, also raise the capacity of recreational fishing sector to understanding and influence natural resource management.

Activities within recreational fishing clubs and by Fishcare Victoria provide foundational skills for young fishers. Programs like Waterwatch, EstuaryWatch, River Detectives and Landcare are valuable for educating people about waterways and habitats. Developing and linking such programs with the Australian curriculum offers easy adoption of recreational fishing activities by schools.

Fostering the interest of young adults and children in recreational fishing is also important for developing the next generation of leaders in the recreational fishing sector, whether they be aspiring peak body leaders, fisheries managers, tackle and trade manufacturers, business owners, fish researchers, fishing celebrities, or have another profession.

The Victorian Fisheries Authority will continue work with other stakeholders to support and provide programs that educate people, both within schools and in the general community, about recreational fishing, freshwater fish and aquatic environments.







## 7.4 Promoting stewardship of fisheries resources

### **Priority: Encouraging recreational fishers to adopt responsible recreational fishing practices**

Recreational fishers and the wider community have a shared responsibility to look after fisheries resources for the benefit of the environment and for future generations of fishers.

Poor recreational fisher behaviour and unethical fishing standards can negatively influence the recreational fishing experience and the broader community perception of fishing. Examples include illegal take of fish, non-compliance with regulations, inappropriate fish handling, littering, damaging the environment, and harming non-angling species. Reduced social licence will inevitably lead to fewer recreational fishing opportunities, such as loss of access and more restrictive regulations.

Learning and following fishing regulations, only taking what you need, using the right equipment to effectively and humanely fish, taking all your litter with you, driving only on designated tracks, sharing your knowledge and skills with others, respecting our cultural heritage, engaging in safe fishing practices, and respecting the rights of other people are examples of good recreational fisher behaviours.

One way in which the Victorian Fisheries Authority aims to encourage responsible fishing practices is through partnering with Transport Safety Victoria, Life Saving Victoria, Victoria Police and land and waterway managers to promote the safe use of fisheries resources. The key aim of this approach is to reduce the number of fishing-related drowning fatalities.

Fisheries regulations are important for ensuring our fisheries resources are sustainable and accessible to the Victorian fishing community well into the future. Education and communication play a key role in ensuring regulations are effective. Increasing awareness, understanding and acceptance of fisheries regulations within the recreational fishing community will, in the long term, help increase compliance.

The community plays an important role in promoting the sustainable and responsible use of fisheries resources through the reporting of illegal fishing activity. Information provided through the 13FISH (13 3474) reporting line helps Fisheries Officers gather intelligence that assists in planning patrols and enforcement operations when no immediate field response is possible. The reporting of illegal fishing activity is a key way in which responsible fishers can demonstrate their role as guardians of the resource.

The Victorian Fisheries Authority, VRFish, Native Fish Australia, the Australian Trout Foundation, Fishcare Victoria and the broader recreational fishing community will work together to develop responsible and ethical recreational fishing codes of practice and promote their adoption.

**Let's make fishing better, for everyone.**

**VRFISH**  
VICTORIAN RECREATIONAL FISHING PEAK BODY

# RECREATIONAL FISHING CODE OF CONDUCT

**VRFISH HAS DEVELOPED THIS CODE OF CONDUCT FOR RECREATIONAL BOAT, SHORE, RIVER, STREAM AND JETTY FISHERS IN VICTORIA.**

Recreational fishers have a responsibility to look after fisheries resources for the benefit of the environment and future generations of fishers. This Code of Conduct provides guidelines to minimise conflicts on the water, demonstrate best practice for responsible fishing and result in a more enjoyable fishing experience for all.

- 1** Awareness of and compliance with fishing **REGULATIONS**.
- 2** **RESPECT** the rights of other anglers and users.
- 3** **PROTECT** and restore the environment and fish habitat.
- 4** Carefully return **UNDERSIZED**, protected or unwanted catch back to the water.
- 5** Fish species and other organisms must not be **RELOCATED**/transferred into other water bodies.
- 6** Always seek **PERMISSION** when entering private property.
- 7** Use **ESTABLISHED** access roads and tracks.
- 8** **ATTEND** to your fishing gear and value your catch.
- 9** **EDUCATION** - pass on your knowledge.
- 10** Respect Aboriginal sites, **CULTURE** and values.



[vrfish.com.au](http://vrfish.com.au)



## 7.5 Fisheries compliance

### **Priority: Communicating and enforcing fishing regulations related to sustainable and responsible fishing**

Fisheries Officers are employed by the Victorian Fisheries Authority to protect our fisheries and promote sustainable and responsible fishing. One of their roles is to ensure compliance with fishing regulations. Fisheries Officers also ensure compliance with other laws relating to responsible fishing, including environmental, fire, marine safety and land use legislation.

Fisheries Officers and other compliance staff are involved in a range of activities, including inspections, education, advocacy programs, and prosecutions. They are at the forefront, engaging with recreational fishers every day when out on the water, at recreational fishing-related shows, at family fishing events, at forums and clinics, attending angling club meetings and attending fish stocking events. In the 2016–2017 period, Fisheries Officers and staff made over 51,800 total contacts with recreational fishers, of which compliance contacts in freshwater accounted for about 14,200 contacts and education over 5,100 contacts. Fisheries Officers also work closely with other agencies such as Victoria Police when necessary. Significant revenue from recreational fishing licence fees supports the fisheries compliance budget each year.

In addition to regularly patrolling waterways to conduct recreational fishing inspections, the Victorian Fisheries Authority conduct targeted operations to address recreational fishing non-compliance hot-spots, as well as recidivist offenders and more serious non-compliance. Tactical operations at particular locations involve bringing in resources from other areas to help local Fisheries Officers target compliance risks or manage increased fishing pressure, such as season opening weekends.

Investigators from the Statewide Investigations Group and regionally based Fisheries Officers aim to reduce opportunities for recidivist offenders and more serious non-compliance through intelligence-led surveillance and investigations. This includes targeting the black market at both the source and the wholesale and retail market place.

To create an effective deterrent against non-compliance, the Fisheries Act has a number of sanctions available for dealing with breaches, including:

- infringement notices (on-the-spot fines) for minor breaches
- court imposed fines and, for more serious breaches, imprisonment
- seizure and forfeiture of equipment, including boats and vehicles
- court imposed fishing prohibitions.



## 8. Delivering the Plan



### 8.1 Implementing the Plan through partnerships

**Priority: Adopting a partnership approach to implementing the Freshwater Fisheries Management Plan, with oversight from a working group**

The Freshwater Fisheries Management Plan was prepared in accordance with the requirements of the Fisheries Act and the published Ministerial guidelines (Appendix 4), and with the assistance of a stakeholder- and expert-based Steering Committee (Appendix 5).

A key measure of the success of this Plan will be the extent to which its priorities are supported and implemented by the Victorian Fisheries Authority, recreational fishers, Traditional Owners and other government agencies. Everyone can play a role in managing Victoria's freshwater fisheries and freshwater environments. The Victorian Government and community already have strong collaborations seeking to achieve positive recreational fisheries outcomes; we want to continue to build on this approach into the future.

While the Freshwater Fisheries Management Plan does not prescribe actions, it is intended to encourage investment in projects that deliver positive outcomes for its key priorities. Importantly, to be effective this Plan requires a partnership approach.



Implementation of the Plan will require clear roles and responsibilities for relevant government agencies, organisations and other partners. This is critical for delivering outcomes, avoiding confusion, minimising duplication and inaction, and achieving value for money. To achieve ownership of the Plan and guide its delivery across Victoria, a Freshwater Fisheries Management Plan working group will be established, with participation drawn from:

- the Victorian Fisheries Authority
- VRFish, the key recreational fishing representative group
- other native and trout recreational fishing expertise
- Victorian Traditional Owners
- the Water and Catchment Group of the Department of Environment, Land, Water and Planning
- catchment management authorities
- freshwater ecology expertise from the Applied Aquatic Ecology section at the Arthur Rylah Institute.

Terms of reference will be developed for the working group, who will prepare an implementation plan that shows how key priorities will be delivered, and who will lead and support each priority and over what time frame.

The working group may also invite other prospective investment partners to participate in meetings and discuss collaborative project ideas, for example, representatives of Parks Victoria, water corporations and local councils. To ensure we encourage a statewide approach across all catchment management authority and Melbourne Water regions, the Victorian Waterway Managers' Forum will be used as a key reference group.

To ensure multiple interests work together to support healthy recreational fisheries through environmental rehabilitation efforts, the Victorian Fisheries Authority will partner with other organisations and interest groups to establish a Fish Habitat and Flows Roundtable.

To promote implementation of the Plan with key partners and recreational fishers, the Victorian Fisheries Authority will use social media platforms to brand Freshwater Fisheries Management Plan outcomes and link them to user groups to celebrate projects delivered under the Plan.

## 8.2 Evaluating the Plan

### **Priority: Establishing a transparent evaluation process to report on progress towards delivering the Plan**

This management plan will come into effect following a declaration by the Minister for Agriculture after considering the outcomes of a public consultation process. The Victorian Fisheries Authority will establish the working group and develop a framework for monitoring and reporting on activities, outputs and outcomes of the Plan. Implementation of the Plan will be regularly evaluated, and a report on its progress will be developed for a mid-point 5-year review. The review will provide transparency and enable lessons learned to be fed back into the implementation to ensure an adaptive management approach.

Separate to this, a technical review of fishery monitoring data will be conducted in Year Five of the Plan. That review will be used to inform the development of a freshwater fisheries harvest strategy.





## Case study Your licence fees at work



We are fortunate in Victoria when it comes to recreational fishing and the way it is licensed, because all the money received from the sale of fishing licences goes into a dedicated trust account, not into consolidated revenue. That is very rare in government and is a credit to the recreational fishers and fisheries managers who worked with the Victorian Government back in 1999 to introduce the 'all-waters' licence.

Every year, millions of dollars are available through the trust account to fund worthwhile projects that improve recreational fishing opportunities. Such initiatives focus on four key areas: fishing access and facilities; sustainability and habitat rehabilitation; research and monitoring; and education, information and training. Licence fees also partly pay for fish stocking, help produce fish at the Snobs Creek Hatchery and fund extra Fisheries Officers across Victoria.

The Recreational Fishing Large Grants Program is open to applications for several months each year. Statutory bodies and government agencies, incorporated bodies and associations can apply for up to \$100,000 to deliver projects that really make a difference to grass-roots anglers. Preference is given to projects that leverage off other projects, or have financial co-funding or in-kind contribution. For example, the 2013–2014 Large Grants Program provided a total of \$800,000 for seven habitat rehabilitation projects, supplemented by a \$1.2 million co-contribution by catchment management authorities.

A Small Grants Program is open to funding applications all year round, and up to \$5000 is available for small recreational fishing projects, like 'come and try' fishing days.

Since 1999, more than \$90 million has been raised from the sale of fishing licences in Victoria. The Large Grants Program has funded 326 projects, and more than 300 projects have been funded through the small grants program. And all these projects are about making your licence fees work to improve your recreational fishing outcomes!



# Appendix 1

## Listed threatened freshwater fish, crustaceans and invertebrates in Victoria

Common name	Species name	EPBC Act#	FFG Act^	DSE Advisory Lists*
<b>Fish</b>				
Australian grayling	<i>Prototroctes maraena</i>	VU	L	V
Australian mudfish	<i>Neochanna cleaveri</i>		L	CE
Australian whitebait	<i>Lovettia sealii</i>		L	CE
Barred galaxias	<i>Galaxias fuscus</i>	EN	L	CE
Cox's gudgeon	<i>Gobiomorphus coxii</i>		L	E
Dargo galaxias	<i>Galaxias mungadhan</i>		L	CE
Dwarf galaxias, eastern dwarf galaxias	<i>Galaxiella pusilla</i>	VU	L	E
East Gippsland galaxias	<i>Galaxias aequipinnis</i>		L	E
Empire gudgeon	<i>Hypseleotris compressa</i>		L	V
Flathead galaxias	<i>Galaxias rostratus</i>	CE		V
Flinders pygmy perch (east from LaTrobe River)	<i>Nannoperca sp.</i>			V
Freshwater catfish	<i>Tandanus tandanus</i>		L	E
Freshwater herring	<i>Potamalosa richmondia</i>		L	RE
Golden perch	<i>Macquaria ambigua</i>			NT
Macquarie perch	<i>Macquaria australasica</i>	EN	L	E
McDowall's galaxias	<i>Galaxias mcdowalli</i>		L	CE
Murray cod	<i>Maccullochella peelii</i>	VU	L	V
Murray hardyhead	<i>Craterocephalus fluviatilis</i>	EN	L	CE
Murray–Darling rainbowfish	<i>Melanotaenia fluviatilis</i>		L	V
River blackfish upper Wannon River form	<i>Gadopsis marmoratus upper Wannon</i>			CE
Roundsnout galaxias	<i>Galaxias terenasus</i>		L	E
Shaw galaxias	<i>Galaxias gunaikurnai</i>		L	CE
Silver perch	<i>Bidyanus bidyanus</i>	CE	L	V
Southern purple-spotted gudgeon	<i>Mogurnda adspersa</i>		L	RE
Southern pygmy perch (upper Murray River to Avoca River)	<i>Nannoperca australis</i>			V
Tapered galaxias	<i>Galaxias lanceolatus</i>		L	CE
Trout cod	<i>Maccullochella macquariensis</i>	EN	L	CE



Common name	Species name	EPBC Act#	FFG Act^	DSE Advisory Lists*
Unspecked hardyhead	<i>Craterocephalus stercusmuscarum subsp. fulvus</i>		L	
Variigated pygmy perch	<i>Nannoperca variegata</i>	VU	L	V
West Gippsland galaxias	<i>Galaxias longifundus</i>		L	CE
Western Plains galaxiella (Corangamite Basin westward)	<i>Galaxiella sp.</i>			V
Yarra pygmy perch	<i>Nannoperca obscura</i>	VU	L	V
<b>Crustaceans</b>				
Alpine spiny cray	<i>Euastacus crassus</i>		L	E
Clayton's spiny cray	<i>Euastacus claytoni</i>			V
Curve-tail burrowing crayfish	<i>Engaeus curvisuturus</i>		L	E
Dandenong burrowing crayfish	<i>Engaeus urostrictus</i>		L	CR
Dandenong freshwater amphipod	<i>Austrogammarus australis</i>		L	E
East Gippsland spiny cray	<i>Euastacus bidawalus</i>			V
Eastern freshwater shrimp	<i>Australatya striolata</i>		L	V
Foothill burrowing cray	<i>Engaeus victoriensis</i>			E
Gippsland burrowing cray	<i>Engaeus hemicirratulus</i>			E
Glenelg spiny cray	<i>Euastacus bispinosus</i>	EN	L	E
Hairy burrowing cray	<i>Engaeus sericatus</i>			V
Lilly Pilly burrowing cray	<i>Engaeus australis</i>			V
Mallacoota burrowing crayfish	<i>Engaeus mallacoota</i>		L	V
Murray spiny cray	<i>Euastacus armatus</i>		L	NT
Narracan burrowing crayfish	<i>Engaeus phyllocercus</i>		L	E
Orbost spiny cray	<i>Euastacus diversus</i>		L	E
Otway burrowing cray	<i>Engaeus fultoni</i>			V
Otways cray	<i>Geocharax gracilis</i>			E
Portland burrowing cray	<i>Engaeus strictifrons</i>			V
Sherbrooke amphipod	<i>Austrogammarus haasei</i>		L	V
South Gippsland spiny cray	<i>Euastacus neodiversus</i>		L	E
Strzelecki burrowing crayfish	<i>Engaeus rostrigaleatus</i>		L	E
Tubercle burrowing cray	<i>Engaeus tuberculatus</i>			E
Variable spiny cray	<i>Euastacus yanga</i>			V
Warragul burrowing crayfish	<i>Engaeus sternalis</i>		L	CR
Western burrowing cray				E
Western cray	<i>Geocharax falcata</i>			E
Western swamp crayfish	<i>Gramastacus insolitus</i>		L	CR



Common name	Species name	EPBC Act#	FFG Act^	DSE Advisory Lists*
<b>Molluscs</b>				
Dairy Creek Austropyrgus snail	<i>Austropyrgus grampianensis</i>		L	CR
Glenelg freshwater mussel	<i>Hyridella glenelgensis</i>	CE	L	CR
River snail species	<i>Notopala sublineata</i>		L	CR
<b>Community</b>				
Lowland riverine fish community of the Southern Murray–Darling Basin			L	

# EPBC Act: *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)

Categories: CE critically endangered, EN endangered, VU vulnerable

Source: [http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=fauna#fishes\\_critically\\_endangered](http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=fauna#fishes_critically_endangered) (accessed 4 June 2018).

^ FFG Act: *Flora and Fauna Guarantee Act 1988* (Vic.)

Category: L listed as threatened

Source: Department of Environment, Land, Water and Planning, *Flora and Fauna Guarantee Act 1988* (Vic.), Threatened list, April 2018

[https://www.environment.vic.gov.au/\\_\\_data/assets/pdf\\_file/0024/115827/FFG-Threatened-List.doc.pdf](https://www.environment.vic.gov.au/__data/assets/pdf_file/0024/115827/FFG-Threatened-List.doc.pdf), (accessed 4 June 2018).

\*DSE Advisory Lists

Categories: RE regionally extinct, CE critically endangered, E endangered, NT near threatened, V vulnerable

Source: Department of Sustainability and Environment, Advisory List of Threatened Vertebrate Fauna 2013 ([https://www.environment.vic.gov.au/\\_\\_data/assets/pdf\\_file/0014/50450/Advisory-List-of-Threatened-Vertebrate-Fauna\\_FINAL-2013.pdf](https://www.environment.vic.gov.au/__data/assets/pdf_file/0014/50450/Advisory-List-of-Threatened-Vertebrate-Fauna_FINAL-2013.pdf)) and Advisory List of Threatened Invertebrate Fauna in Victoria 2009 ([https://www.environment.vic.gov.au/\\_\\_data/assets/pdf\\_file/0016/50452/Advisory\\_List\\_of\\_Threatened\\_Invertebrate\\_Fauna\\_2009\\_FINAL\\_Sept\\_2009.pdf](https://www.environment.vic.gov.au/__data/assets/pdf_file/0016/50452/Advisory_List_of_Threatened_Invertebrate_Fauna_2009_FINAL_Sept_2009.pdf)), accessed 4 June 2018.



## Appendix 2

# Key recreational fishing species



### A brief overview of the key recreational fish species considered in the Freshwater Fisheries Management Plan



#### Murray cod (*Maccullochella peelii*)

Murray cod is Australia's largest native freshwater fish and occurs naturally in the rivers and lakes of the upper reaches of the Murray–Darling River system. Murray cod are generally found in or near relatively deep water and prefer habitats including rocks, large wooden snags, smaller woody habitat, undercut banks and overhanging vegetation. Murray cod spawn in spring and early summer. They are highly fecund and larger females lay up to 200,000 eggs. Murray cod display strong site fidelity, except before the spawning period, when adults migrate large distances upstream to spawn, after which they return downstream to their home. Murray cod are a top predator and eat fish, shrimp, crayfish, insects, molluscs, frogs, etc.

Although there are still good populations of Murray cod, and their range has remained relatively constant, the species has undergone an extensive decline in abundance since European settlement. Causes for the decline include habitat loss and degradation, pollution, barriers to fish passage, water flow regulation, cold-water releases from dams, predation of young fish, and fishing. Anecdotal reports suggest that Murray cod populations have recovered in some areas, despite environmental pressures and increasing popularity within the recreational fishing sector.

Under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), Murray cod is a threatened species and also forms part of the threatened 'Lowland Riverine Fish Community of the Southern Murray–Darling Basin'. Murray cod is a vulnerable species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). A state action statement and national recovery plan have been prepared for Murray cod. Murray cod is also classified as critically endangered in The International Union for Conservation of Nature (IUCN) Red List of Threatened Species™ (The IUCN Red List).

Recreational take of Murray cod is subject to bag, minimum and maximum legal size limits, a closed season and an absolute statewide possession limit.

The Victorian Fisheries Authority breed Murray cod at the Snobs Creek Hatchery; they are a key species in Victoria's annual native fish stocking program. Between 2010 and 2016, more than 5,154,000 Murray cod were stocked in Victoria to restore existing populations and establish new recreational fishing populations.

### Trout cod (*Maccullochella macquariensis*)

Trout cod naturally occur in the Murray–Darling Basin. They were once widespread in north-central and north-eastern Victorian streams flowing into the Murray River, including the Goulburn, Broken, Campaspe, Ovens, King, Buffalo and Mitta Mitta rivers. The species has suffered extensive population decline over most of its former known range and was in danger of extinction. Fishing pressure, impacts from introduced trout and redfin, and habitat damage and fragmentation have contributed to the decline of trout cod.



Today, the largest natural population of trout cod currently occurs in the Murray River between Yarrawonga and Barmah. A viable translocated population occurs in Sevens Creek near Euroa. Self-sustaining populations have been re-established in the Ovens and Goulburn rivers as a result of a long-term stocking program under the National Trout Cod Recovery Plan. Trout cod have also been stocked into Lake Sambell and Lake Kerferd in north-eastern Victoria to establish recreational fisheries for the species. Over 45,000 trout cod fingerlings have been stocked in the lakes since 2008, and the fisheries were opened to recreational take in August 2015.

Trout cod are a large-bodied species and can live for over 20 years. They occupy a range of habitats, but prefer deeper, fast-flowing water with rocky or gravel bottoms and are strongly associated with woody debris. Trout cod spawn in mid-October to mid-November. Females lay up to 11,000 eggs on hard substrates. Trout cod display strong site fidelity and have a home range of up to 300 metres. They are most active during periods of low light, in early morning and evening. Trout cod are carnivores, eating fish, yabbies, insects and shrimp.

Under the FFG Act, Trout cod is listed as a threatened species and also forms part of the threatened 'Lowland Riverine Fish Community of the Southern Murray–Darling Basin'. Trout cod is listed as endangered under the EPBC Act and in The IUCN Red List. A state action statement was first published for trout cod in 1993, and there have been three national recovery plans since the 1990s.



Fishing for trout cod is subject to strict regulation. The taking or possession of trout cod is prohibited in Victoria, except for in Lake Sambell and Lake Kerferd. Trout cod inadvertently caught in all other waters must be immediately returned to the water with the least possible damage or injury. Minimum and maximum legal size and a bag limit apply for trout cod in Lake Sambell and Lake Kerferd. It is easy to mistake a trout cod for a Murray cod (and vice versa) because they look similar. The Victorian Fisheries Authority promotes awareness of the key distinguishing features of trout cod and Murray cod to help people tell the difference between these species.

The Department of Environment, Land, Water and Planning has been conducting long-term research on trout cod. The Victorian Fisheries Authority breeds the species at its Snobs Creek Hatchery and is interested in increasing their production. Around 95,000 trout cod have been stocked into Victorian waters between 2010 and 2016 to aid the species' recovery and support the species' recreational fisheries in Lake Sambell and Lake Kerferd.



### Golden perch (*Macquaria ambigua*)

Golden perch are a long-lived, large-bodied species that occur naturally in the Murray–Darling Basin. Golden perch prefer warm, turbid, slow-flowing streams, but also occupy fast-flowing streams, rivers, floodplains and backwaters. They are often found among cover, near in-stream structures and in deeper water.

Golden perch are highly fecund: a 2.3 kilogram female produces up to 500,000 eggs. Females spawn in spring and summer, when water levels and water temperatures increase. Golden perch are highly mobile. They display strong site fidelity and occupy restricted ranges for extended periods, before moving large distances to congregate and breed. Golden perch are carnivores and feed on fish, crustaceans and insects.

Golden perch forms part of the threatened 'Lowland Riverine Fish Community of the Southern Murray–Darling Basin' listed in the FFG Act.

Recreational take of golden perch is subject to a bag limit and a minimum legal size limit.

Golden perch is a significant component of Victoria's annual native fish stocking program, and large numbers are purchased each year from commercial fish farms in order to stock rivers and lakes, to restore existing populations, and to establish new recreational fishing populations. Between 2010 and 2016, more than 8,175,000 golden perch were stocked into the waterways and impoundments in Victoria. Aggressive stocking of golden perch into Lake Eildon and Lake Nagambie has resulted in the development of healthy, popular fisheries for the species.

### Macquarie perch (*Macquaria australasica*)

Macquarie perch are endemic to the Murray–Darling Basin and three coastal basins in New South Wales. In Victoria, Macquarie perch historically occurred in the Upper Murray, Kiewa, Ovens, Broken, Goulburn, Campaspe and Loddon river basins. Their natural range has declined to a handful of small, fragmented populations in the Upper Murray, Ovens, Goulburn, Broken and Campaspe river basins. Factors contributing to their decline include changes in river flows and temperature regimes, loss of in-stream habitat, silting of spawning areas, barriers to fish passage and the impacts of introduced species such as trout and redfin.

Macquarie perch are found in cool waters, deep pools, and among woody debris, rocky habitat and overhanging vegetation. Macquarie perch spawn in late spring and early summer when water temperatures exceed 16°C. Adults congregate to breed. Spawning sites are at the base of pools, and the eggs drift downstream and lodge among rocks in runs and riffles. Macquarie perch are most active from dusk to dawn. They display site fidelity, occupy a small home range, and undertake limited movements over larger distances. Macquarie perch feed on insects, shrimp, crayfish, molluscs and small fish.

Under the FFG Act, Macquarie perch is listed as a threatened species and also forms part of the threatened 'Lowland Riverine Fish Community of the Southern Murray–Darling Basin'. Macquarie perch is also an endangered species under the EPBC Act. A draft state action statement exists for Macquarie perch, and a draft national recovery plan was recently made available for public comment.

Recreational take of Macquarie perch is only authorised from Lake Dartmouth, the Yarra River and the Upper Coliban Reservoir (and their tributaries)—a bag limit, minimum legal size limit and a closed season apply. The taking of Macquarie perch is prohibited in all other waters.

The Victorian Fisheries Authority is keen to expand its fish production capabilities for Macquarie perch at their Snobs Creek Hatchery, in collaboration with other organisations and investment partners. There is a long history of Macquarie perch stock enhancements and translocations in Victoria, including establishing a self-sustaining population in the Yarra River catchment. Adult Macquarie perch are currently collected from Lake Dartmouth and the Yarra River, with the help of Native Fish Australia, for hatchery breeding and stocking into Victorian waterways, to aid the species' recovery and to develop recreational fisheries for this species in the future. In the period 2010–2016, over 151,800 Macquarie perch were stocked into Victorian waters. As the remaining populations of Macquarie perch have low genetic diversity and effective population sizes, additional small-scale translocations may help improve their genetic diversity and resilience.





### Silver perch (*Bidyanus bidyanus*)

Silver perch are endemic to the Murray–Darling Basin. In Victoria, they naturally occur in the Upper Murray, Kiewa, Ovens, Broken, Goulburn, Campaspe, Loddon, Mallee and Murray–Riverina basins. Silver perch were once widespread and abundant, but they have declined to low numbers and disappeared from much of their native range. The current stronghold population occurs between Yarrawonga and Euston. The decline of silver perch in Victoria is most likely a result of barriers to fish passage, river regulation, thermal pollution, and the impacts of introduced species. They have also been introduced outside their native range to the Yarra, Wimmera, Werribee and Corangamite basins.

Silver perch are large-bodied and long-lived. They occupy fast- and slow-flowing rivers with gravel and sandy substrates. They prefer open water rather than in-stream cover. Silver perch breed in spring and summer, following an upstream migration, and large schools can form. Females produce around 300,000 eggs, though fecundity varies with fish size. Silver perch are highly mobile and move large distances.

Under the FFG Act, silver perch is listed as a threatened species and also forms part of the threatened 'Lowland Riverine Fish Community of the Southern Murray–Darling Basin'. Silver perch is also a critically endangered species under the EPBC Act. A state action statement exists for silver perch, as well as a recovery plan for silver perch in the Murray–Darling Basin. Silver perch is also classified as vulnerable in The IUCN Red List.

Subject to bag and size limits, recreational take of silver perch is restricted to lakes and impoundments north of the Great Dividing Range excluding the Wimmera Basin, and to all waters south of the Great Dividing Range, including the Wimmera Basin.

Silver perch are stocked into some Victorian rivers and impoundments. Nearly 250,000 silver perch were stocked from 2010 to 2016.



### Freshwater catfish (*Tandanus tandanus*)

Freshwater catfish is native to the Murray–Darling Basin and coastal drainages from central New South Wales to northern Queensland. In Victoria, Freshwater catfish is naturally found in the Upper Murray, Ovens, Broken, Goulburn, Campaspe, Loddon, Avoca and Mallee river basins. They have been introduced into the Wimmera, La Trobe, Richardson and Yarra rivers (all outside their natural range) and several lakes. Although common in some areas, their historical distribution and abundance have been diminished. Their key threats include impacts from introduced species, loss of in-stream and floodplain habitats, changes to water flows, and sedimentation.



Freshwater catfish are found in rivers, creeks, lakes and billabongs. They prefer slow or still water with extensive in-stream cover in the form of woody debris and aquatic plants. Freshwater catfish spawn in spring and summer.

Individuals form pairs prior to spawning, and construct nests within which they lay their eggs. Fecundity increases with fish size, with females producing 2000–20,000 eggs. Freshwater catfish are nocturnal. They typically have limited home ranges and only occasionally move greater distances, such as between riverine and floodplain habitats. Freshwater catfish are bottom-feeders and eat insects, snails, worms, shrimps, yabbies and small fish.

Freshwater catfish are listed as threatened species under the FFG Act and also form part of the threatened 'Lowland Riverine Fish Community of the Southern Murray–Darling Basin'. A state action statement and a recovery plan for freshwater catfish within the Murray–Darling Basin have been prepared.

Recreational take of freshwater catfish is prohibited in all parts of Victoria except the Wimmera Basin. Bag and minimum legal size limits apply for freshwater catfish in the Wimmera Basin.

The Victorian Fisheries Authority has trialled breeding of freshwater catfish and is interested in establishing a formal breeding program to aid the species' recovery and expand the recreational fishery. Nearly 2500 freshwater catfish were stocked into Victorian waters between 2010 and 2016.



### River blackfish (*Gadopsis marmoratus*)

River blackfish are endemic to south-eastern Australia and are widely distributed throughout Victoria. River blackfish grow up to 60 centimetres long in coastal catchments, whereas they rarely exceed 30 centimetres in catchments north of the Great Dividing Range. Recent genetic analysis has revealed that river blackfish in Victoria represent five candidate species, and taxonomic work is continuing in the process of formally describing them as valid species.

River blackfish occupy clear flowing streams, slow-flowing lowland rivers, lakes and reservoirs. They are habitat specialists and prefer cover, woody debris, rocky substrates and undercut banks. They are often located in pools, but also use riffle and run habitats. River blackfish spawn from late spring to summer in response to increasing water temperature. Fecundity is low and increases with body length; they generally produce 300–500 eggs. Eggs are laid in hollow logs and possibly gravel beds, on rocky crevices and below undercut banks.

River blackfish are nocturnal. They have small home ranges (less than 30 metres) and seldom disperse large distances. This makes it difficult for river blackfish to expand, to recolonise areas and to disperse to seek refuge or escape unfavourable conditions. River blackfish are opportunistic carnivores and feed on a variety of insects, molluscs, crayfish and smaller fish.

Long valued as a food resource by Aboriginal peoples and European settlers, river blackfish continue to be popular recreational fish. However, river blackfish have slowly declined in range and abundance since the early 1900s. Many populations now consist of larger, older individuals, with fewer new recruits. Habitat degradation, climate change impacts, reduced stream flows and sustained angling pressure have contributed to their decline. Early attempts to breed blackfish are being investigated by Native Fish Australia members.



### Estuary perch (*Macquaria colonorum*)

Estuary perch are found in coastal waterways throughout Victoria. They were historically abundant in Port Phillip and Western Port, but are now less common in these areas. Estuary perch are estuarine residents and are occasionally found in freshwater reaches, particularly in western Victorian catchments such as the Glenelg River. Salinity, water temperature and river flows influence their distribution within estuaries. Their key threats include barriers to passage, altered natural flows and climate change.

Estuary perch can grow to 75 centimetres and 10 kilograms, but are usually much smaller (from 400 grams to 2 kilograms). They spawn in winter and spring in water temperatures of 14–19°C. Spawning usually begins later in western estuaries than in the east. Females produce many eggs, and

fecundity increases with fish length. Eggs are laid onto rocky reefs and seagrass beds. At other times of the year, estuary perch occupy a wide variety of habitats, including deep channels, shallow mud-bottomed habitat, and woody structures. Estuary perch are highly mobile and are more active at night. They migrate from the upper estuary to spawn in the lower estuary, before returning to the upper estuary. Estuary perch are ambush feeders and consume small fish, shrimps, prawns, worms and molluscs.

Recreational take of estuary perch is subject to minimum legal size and bag limits.

Since 2012, about 408,000 estuary perch have been stocked into Victorian waters. Estuary perch are produced in a commercial hatchery using broodstock from Victorian waters. Broodstock collection and the breeding program are closely managed because estuary perch populations across Victoria have considerable genetic differences, and estuary perch and Australian bass can hybridise.

### Australian bass (*Macquaria novemaculeata*)

Australian bass naturally occur in coastal catchments from south Queensland to Wilsons Promontory in Gippsland, Victoria. Abundances of Australian bass in Victoria have declined throughout their range. Key threats include barriers to fish passage, flow alteration and climate change.

Australian bass are a large-bodied, long-lived species. They spend most of their time in freshwater and migrate downstream to the mid and lower reaches of estuaries to breed. Australian bass spawn from June to September in water temperatures of 14–20°C and water salinities of 12,000–15,000 parts per million. Their preferred habitats include deeper waters, edge habitats, overhanging vegetation, boulders, bedrock and gravel substrates. Australian bass are a highly mobile species and are generally more active at night. They occupy temporary home ranges in fresh water for prolonged periods and readily move between fresh water and the estuary to breed. Australian bass are carnivorous, feeding in estuaries mainly on shrimp, small crabs, worms and smaller fish. In fresh water, a large proportion of their diet comprises terrestrial insects, but they also feed on aquatic insects, shrimps, tadpoles and small fish.

Australian bass are highly regarded by anglers and require a good deal of finesse to catch with any regularity. Recreational take of Australian bass is subject to minimum legal size and bag limits. Australian bass are commonly confused with estuary perch as they look similar. The Victorian Fisheries Authority promotes awareness of the key distinguishing features for Australian bass and estuary perch to help people recognise the different species.





Australian bass have been stocked into several rivers and impoundments in the Gippsland region, as well as into Lake Bullen Merri in south-western Victoria. Stocking programs occurred in 2002 and 2003, and recommenced in 2009. Nearly 620,000 Australian bass have been stocked over 2010–2016. Several Australian bass have been taken from the Yarra River, Lake Eppalock and the Goulburn River as a result of illegal stocking.



### Murray spiny crayfish (*Euastacus armatus*)

The Murray spiny crayfish is endemic to waterways of the southern Murray–Darling Basin, ranging from central and southern New South Wales to northern Victoria. Murray spiny crayfish have undergone declines in range and abundance; they maintain a broad but patchy distribution in Victoria.

The Murray spiny crayfish is considered to be the second-largest freshwater crayfish species in the world. Adults commonly exceed 20–30 centimetres in length and can weigh up to 2 kilograms. Murray spiny crayfish generally prefer well-oxygenated water and are often found in cooler, faster-flowing mountain streams and rivers. They use log and rocks for in-stream shelter and clay riverbanks for burrowing. Murray spiny crayfish are long-lived and slow-growing, and reach sexual maturity at about 9 years. They spawn annually in winter to spring. They do not disperse far and have small home ranges.

The Murray spiny crayfish is listed as a threatened species under the FFG Act, and a state action statement for the species was prepared in 2003.

Recreational take of Murray spiny crayfish is subject to a bag limit, minimum and maximum legal size limits, a closed season, an absolute statewide possession limit, and collection method regulations. It is prohibited to possess any female freshwater crayfish with eggs, with young attached, or to remove their eggs.



### Common yabby (*Cherax destructor*)

Common yabbies are widespread and common throughout Victoria. They occupy various environments, such as rivers, streams, reservoirs and wetlands, at medium to low elevations. They are generally found in well-oxygenated waters, in areas with muddy or silted bottoms, and where there is plenty of vegetation and in-stream cover. They have broad temperature, oxygen and temperature tolerances and can survive dry conditions for extended periods by lying dormant in deep burrows.

Reproduction in common yabbies is primarily related to water temperature and day length. Mating begins in spring and early summer. Common yabbies are largely nocturnal and are most active around dawn and dusk. They do not disperse far and have small home ranges. The common yabby is omnivorous, but primarily vegetarian, favouring rotting leaves and plants.

Recreational take of common yabby is subject to a bag limit, an absolute statewide possession limit and collection method regulations. Berried female yabbies must be returned to the water.

### Brown trout (*Salmo trutta*)

Brown trout is native to the cool and cold waters of Europe, and was introduced to Australia in the 1860s from Scotland as a recreational sport fish. Its distribution has increased through a combination of translocation and migration.

The ideal habitats for this species are cool, well-oxygenated waters, such as rivers and streams with moderate to fast flow. The most suitable waterways tend to exist in mountainous areas and feature adequate cover in the form of submerged rocks, undercut banks and overhanging vegetation. Brown trout are also supported by impoundments where suitable water quality, habitat and food exist. They are highly predatory and impact smaller native fish. They feed on aquatic and terrestrial insects, molluscs, crustaceans and small fish.

Brown trout mature at 3–4 years of age. Their spawning season extends from autumn into winter. Fish migrate upstream into smaller tributaries and feeder streams, or spawn locally in resident rivers. Females use their tail to excavate depressions in the stream bed and lay an average of 1600 eggs for each kilogram of body weight.

After spawning, the eggs are covered by dislodging gravel upstream of the spawning site. Trout require a gravel substrate for the deposition of eggs to ensure sufficient oxygen supply.

In the period 2010–2016, the Victorian Fisheries Authority stocked more than 2,160,000 brown trout throughout Victoria, mainly into impoundments.

Trout fisheries are regulated by the application of a closed season for trout in rivers, streams and tailrace rivers (to protect trout during their spawning season) and bag and possession limits. Recreational fishers are currently being consulted about proposed changes to trout fisheries regulations, including the introduction of minimum size limits and reduced bag limits in four iconic trout streams and two trophy trout lakes, and the removal of the closed season for trout in two south-western Victorian rivers. It is believed that these proposed regulation changes would make for even better trout fishing in Victoria.





### Rainbow trout (*Oncorhynchus mykiss*)

Rainbow trout are native to the Pacific coast of North America. They were introduced to Australia in the 1890s from New Zealand, where they had previously been introduced from California. As was the case with brown trout, rainbow trout was introduced to satisfy a sport fishing market. Rainbow trout occupy similar habitats to brown trout, though rainbow trout tolerate slightly higher water temperatures than brown trout and tend to be more successful in lakes than in rivers and streams. Generally, when brown trout and rainbow trout are together, brown trout tend to dominate. Spawning requirements for rainbow trout are like those of brown trout, although rainbow trout spawn later in the year, during winter and early spring.

In the period 2010–2016, the Victorian Fisheries Authority stocked more than 2,280,000 rainbow trout throughout Victoria, mainly into impoundments.

Rainbow trout and brown trout have the same fisheries regulations.



### Chinook salmon (*Oncorhynchus tshawytscha*)

Chinook salmon are native to the Northern Pacific Ocean and are renowned in the rivers of the west coast of North America. They are among the largest and most highly sought-after sport fishing species in the world, with trophy fish weighing more than 50 kilograms. In the wild, Chinook salmon spend most of their 7–8-year life span in marine waters, only returning to their freshwater reaches to spawn before dying.

After many introduction attempts, Chinook salmon became successfully acclimatised to New Zealand waters in the early 1900s. They were then imported from New Zealand to Australia, but again there were difficulties, and it took many attempts to stock them in Victorian waterways before eventually a fishery was established in the mid-1900s in Victoria's Western District crater lakes—Lake Bullen Merri and Lake Purrumbete. Unlike most other Chinook salmon fisheries around the world, the crater lakes fishery is land-locked, that is, these salmon spend their entire life in fresh water. The unusually deep (50 metres plus), cold and productive waters of the crater lakes provided ideal growing conditions for our Chinook salmon fishery. In the 1970s and 1980s, our best trophy Chinook salmon in these waters grew to more than 13 kilograms.

As a cold-water species, Chinook salmon eggs are highly vulnerable to the effects of high summer water temperatures leading up to their breeding period in March. On one occasion, the entire remaining population of Chinook salmon at Snobs Creek was constrained to just a few dozen fish.



In 2010, a review of Chinook salmon production methods at Snobs Creek led to improvement in production methods, and by 2011 large-scale production had returned. Snobs Creek has the only viable population of Chinook salmon in Australia.

Since the reintroduction of Chinook salmon to the crater lakes in 2011, they have created wonderful fishing opportunities. A concerted effort to refine stocking rates, using local angling club catch data, has improved the quality of the fishery, and trophy fish are once again approaching 8 kilograms, or the old magic '20-pound' benchmark.

Under the Fisheries Regulations, up to five Chinook salmon may be taken, of which no more than two fish may exceed 35 centimetres.

### Redfin perch (*Perca fluviatilis*)

Redfin perch was introduced to Australia from Europe during the mid-nineteenth century by fish acclimatisation societies. They are widespread and abundant across Victoria and occur in a variety of waters, including in lakes, dams, billabongs, swamps and the slower-flowing reaches of rivers and streams. Redfin perch prefer lakes and slow-moving rivers with abundant weed, vegetation or other cover, such as rocks and fallen timber. Vegetation plays an important role in the life cycle of redfin perch because females spawn eggs among aquatic plants and submerged logs. Redfin perch feed on a variety of aquatic species, including molluscs, crustaceans and small fish.

Redfin perch are a popular sport fish with some anglers because of their fighting qualities and taste. However, they are also voracious predators of other fish and invertebrates, and they outcompete other angling species for food and space. In enclosed waters, they tend to build up large populations of stunted fish and can eliminate other fish species.

There are currently no minimum legal size or bag/possession limits for redfin perch. Recreational fishers are encouraged not to return redfin perch to the water and are reminded that it is illegal to transport live fish without appropriate approval from the Victorian Fisheries Authority.



## Appendix 3

# Partner organisations

Table 3. Key Victorian partner organisations who can help build better recreational fisheries

Partner	Healthy recreational fisheries	Understanding our recreational fisheries	Working with Traditional Owners and Aboriginal Victorians	Improving recreational fishing experiences	Promoting responsible fishing
Recreational fishers and organisations (e.g. VRFish, Australian Trout Foundation, Native Fish Australia, Futurefish Foundation, Fishcare Victoria)	✓	✓	✓	✓	✓
Victorian Traditional Owner Corporations and Aboriginal people	✓	✓	✓	✓	✓
Victorian Fisheries Authority	✓	✓	✓	✓	✓
Department of Environment, Land, Water and Planning	✓	✓	✓	✓	✓
Catchment management authorities and Melbourne Water	✓	✓	✓	✓	✓
Victorian Environmental Water Holder	✓	✓	✓		✓
Water corporations	✓	✓	✓	✓	
Department of Economic Development, Jobs, Transport and Resources	✓		✓		
Parks Victoria	✓		✓	✓	
Environment Protection Authority (EPA) Victoria	✓		✓		✓

# Appendix 4

## Ministerial guidelines for the Freshwater Fisheries Management Plan

### *Fisheries Act 1995 (Victoria)*

I, Travis Dowling, Chief Executive Officer of the Victorian Fisheries Authority, as delegate of the Minister for Agriculture, pursuant to section 28(2) of the *Fisheries Act 1995* (the Act), issue the following guidelines with respect to the preparation of a Freshwater Fisheries Management Plan.

1. The Victorian Fisheries Authority is responsible for preparing the Freshwater Fisheries Management Plan. The Freshwater Fisheries Management Plan will be consistent with the Act and its objectives.
2. The Freshwater Fisheries Management Plan Steering Committee will advise the Chief Executive Officer, Victorian Fisheries Authority, in preparing the Freshwater Fisheries Management Plan.
3. The Freshwater Fisheries Management Plan will recognise the ongoing economic and social importance of freshwater recreational fisheries, including Traditional Owner and conservation interests.
4. The Victorian Fisheries Authority will consult in accordance with the consultation principles in section 3A of the *Fisheries Act 1995*.
5. The Freshwater Fisheries Management Plan should seek to provide for the economic and social benefits of freshwater recreational fishing, while ensuring a responsible biological harvest and minimising ecological impacts.
6. The Freshwater Fisheries Management Plan will take into account consistency with the existing regulations and legislation.
7. The Freshwater Fisheries Management Plan will set out priorities and management arrangements for achieving the objectives.
8. The Freshwater Fisheries Management Plan will take account of the Australian Government's Guidelines for Assessing the Ecologically Sustainable Management of Fisheries.
9. The Freshwater Fisheries Management Plan will remain in place until a new Freshwater Fisheries Management Plan is declared.



# Appendix 5

## Freshwater Fisheries Management Plan Steering Committee

Membership of the Freshwater Fisheries Management Plan Steering Committee consisted of:

### **Independent Chair**

Mr Graeme Dear

### **Steering Committee members**

Mr Robert Loats, VRFish

Mr Michael Burgess, VRFish

Mr Tim Curmi, Native Fish Australia

Mr Terry George, Australian Trout Foundation

Mr Ken Stewart, Federation of Victorian Traditional Owner Corporations

Ms Amber Clarke, Department of Environment, Land, Water and Planning

Mr Jarod Lyon, Department of Environment, Land, Water and Planning

Mr Mark Turner, Goulburn Broken Catchment Management Authority

Mr Anthony Forster, Victorian Fisheries Authority

Mr Taylor Hunt, Victorian Fisheries Authority

### **Executive Officer**

Ms Renae Ayres, Victorian Fisheries Authority



# Appendix 6

## List of priorities by chapter

### 3. Healthy recreational fisheries

- Rehabilitating river habitat and improving connectivity to support healthier fish populations
- Ensuring recreational fishing values are considered in water management policy
- Expanding and improving the effectiveness of fish stocking to recover threatened species and improve recreational fisheries
- Developing and implementing statewide recovery plans for 'at-risk' fish species
- Managing noxious or pest species in freshwater environments and delivering the National Carp Control Plan in Victoria, if approved

### 4. A deeper understanding of our recreational fisheries

- Monitoring and assessing the health of recreational fish populations in selected reference rivers
- Assessing the performance of recreational fisheries by expanding the angler catch-and-effort program
- Developing a harvest strategy for selected freshwater fisheries using information from fish population health monitoring and recreational fisher feedback
- Monitoring and assessing the response of fish populations to management interventions, e.g. habitat restoration, regulations, fish stocking, etc

### 5. Working with Traditional Owners and Aboriginal Victorians

- Expanding consultation and looking for opportunities to partner with Traditional Owners and Aboriginal Victorians to deliver shared benefits

### 6. Improving recreational fishing experiences

- Protecting and facilitating recreational fisher access
- Strengthening connections between government and recreational fishers to inform fisheries management
- Promoting Victoria's premier recreational fishing destinations to encourage fishing participation and regional tourism

## 7. Responsible recreational fishing

- Supporting and encouraging opportunities for angler environmental stewardship and volunteerism
- Continuing to encourage people to participate in recreational fishing in Victoria
- Providing opportunities for younger people to get involved and have positive experiences
- Encouraging recreational fishers to adopt responsible recreational fishing practices.
- Communicating and enforcing fishing regulations related to sustainable and responsible fishing

## 8. Delivering the Plan

- Adopting a partnership approach to implementing the Freshwater Fisheries Management Plan, with oversight from a working group
- Establishing a transparent evaluation process to report on progress towards delivering the Plan





## Appendix 7

# Image acknowledgements

The images in this document have been supplied by various groups and individuals, and their contributions are gratefully acknowledged.

Page	Description	Photographer/ Source
Cover	Passionate angler John Cahill with a clear-water Murray cod.	Josh Hutchins
iv	Young flyfisher Audrey with her first rainbow trout	David Anderson
1	Murray cod populations are rebuilding, thanks to stocking, habitat restoration and changing recreational fisher attitudes.	Josh Hutchins
1	Healthy river habitats are critical in supporting healthy fisheries.	Arthur Rylah Institute
2	Recreational fishing is a terrific fun activity for the whole family.	Philip Weigall
3	Brown trout are among the most popular of our freshwater fish.	Taylor Hunt
3	Our best wild trout rivers have good streamside tree cover and shading.	Renae Ayres
4	Prospecting for trout in the high country is a magical experience.	Trevor Hawkins
4	Fishing gets you out into some beautiful landscapes.	Kristina Royter
5	Commercial eel fisher using a fyke net in inland waters	Peter Ingram
5	Yabbies are a key bait source for catching native fish.	VFA
6	Attitudes to recreational fishing are changing from large-scale harvest for food to catch and release.	Museums Victoria
6	Wholesale de-snagging of the Murray River (1894) continues to negatively impact our native fisheries.	A.J. Campbell (Photographer), Museums Victoria (Source)
7	Weirs are major barriers to fish passage and change the river flow and temperature.	Kirk Dahle
8	Livestock impact riparian zones, decrease water quality and cause siltation.	Arthur Rylah Institute
9	Declan with his 6.2 kg brown trout from Lake Purrumbete	Taylor Hunt
9	Cichlids released from home aquariums established large populations in Hazelwood Pondage.	VFA
10	VFA's education and enforcement staff interact with thousands of anglers every year.	VFA

Page	Description	Photographer/ Source
11	Fire and floods (2013) devastated fish habitat in the Upper Ovens River.	Brian Eddy
11	The Ovens River at Frosty Corner following in-stream habitat restoration works funded by recreational fishing licence fees.	Brian Eddy
12	A river brown trout on the surface looking for food.	Shutterstock
12	The once-common Macquarie perch are now restricted to a few populations.	Jarod Lyon
13	Freshwater Fisheries Manager, John Douglas, fly casting for wild brown trout.	Daniel Kent
14	Fishing is a great family experience, especially when you catch a fish.	Philip Weigall
15	Sunset over Taylors Lake, developing native fishery.	Christine O'Connell
16	Building a rock-ramp fish way to improve fish passage.	Goulburn Broken Catchment Management Authority
16	A combination of stocking and river restoration has recovered trout cod in the Ovens rivers.	Josh Hutchins
17	Hundreds of new woody homes for fish have been placed into Broken Creek and other rivers.	Goulburn Broken Catchment Management Authority
17	Restoring streamside vegetation and managing livestock access will improve our fisheries in the long-term.	Goulburn Broken Catchment Management Authority
18	Trevor Hawkins, among other trout fishers, planting trees to keep streams cool in summer.	Goulburn Broken Catchment Management Authority
19	Weirs are a major barrier to fish movement.	Goulburn Broken Catchment Management Authority
20	Innovative use of water is rebuilding native fisheries in the Gunbower and Lower Loddon waterways.	North Central Catchment Management Authority
21	The stocking of Murray cod, produced at the Snobs Creek Hatchery, has helped rebuild fisheries in many waterways.	Marc Ainsworth
22	A drone's view of our Snobs Creek hatchery	David Anderson

Page	Description	Photographer/ Source
23	Macquarie perch remain one of the most difficult native fish to breed.	David Anderson
24	Hatchery-reared and threatened freshwater catfish ready for release.	Pam Clunie
25	Steph with an impressive Ovens River trout cod	Josh Hutchins
26	Carp are a major pest species in Victoria's waterways.	Jarod Lyon
27	The National Carp Control Plan is investigating the use of carp herpesvirus to control carp populations.	Katie Howard
28	Electrofishing is a non-destructive survey method for gaining information about fish populations.	David Sikerdick
29	Backpack electrofishing is a great way to monitor fish in smaller streams.	Arthur Rylah Institute
30	Catch and effort data from recreational fishers is valuable in assessing the performance of our stocked fisheries.	Marc Ainsworth
31	Happy tournament angler, Doug Phayer, with his cracking estuary perch.	Doug Phayer
32	Recreational fishers can expect to encounter larger Murray cod as slot limit regulations protect bigger, breeding fish.	Darren Weda
33	Radiotracking technology provides information about fish movements and habitat preferences.	Fern Hames
34	Artwork from the Aboriginal Fishing Strategy.	Reanna Bono
35	Murray cod feature in many dreamtime stories of Aboriginal Communities in the Murray–Darling Basin.	Mike Gilby
35	Michael Gilby, Aboriginal Fisheries Officer, enjoys catching Murray cod.	Ray Ahmat
36	'Borpa' is the word for crayfish in the language of Yorta Yorta people.	Clive Atkinson
38	Peak hour at Lake Eildon boat ramp—Lake Eildon is our most popular impoundment, freshwater fishery.	Marc Ainsworth
38	Fishing platforms provide all-abilities access opportunities.	Marc Ainsworth
39	A simple stile over a fence helps recreational fishers to access waterways.	Marc Ainsworth
40	The Victorian Fisheries Authority's Talk Wild Trout Conference is a great way to connect with avid trout fishers.	Marc Ainsworth
41	Sarah and Soul fishing at Metung	Sarah van Stolcrom (Fishcare)
41	Fishing on ever-popular Lake Eildon.	Marc Ainsworth

Page	Description	Photographer/ Source
42	Trout fishing gets you into some wild and wonderful places.	David Anderson
43	Victoria's western district lakes are our premier stocked trout and salmon fisheries.	Mark Gercovich
44	New skills learned at workshops are practised in fishing clinics at Lillydale Lake.	Brian Mottram
44	Recreational fishers planting native trees to improve fish habitat.	Geoff Brennan
45	Trout fishers rolling up their sleeves at Snobs Creek Hatchery to help with egg incubator trials.	John Douglas
46	Lake Nagambie is emerging as a great stocked fishery.	Marc Ainsworth
46	A happy fisher releasing her brown trout.	Adam Royter
47	Your first fish is a memory that lasts a lifetime.	Daniel Kent
47	Fishing gets kids out and about and connecting with nature.	Kristina Royter
48	Anglers get a real buzz from releasing their prized catch.	Tony Haim
49	Recreational fishing code of conduct	VRFish
50	Fisheries Officers out and about educating the next generation of recreational fishers.	Anthony McGrath
51	Fish stocking is a key fishery management tool.	Victorian Fisheries Authority
51	Fishing is a great family affair.	Daniel Kent
53	Redfin perch are a popular introduced fish species.	Marc Ainsworth
53	All recreational fishing licence fees are invested in managing and developing recreational fisheries.	Marc Ainsworth
54	On-ground works to improve fish habitat, such as installing custom-built woody homes, are funded by recreational fishing licence fees.	North East Catchment Management Authority
55	A Murray River rainbow fish.	Arthur Rylah Institute
57	Trout cod are a great fighting fish that are making a comeback.	Wayne Dubois
58	Rainbow trout are among the most popular freshwater fish in Victoria	John Douglas
58	Murray cod are the iconic native species most valued by anglers.	Robbie Alexander
59	Trout cod are closely related to Murray cod and are making a comeback in the Murray and Ovens rivers.	Wayne Dubois



Page	Description	Photographer/ Source
60	Wally Cubbins, from Nagambie Angling Club, is a tireless advocate for inland fisheries and loves golden perch.	Marc Ainsworth
61	Lake Dartmouth holds one of the healthiest populations of Macquarie perch in Australia.	Marc Ainsworth
62	Silver perch are a hard-fighting fish that are now threatened.	Zeb Tonkin
63	The abundance and distribution of freshwater catfish has declined markedly over the last 50 years or so.	Justin O'Mahoney
64	River blackfish have a strong avidity for woody habitats.	Josh Hutchins
64	With the help of recreational fishers, estuary perch are now being bred and stocked in many waters in southern Victoria.	Mark Gercovich
65	Thanks to stocking and habitat restoration, Australian bass are making a comeback in Gippsland rivers.	Craig Ingram
66	Murray spiny crayfish are a popular recreational species targeted during winter in our northern rivers.	Scott Raymond
66	The common yabby is widely distributed and abundant in Victorian waterways.	Zeb Tonkin
67	A thumping brown trout from a stocked fishery in the Hopkins River.	Mark Gercovich
68	Rainbow trout perform well in recovering, drought affected lakes and family friendly small lakes.	Marc Ainsworth
68	Luke with his personal best Crater Lake Chinook salmon.	Mark Gercovich
69	Redfin perch are affectionately called 'Wimmera whiting' by some recreational fishers.	Ben Young
72	The Freshwater Fisheries Management Plan Steering Committee.	Renae Ayres
74	Giving Murray cod a helping hand through fish stocking.	VFA







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