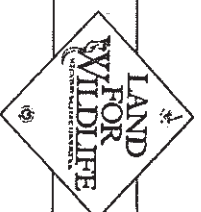


Victoria's native freshwater fish

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Unlike most other vertebrates, fish and their habitats remain largely unseen and are a hidden, but important component of the natural environment. Their general biology and ecological requirements remain a mystery to most people, while degradation of their habitat, and other threats they face, usually pass unnoticed. Any harmful actions that occur within a catchment may have a profound effect on the aquatic environment, and its fish populations.

Because angling is a major recreational activity in Victoria, most of the interest and research that exists on freshwater fish tends to focus on the larger angling species. However, the smaller native fish are just as important. Forty-five species of essentially freshwater native fish have been described in Victoria, ranging from the Murray Cod, which can grow to over one hundred kilograms and is highly prized as an angling species, to the smaller galaxias, some of which reach a maximum size of just 40 mm. Most native fish are migratory, many requiring access to an estuary or the sea as part of their life cycle. They are dependent on a system with clean water and quality habitat that will supply shelter, food, breeding sites and other habitat requirements.

Three species of native freshwater fish, which are likely to be found on private land, are profiled in this Note, as well as a discussion of threats to fish and their environments and what you can do to help conserve native fish on your property.

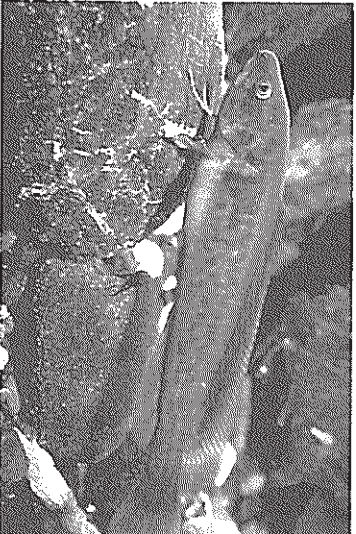
Tupong *Pseudaphritis urvillii*



Features: Small to medium-size (to 360 mm), slender fish, flathead like appearance; tubular body; somewhat compressed posteriorly; eyes set close together, almost on top of the head.
Habitat: In a variety of estuarine and riverine situations. In streams, prefers areas of slow-flowing water and is normally found amongst debris and leaf litter, or under logs and overhanging banks.
Biological notes: Males found in environments close to or under estuarine influence. Females migrate downstream towards estuary to breed. They are generalised carnivores, taking a wide range of bottom-dwelling (benthic) organisms, such as insects, worms and small fish.
Status is widespread/common.



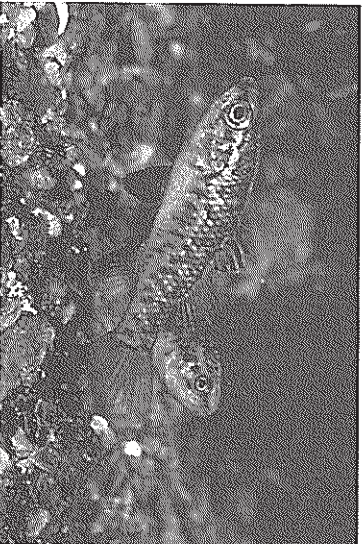
River Blackfish *Gadopsis marmoratus*



Features: Small to moderate-size (to 600mm), dark, mottled, slimy fish with elongate tapering body; single long dorsal fin.
Habitat: Preferred habitat is clear, well oxygenated, flowing streams with abundant cover such as timber debris, rocks and undercut banks. Also occurs in slow-flowing lowland rivers, coastal and inland lakes.
Biological notes: Are secretive, benthic fish, which are not migratory and deposit eggs in hollow logs and rock cavities. Is predominately a carnivorous bottom feeder, particularly on insect larvae. Status is indeterminate and declining in its abundance and its range.



Southern Pigmy Perch *Nannoperca australis*



Features: Small (to 75mm), oblong, moderately compressed fish with large head; brownish-green body; darker dorsally; two horizontal bands of brown-black spots occur along the body.
Habitat: Prefers shady, weedy, slow-flowing or still waters, such as small creeks and backwaters of large rivers, as well as dams, lakes and billabongs. Prefers weedy aquatic vegetation.
Biological notes: Spawn in response to rising water temperatures from late winter to early spring.
Eggs are randomly scattered over the bottom, loosely adhering to rocks and vegetation. A carnivorous fish, feeding on a variety of invertebrates. Status is common/widespread.



How do I know if I have native fish on my property?

Besides angling, there are other less destructive methods to monitor fish on your property. If the water in your stream, river or wetland is clear, you might be lucky, if you sit quietly on the bank, to actually catch sight of native fish. They might be coaxed out by throwing breadcrumbs or worms into the water. This should only be done occasionally to observe the fish and not as a way of feeding the fish. At night, a spotlight can be used to catch sight of nocturnal species, such as eels and blackfish. However, these techniques make identification difficult. Dip netting using a hand net, may allow you to catch fish. If you wish to identify species, contact your local Wildlife Officer who may be able to suggest plans for a legal fish trap. Your area may have been surveyed already - ask for a fish list from the Atlas of Victorian Wildlife (CNR, Flora & Fauna Branch).

What type of habitat do native freshwater fish require?

Water quality

Clean water, containing no pollutants or high levels of sediment or nutrients, is vital for a healthy stream environment. Oxygen dissolved in the water is the 'air supply' for fish and is vital for fish to survive. Fish also require stable temperatures which influence physiological and behavioural responses, with each species having an optimal range. Salinity and pH (acidity) also have effects on fish populations.

Flow regime

Fish and other biota of Victoria's streams are adapted to natural flow regimes which are influenced by seasonal rainfall. Flooding can act as a trigger for some species to migrate and or spawn. Reduced flooding also reduces the chance to flush sediment and areas of poor water quality.

Nutrient sources

Fish are dependent on the flow of nutrients through the food chain. Organic material (leaves, branches, bark) from native riparian vegetation is very important at the beginning of the food chain, which in turn is processed by microbes in the water, then by various invertebrates, which then become food for fish.

Habitat structure

The number and diversity of fish is usually related to the quality of the habitat. Fish require habitats that may provide territories, nutrients, shade, and spawning sites, as well as shelter from fast flowing water, or predators and competitors. Instream objects such as logs, rocks, aquatic vegetation and leaf and twig litter are important in providing habitat. Native riparian (stream-side) vegetation is essential for a continuous supply of instream habitats and nutrients, for stabilising banks and acting as a filter of sediments and agricultural chemicals, fertilizers and waste.

What are the threats to native freshwater fish and what are the solutions?

Riparian (streamside) vegetation removal

Riparian vegetation is vital to the functioning of stream ecosystems. One of the main threats to streams is the removal of this native vegetation. Replacement with exotic species can also be detrimental to fish and other aquatic fauna. For example, deciduous trees, such as willows, alter the timing, quality and consistency of the nutrient supply. The leaves fall all at once, not continuously, as in Australian evergreens such as eucalypts. Willows can also impede flow by 'choking' small streams (see LFV News Vol 2 No.3).

Solution: Maintain and enhance streamside vegetation by fencing from stock and by weed control. Revegetate with indigenous natives including trees, shrubs and groundcovers.

Habitat removal

The removal of instream habitat by desnagging and general clearing has been widespread in Victoria and is detrimental to species such as Blackfish which is dependent on instream objects for habitat and spawning sites. Channelization removes all instream habitat for fish. Recent studies indicate that there is no scientific basis behind the removal of snags for the control of flooding.

Solution: Removal of instream habitats should be avoided. Trees and logs should be left as they are, and if missing from the stream, add some logs and branches. Avoid channelization.

Sedimentation

Sedimentation can occur from poor land management practices, such as extensive clearance of native vegetation or insufficient retention of pasture cover and overgrazing. It can also occur during dam and road construction, from unmade roads and cattle access points. The blanketing of substrate by sediment can lead to a decrease in usable habitat and unsuccessful attachment and smothering of fish eggs, while high levels of suspended solids in streams may be lethal to fish eggs, larvae and sometimes, even adults.

Solution: The broad strategy is to decrease erosion and prevent sediment reaching the stream by maintaining vegetation cover on all land, particularly along streambanks. Silt traps can be used during road construction and cattle access to streams should be restricted. Riparian vegetation can act as a filter zone.

Reduced water quality

Toxic spills, such as from farm chemicals, can create lethal situations while use of sprays in farm activities and effluent discharge can slowly decimate fish populations. Low level water releases from impoundments can reduce water temperatures dramatically, and decrease oxygen content.

Solution: Wise use and storage of farm chemicals. Riparian vegetation zones will help filter runoff from surrounding areas.

Barriers to fish passage

Fish passage problems are primarily a result of dams, weirs, drop structures, causeways and road crossings which physically block upstream movement.

Solution: Causeways and road crossings should be designed to avoid abrupt drops. Rocks and logs can be built up next to vertical drops to act as a 'fish ladder'.

Introduced species

There are thirteen species of introduced fish in Victoria. Many of these prey and compete with native fish. Species such as carp can also increase turbidity and destroy aquatic plant beds.

Solution: Avoid introducing non-native species to your dams, wetlands and streams. Provide hiding places for native fish.

References and further reading:

- Cadwallader, P.L. & Backhouse, G.N. (1983). *A guide to the Freshwater Fish of Victoria*. Victorian Government Printer.
- Koehn, J. (1992). Habitat requirements of the Murray Cod. *Land for Wildlife News*, Vol. 1 No. 5. Flora & Fauna Branch, CNR.
- Koehn, J.D., (1993). Fish need Trees. *Victorian Naturalist*, Vol. 110 (6).
- Koehn, J.D. & O'Connor, W. G., (1990). *Biological Information for Management of Native Freshwater Fish in Victoria*. Department of Cons. & Environment.
- Koehn, J.D. & O'Connor, W. G., (1990). Threats to Victorian Native Freshwater Fish. *Victorian Naturalist*, Vol. 107 (1)
- Land for Wildlife Note* No. 8, (1991). Principles of river and stream improvement for wildlife. Flora & Fauna Branch, CNR.
- Land for Wildlife Note* No. 28, (1994). Management of shallow freshwater wetlands for wildlife. Flora & Fauna Branch, CNR.
- McDowall, R.M., (1980). *Freshwater Fishes of south-eastern Australia*. Reed.
- O'Connor, W. G., (1994). Native fishes - the Broad-finned Galaxias and Spotted Galaxias. *Land for Wildlife News*, Vol. 2 No. 5. Flora & Fauna Branch, CNR.
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