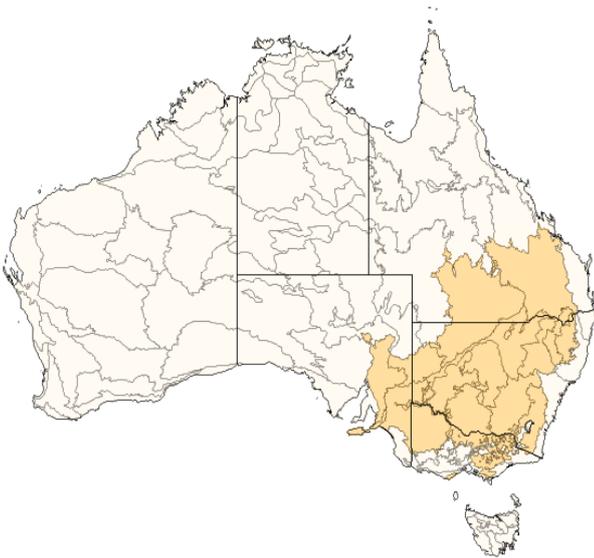


# Murray cod



Murray cod is one of the largest freshwater fish species, weighing up to 113kg and living nearly 50 years.<sup>1</sup> Unfortunately, the population of Murray cod is declining as a result of, among other things, regulated water flows, de-snagging and extensive clearing of riparian vegetation. Read on to find out how and why changes to habitat affect Murray cod ...

Murray cod (*Maccullochella peelii peelii*) are found in freshwater rivers and creeks in eastern South Australia and west of the Great Dividing Range in NSW, Victoria and southern Queensland.



**Figure 1:** Distribution of Murray cod ([www.environment.gov.au](http://www.environment.gov.au))<sup>1</sup>

## *Murray Cod Habitat Fact File*

Murray cod are found in freshwater habitats.

80% of Murray cod are found within 1 metre of a snag.

Snags provide a surface for eggs to be laid onto. They also provide a refuge from predators and fast flowing water.

Murray cod habitat has been extensively altered by human activities.

De-snagging rivers, artificial barriers such as weirs, introduced species and cold water pollution have all contributed to decline in the population of Murray cod.

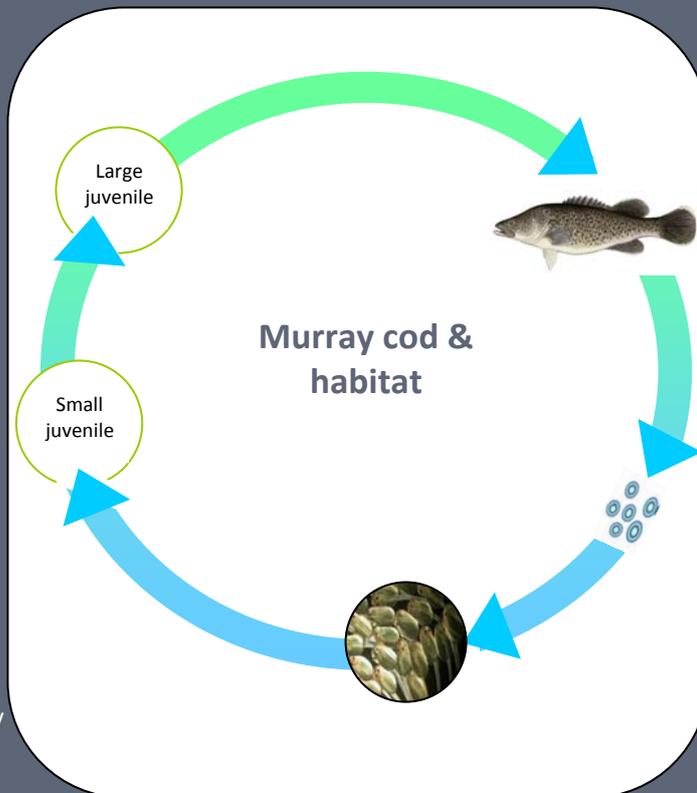
Resnagging, reinstating natural water flows and improving riparian vegetation will help Murray cod survive and thrive.

Adults prefer **slow flowing, turbid water** as well as **deeper water** around **boulders, undercut banks, overhanging vegetation and logs.**



Adults feed on fish, frogs, invertebrates and occasionally reptiles, birds and aquatic mammals.<sup>4</sup> This prey is found in and around **riparian and aquatic vegetation** in **freshwater creeks, streams and rivers.**

Juveniles and adults are found among **logs, sluggish water, deep holes, aquatic vegetation** and other cover. They rest in **hollows in rock or wood.**<sup>3,6</sup>



Spawning occur annually<sup>3</sup> from spring to summer<sup>4</sup> Eggs are deposited on **clay beds, rocks and logs** in **shallow and warm water.**<sup>3</sup> (see image below). Males guard the eggs.<sup>3</sup>

**High water levels** enhance the survival of eggs, larvae and juveniles by providing better **water quality** and more **food**<sup>3,6</sup>

Larvae feed on crustaceans, insects<sup>5</sup> and zooplankton<sup>4</sup> found in the **main channel** of a **river or stream**



Larvae hatch after 5-13 days and drift **downstream<sup>1</sup>** to find food and grow



## Threats to Murray cod habitat

Murray cod were once abundant throughout the Murray-Darling river system, but overfishing and changes to habitat have drastically reduced their numbers. The Murray cod is reliant on habitat features such as snags, holes, rocks and overhanging vegetation for food, shelter and to spawn.



Weirs (as pictured) in the Murray Darling Basin create a barrier for Murray cod reducing its access to habitat and food sources.

Changes such as river modification, clearing riparian vegetation, erosion, reduced river flows and de-snagging rivers have contributed to the decline of available habitat. Past land and stock management practices have also contributed because of the impact on water quality. Murray cod habitat continues to be threatened. The key threats to Murray cod habitat are summarised in the table below.

Threats to habitat	Impact on Murray cod
<p>De-snagging rivers</p> <ul style="list-style-type: none"> <li>- Increase level and speed of water flows</li> <li>- Creation of river channels</li> <li>- Increased bank erosion</li> </ul>	<ul style="list-style-type: none"> <li>✗ The removal of structure reduces the surfaces available for depositing eggs</li> <li>✗ Without snags young Murray cod are more vulnerable to predation</li> <li>✗ Deep water holes may fill with sediment from bank erosion</li> <li>✗ High water flow creates less desirable habitat as both juveniles and adults prefer slow flowing water</li> <li>✗ Snags can also be habitat for the animals Murray cod prey upon</li> </ul>
<p>Barriers such as weirs, causeways, floodgates</p> <ul style="list-style-type: none"> <li>- Altered water flows</li> <li>- Reduced frequency, magnitude and duration of floods</li> </ul>	<ul style="list-style-type: none"> <li>✗ Barriers prevent larvae from drifting downstream to find food and grow</li> <li>✗ Barriers prevent juveniles and adults from accessing habitats, reducing potential shelter, food sources and spawning sites</li> <li>✗ Larval and juvenile mortality is higher if they travel past weirs (especially through undershot weirs)</li> </ul>
<p>Cold water pollution</p>	<ul style="list-style-type: none"> <li>✗ Spawning occurs in water temperatures of approximately 20°C</li> <li>✗ Larvae hatching is dependent upon water temperature</li> <li>✗ Food availability is affected by water temperature</li> </ul>
<p>Introduced species</p> <ul style="list-style-type: none"> <li>- Fish e.g. Redfin perch, Carp</li> </ul>	<ul style="list-style-type: none"> <li>✗ The feeding behaviour of carp creates more turbid water as these fish suck detritus and soft plant matter from bottom sediment. Large numbers of carp and high turbidity damage aquatic vegetation, affecting Murray cod and its prey</li> <li>✗ Introduced species, such as redfin perch, prey on Murray cod larvae</li> </ul>

## What you can do

- ✓ Get your hands dirty controlling weeds such as willow
- ✓ Lend a hand replanting native vegetation bordering creeks, rivers and streams
- ✓ Help a farmer fence off a creek to prevent bank erosion caused by stock
- ✓ Join a 'carp muster' day
- ✓ Don't release redfin back into the waterway
- ✓ Visit [www.fishhabitatnetwork.com.au](http://www.fishhabitatnetwork.com.au) and find out what other fishers are doing to improve their local fish habitats
- ✓ Join the Fish Habitat Network ([fish.habitat@industry.nsw.gov.au](mailto:fish.habitat@industry.nsw.gov.au))



### References

- 1 Koehn, J. D., McKenzie, J.A., O'Mahony, D.J., Nicol, S.J., O'Connor, J.P. and O'Connor, W.G. 2009. Movements of Murray cod (*Maccullochella peelii peelii*) in a large Australian lowland river. *Ecology of Freshwater Fish*. Vol. 18. pp- 594-602.
- 2 Department of the Environment, Water, Heritage and the Arts. Australian Biological Resources Study, Australian Faunal Directory. [www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/taxa/Acanthopagrus\\_australis](http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/taxa/Acanthopagrus_australis). Accessed on 29/07/10.
- 3 Koehn, J.D. and O'Connor, W.G. 1990. *Biological information for management of native freshwater fish in Victoria*. Department of Conservation and Environment. Freshwater Fish Management Branch. Arthur Rylah Institute for Environmental Research.
- 4 Froese, R. and Pauly, D. Editors. 2010. Fishbase. World Wide Web electronic publication. [www.fishbase.org](http://www.fishbase.org), version (05/2010)
- 5 Kaminskis, S. and Humphries, P. 2009. Diet of Murray cod (*Maccullochella peelii peelii*) (Mitchell) larvae in an Australian lowland river in low flow and high flow years. *Hydrobiologia*. Vol. 636. pp- 449-461.
- 6 Rowland, S.J. 2004. Overview of the history, fishery, biology and aquaculture of Murray cod (*Maccullochella peelii peelii*), in *Management of Murray Cod in the MDB: statements, recommendations and supporting papers*, Workshop, Canberra June2004, Murray Darling Basin Commission.

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