



Above
Murray Cod - *Maccullochella peelii peelii*
in the Gwydir River. Photo - NSW DPI-Fisheries

Murray cod: an Icon of the Murray-Darling Basin

What is the first fish species that pops into your head when you think of the Murray-Darling Basin?

I bet it's the Murray cod (pictured above). You might remember a family fishing trip and cod on the BBQ. Or maybe you have just seen pictures or film of Australia's largest freshwater fish.

Aboriginal dreaming stories link the Murray cod to the formation of the Murray River and other native fish. Known as Guduu in Traditional Gamilaraay language, the Murray cod was, and still is, a major food source and cultural icon for the nations in the Murray-Darling Basin. It is literally good for the body and soul.

Murray cod is now considered a Vulnerable species under the Federal EPBC Act 1999. Overfishing, land use change leading to poor water quality, capture of water in large dams for irrigation and other use, blocking fish passage via weirs, dams and other structures, competition from invasive species such as carp, and harsh droughts exacerbated by global warming have all led to alarming declines in the populations of this once abundant fish.



Figure 1: Juvenile Murray cod (length: 105 mm) collected in June 2020 as part of the MER project.
Photo - John St. Vincent Welch (NSW DPI-Fisheries)



Figure 2. River red gums on the banks of the Gwydir Wetlands (within the Northern reaches of the Murray Darling Basin). Photo - Annette Debbe

Cod and Flow

We know that Murray cod respond to increased flows and often swim 10s or even 100s of kilometres looking for food, habitat and breeding partners during these events. They also require flowing, good quality water over 18 °C from September to December to breed successfully. Headwater dams have reduced natural flows during the key breeding season and water released from dams is often well below 18 °C. These factors have combined to reduce cod breeding opportunities and success rates.

The role of environmental water

Supporting the breeding season

This year, the Commonwealth Environmental Water Office (CEWO) managed an environmental flow release of 107 gigalitres (GL) into the Macquarie River over the course of the Murray cod breeding season. This release was timed to enhance cod breeding opportunities by ensuring flowing water of good quality to support and protect the cod eggs, larvae and juveniles (Figure 1).

In addition, the environmental water increased in-stream connectivity (longitudinal connectivity) and linked the river to local wetlands (lateral connectivity) and their abundant resources. Adequate flows ensure that nests are not exposed to air or threatened by poor water quality, increasing the likelihood of larvae reaching adulthood. Once hatched, larvae use the flows to drift downstream and find food sources to support their growth.

Maintaining habitat and a healthy food web

Murray cod rely on large woody snags for habitat, turning fallen tree trunks and branches of riparian trees such as River red gum (Figure 2) into nests and shelters. The flows give the trees a drink and flush organic matter from the floodplains, starting processes that create the cod's food sources.

Not only the cod benefit, but so do other aquatic species, fuelling the food web in the river. Vegetation and species such as other fish, frogs, crustaceans, zooplankton and insects all benefit from healthy flow regimes.

Fish love water

Without water, you guessed it... no Murray cod. Water for the environment aims to safeguard the ecosystems that the Murray Cod depend on, giving this Vulnerable species a better chance to rebuild their population.

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Commonwealth Environmental Water Office