



HUGHES CREEK PROJECT FACT SHEET

Work is being undertaken to improve stream health and fish habitat for the nationally endangered Macquarie perch.

Macquarie perch (*Macquaria australasica*) reside in deep pools and spawn in fast, shallow waters passing over gravels and larger rocks, known as riffles. Generally less than 1kg in weight and less than 350mm in length, they have been recorded up to 3.5kg and 465mm.

The fish is bluish-grey or black-grey in colour, with large white eyes, rounded tail and prominent pores on the snout and around the eyes. Adults have a prominent lateral line down the side of their body.

Once widespread, this species has declined dramatically since the 1920's, with remaining populations relatively small and isolated. There are 11 known populations remaining in Victoria, including one small population here in the Hughes Creek.



Figure 1: Map of Hughes Creek River Reaches - defined stretches of stream with similar characteristics.

Hughes Creek commences in the Black Range and flows across the Ruffy Tablelands as swamps and chains of ponds, before descending into the Hughes Creek Valley via two granite gorges within Reaches 3 to 5. Emerging onto the Riverine Plain above Avenel, the remaining 23km to the confluence with the Goulburn River is slowly recovering from a build-up of sand, causing the channel to be uniformly shallow.

Macquarie perch are present in Reaches 3, 4 and 5, with their stronghold within the best habitat of Reach 4. To protect and increase the population of Macquarie perch, the Goulburn Broken Catchment Management Authority (GB CMA) is working to improve the length, number and condition of the riffles and pools within the Hughes Creek. A long-term aim is to reconnect this population to the Goulburn River and other isolated populations in King Parrot Creek and Yea River.

THREATS

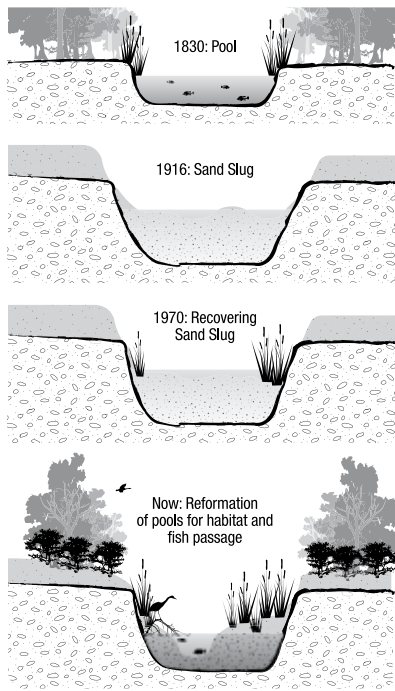


Figure 2: Depiction of the evolution of Hughes Creek since European settlement.

Large Volumes of Sand

Sand within the Hughes Creek is the primary threat to this population. A large flood in 1916, combined with a number of activities associated with European settlement, led to gullyng that generated large volumes of sand. The tributaries eroded at different times, but most had gullied by the 1970s, contributing further sediment to the sand slug that formed. With improved farm management, the catchment is no longer a source of sand, however high flow events continue to rework the sand within the channel as it progresses downstream, infilling deep holes and smothering gravel riffles which are important habitats for Macquarie perch.

Degraded Riparian Vegetation

Without good riparian vegetation, stream banks are more prone to erosion. In addition to stabilising banks, vegetation cover captures sediment, effectively improving water quality. Aquatic and many terrestrial species, rely on riparian vegetation for the shade, shelter and food it provides. Fragmented vegetation lacking in structure and diversity cannot perform these important functions.

Introduced (non-native) Fish

Redfin (*Perca fluviatilis*), Trout (*Salmonides*) and Carp (*Cyprinus carpio*) are introduced fish species which are found in Hughes Creek. All three species compete with Macquarie perch for food and habitat. Redfin and Trout are also known to directly predate on Macquarie perch eggs and juveniles, while Carp can reduce water quality and disturb aquatic vegetation as they forage for food. In recent years, Carp in particular have been reported in high numbers.

ACTIONS

1. The highest priority is to reduce reworking of sand within the channel by improving riparian vegetation, particularly above the remnant population of Macquarie perch.
2. Encouraging colonisation of macrophytes (reeds and rushes) to stabilise the in-channel sand is best achieved through revegetation and stock control.
3. Complemented with habitat improvement works, like re-snagging, the number, length and quality of both pools and gravel riffles can be increased to expand the population and range of this threatened species.
4. Actively encouraging anglers to fish for feral fish can also benefit Macquarie perch by reducing predation and competition.



Figure 3: Macquarie perch (Jarod Lyon).

Stopping Shifting Sand

High flows transport and relocate sand within the channel. Fast growing reeds and rushes (*emergent macrophytes*) slow the water as it passes through the stems, encouraging the sand to settle out and collect in deposits. As the sand deposits grow, so does the cover of macrophytes, holding the sand in place with their deep roots. In high flow events, the bending reeds and rushes offer further protection by lying flat over the sand, shielding it from further transport. Macrophytes have no impact on the capacity of channels to convey high flows, so do not contribute to flooding.



Figure 4: Macrophytes stabilising sand along the bank. As they bend in high flows they do not contribute to flooding.

Pools For Perch

Stabilising the sand not only helps protect existing pools, which are Macquarie perch refuges, but also helps create more pools. As the sand and emergent macrophytes reduce the channel's width, they also encourage streambed deepening within the constricted flow. This means as the channel narrows, it creates deeper waters. Instream large wood and rock can also create habitat by causing some local scour and providing shelter. Large wood and rock will be reintroduced to improve pool habitat for Macquarie perch to extend their current range both upstream and downstream.



Figure 5: Instream habitat works – large wood and boulders placed to encourage depth in channel and sand deposition along bank.

Fishing for Introduced Fish

Catching introduced (non-native) fish can be rewarding, for both the angler and the native fishery. There is growing evidence that carp in particular, due to their schooling behaviour, can be effectively fished out from a site through successive angling effort.

As native fish favour live bait, Carp can be targeted by use of non-live bait like corn. When visible instream, casting lures to desired fish is another method for targeting introduced fish species.

Carp when caught, cannot be returned to the stream, while Macquarie perch are protected and must be returned as swiftly and sensitively as possible.

RESEARCH AND MONITORING



Figure 6: Backpack electrofishing (Joanne Kearns). Figure 7: One year old Macquarie perch (Renae Ayres)

Fish surveys are undertaken to improve our understanding of the Macquarie Perch population health and distribution. This information guides where and what management actions will best improve resilience of the population.

Habitat rehabilitation work sites are similarly monitored to evaluate how Macquarie perch respond to changes and guide future habitat restoration efforts.

Further information on the Hughes Creek Project can be viewed at our website www.gbcma.vic.gov.au/projects/hughes_creek or contact Christine Glassford at the Yea Office on (03) 5797 4400.

The Hughes Creek Project is run as part of the Goulburn Broken CMA's On-ground Works Program with funding from the Victorian Government.

Fish surveys undertaken in March 2015 produced encouraging results for Macquarie perch. Using fyke netting and backpack electrofishing techniques, 16 sites were surveyed. A total of 1125 fish were captured, comprising of seven native and five introduced species.

The abundance of Macquarie perch and River blackfish (*Gadopsis marmoratus*) was found to have considerably increased since fish surveys were last conducted in autumn 2013 and are the highest since surveys commenced in 2003.

Macquarie perch were located at eight of the survey sites, of which over 51% collected were one year of age (110-160mm in length) and young of year accounted for 16%. The considerable increase in both these native species is largely driven by the successful recruitment of both species during the past two years.

Carp remained the most dominant exotic species captured and were collected from 12 of the 16 sites surveyed, having also considerably increased in abundance since 2013.

HOW YOU CAN HELP

Revegetation protection and enhancement – manage stock access to the stream with fencing to protect the riparian vegetation from uncontrolled grazing. Encourage natural regeneration and undertake revegetation works where appropriate. GB CMA offers funding support for fencing and off stream water and coordinates revegetation works.

Habitat improvement – Do not remove fallen timber from the channel and maintain vegetation along stream banks as the source for more. GB CMA aims to work with adjoining landholders to progressively improve instream habitat throughout sections of stream.

Focused fishing effort – Apply Carp targeted fishing techniques to reduce or remove Carp from a favoured fishing spot. This will benefit native fish and your opportunity to catch something other than Carp. Should Macquarie perch be caught, please handle with care and return to stream as soon as able.

Increase awareness – Share your knowledge and experience with the GB CMA and others. The more people know, the more we are able to learn and make a collective difference.