

Australian Grayling - *Prototroctes maraena*

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Figure 1: An Australian Grayling (Image: Pat Tully)

Introduction

Australian Grayling, also sometimes called the Cucumber Mullet or Cucumber Herring, is a small to medium-sized slender fish endemic to south-eastern Australia, including Victoria, Tasmania and New South Wales. The association with cucumbers is due to its distinctive cucumber odour when freshly caught.

Australian Grayling is a migratory species. It spawns in the lower freshwaters of coastal rivers and spends approximately 6 months in coastal seas as larvae/juveniles before migrating back into freshwater rivers and streams where they remain for the rest of their lives.

While there are no reliable population estimates, current reports of the species indicate that it is relatively uncommon and is often only caught in small numbers.

The Australian Grayling is fully protected in Australia under Commonwealth and state legislation (NSW, Victoria, South Australia and Tasmania). It is also listed on the IUCN Red List of threatened species and is considered vulnerable by the Australian Society for Fish Biology.

In NSW, the Australian Grayling is listed as an **endangered species**. There are heavy penalties for harming, possessing, buying or selling them, or for harming their habitat (see 'Legal Implications').

Description

The Australian Grayling is a slender fish with a small head and rounded snout. The colour varies from silvery with an olive-grey back and whitish belly to olive-green or brownish on the back, with clear to greyish fins. Australian Grayling can grow to 300 mm in length, but are more commonly around 170-180 mm long.

The species can be confused with various species of mullet which occur in freshwater, but the Australian Grayling has a distinctive small, fleshy fin between the dorsal fin and tail, and the pectoral fin sits below rather than at the upper edge of the gill cover. Small Australian grayling can be easily confused with the related and very common Australian Smelt. Grayling and smelt can be distinguished by the position of the dorsal fin, which is forward of the anal fin in grayling, but aligned with the anal fin in smelt.

Habitat and Ecology

- Australian Grayling are a relatively short-lived species, with a maximum known age of 5 years, but with very few surviving to more than 3 years. Males reach sexual maturity around 1 year of age and 15 cm in length, and females at 2 years.
- Spawning occurs between late summer and winter in the lower freshwater reaches of rivers, with exact timing dependent on location and annual conditions. Spawning is thought to be initiated by an increase in river flow from seasonal rains. Temperature and lunar phase may also be influential.
- Females can lay up to 47,000 small (approx. 0.9 mm diameter) eggs, probably within the tidal freshwater reaches of rivers, where they presumably settle among the gravel of the streambed.
- Larvae hatch after 10-20 days and are approx. 6.5 mm long. They drift downstream and out to sea before migrating back into freshwaters in spring, when they are ~45-55 mm long and ~4-6 months of age. Individuals then remain within freshwater habitats for the remainder of their lives.
- During the freshwater phase of the life cycle, Australian Grayling inhabit lower altitude reaches of both large rivers and smaller streams.
- Very little is known about the specific environmental requirements or habitats occupied during the estuarine or marine phase of the life-cycle as very few specimens have been collected.
- Australian Grayling are omnivorous, feeding on a variety of small aquatic organisms, including crustaceans, insects and their larvae, zooplankton and algae.

Why is the Australian Grayling threatened?

- Fish passage barriers restrict access to otherwise suitable habitat.
- River regulation threatens populations by eliminating or suppressing migration and spawning cues. High flows in late Autumn and early winter are thought to be particularly important.
- Loss of riparian vegetation, sedimentation and sand and gravel extraction lead to general declines in aquatic ecosystem health.

- Broader processes and factors affecting populations at a larger scale may include: disease epidemics, increased temperatures and reduced stream discharge resulting from climate change, or oceanographic processes and fishing industries affecting the marine phase of the life cycle.

Conservation and recovery actions

- Ensure Australian Grayling conservation requirements are included in fishway programs.
- Protect and restore riparian habitat in catchments supporting Australian Grayling populations, with priority to those catchments supporting important habitat/populations.
- Ensure important populations and locations are protected from stocking of trout.
- Investigate larval and juvenile distribution, habitat and movements.
- Determine gaps in distribution data and undertake surveys to determine presence and significance of grayling populations in areas poorly surveyed.
- Report any sightings of the species via the NSW DPI online form: www.dpi.nsw.gov.au/fisheries/species-protection/report-it
- A full list of strategies to be adopted for promoting the recovery of the Australian Grayling is set out in the NSW DPI Priorities Action Statement: <http://www.dpi.nsw.gov.au/fisheries/species-protection/priorities-action-statement2>



Figure 2: An Australian Grayling (Image: Gunther Schmida)

Legal implications

It is illegal to catch and keep, buy, sell, possess or harm Australian Grayling (or any other threatened species in NSW) without a specific permit, licence or other appropriate approval, and significant penalties apply. For endangered species, these penalties can include fines of up to \$220,000 and up to 2 year in prison.

There can also be significant penalties for causing damage to the habitat of a threatened species without approval, through actions such as dredging river beds, removing large woody debris and constructing barriers that block the free passage of fish.

Clearing that constitutes a routine agricultural management activity, and certain routine farming practice activities (other than clearing) are permitted, provided the activities are to the minimum extent reasonably necessary and all other relevant statutory approvals or authorities have been obtained.

The impacts of developments or activities that require consent or approval in accordance with the *Environmental Planning and Assessment Act 1979* must be assessed and considered by consent or determining authorities. Where such actions are likely to result in significant impact on a threatened species or its habitat, a detailed species impact statement must be prepared.

Strategies to be adopted for promoting the recovery of the Australian Grayling must be set out in the NSW DPI Priorities Action Statement.

A recovery plan may be prepared in accordance with the provisions of the *Fisheries Management Act 1994* to promote the recovery of the species to a position of viability in nature.

Bibliography and further reading

Backhouse, G., Jackson, J. and O'Connor, J. (2008a) National Recovery Plan for the Australian Grayling *Prototroctes maraena*. Department of Sustainability and Environment, Melbourne.

Backhouse, G., Jackson, J. and O'Connor, J. (2008b) Background and Implementation Information for the Australian Grayling *Prototroctes maraena* National Recovery Plan. Department of Sustainability and Environment, Melbourne.

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Koster, W. M., Dawson, D. R., and Crook, D.A. (2013). Downstream spawning migration by the amphidromous Australian grayling (*Prototroctes maraena*) in a coastal river in south-eastern Australia. *Marine and Freshwater Research* **64**: 31-41.

For further information

See the NSW DPI website: www.dpi.nsw.gov.au

Contact the NSW DPI Threatened Species Unit:
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