

Southern Purple Spotted Gudgeon – *Mogurnda adspersa*

July 2017, Primefact 1275, Second Edition
Threatened Species Unit



Figure 1: A Southern Purple Spotted Gudgeon from the Murray-Darling Basin (Photo: G. Schmida)

Introduction

Southern Purple Spotted Gudgeon is a small freshwater fish native to Australia. Two populations of Southern Purple Spotted Gudgeon occur in NSW; an eastern population found in coastal catchments north of the Clarence River, and a western population found throughout Murray-Darling Basin. During the early 1980s, the Murray-Darling Basin population experienced rapid and dramatic reductions in distribution and abundance. The population is now confined to small remnant populations in the Macquarie, Gwydir and Border Rivers catchments and a self-sustaining population created from captive-bred fish in the Castlereagh Catchment. Since all remaining populations in the western region are small, isolated and disconnected from each other, there is limited gene flow between populations.

There have been few recent records of the eastern population despite targeted sampling at those locations where the species has previously been found. Only two extant populations are known, one in the Richmond catchment and the other in the Hunter Valley. However, the population in Goorangoola Creek (Hunter River catchment) is outside what was previously

considered the natural range of the species and it remains unknown whether the population is endemic or recently introduced.

Southern Purple Spotted Gudgeon is listed as an **endangered species** in NSW. There are heavy penalties for harming, possessing (wild caught), buying or selling them, or for harming their habitat (see 'Legal implications').

Description

Southern Purple Spotted Gudgeon have a rounded head with a small mouth and a rounded tail. They have two dorsal fins; the first being shorter and lower than the second. They are generally dark brown in colour along the back, fading to pale brown or cream on the belly. A number of distinguishing markings occur along the body, such as white and red spots and a blue wash along the flanks, all of which brighten during breeding, and yellow bars on the margins of the dorsal and anal fins. The three red-maroon bars on the cheek differentiate the species from other similarly shaped freshwater gudgeon species within NSW even at very small sizes (such as Coxs, Striped and Flathead Gudgeons). Southern Purple Spotted Gudgeon grow to around 15 cm in length.

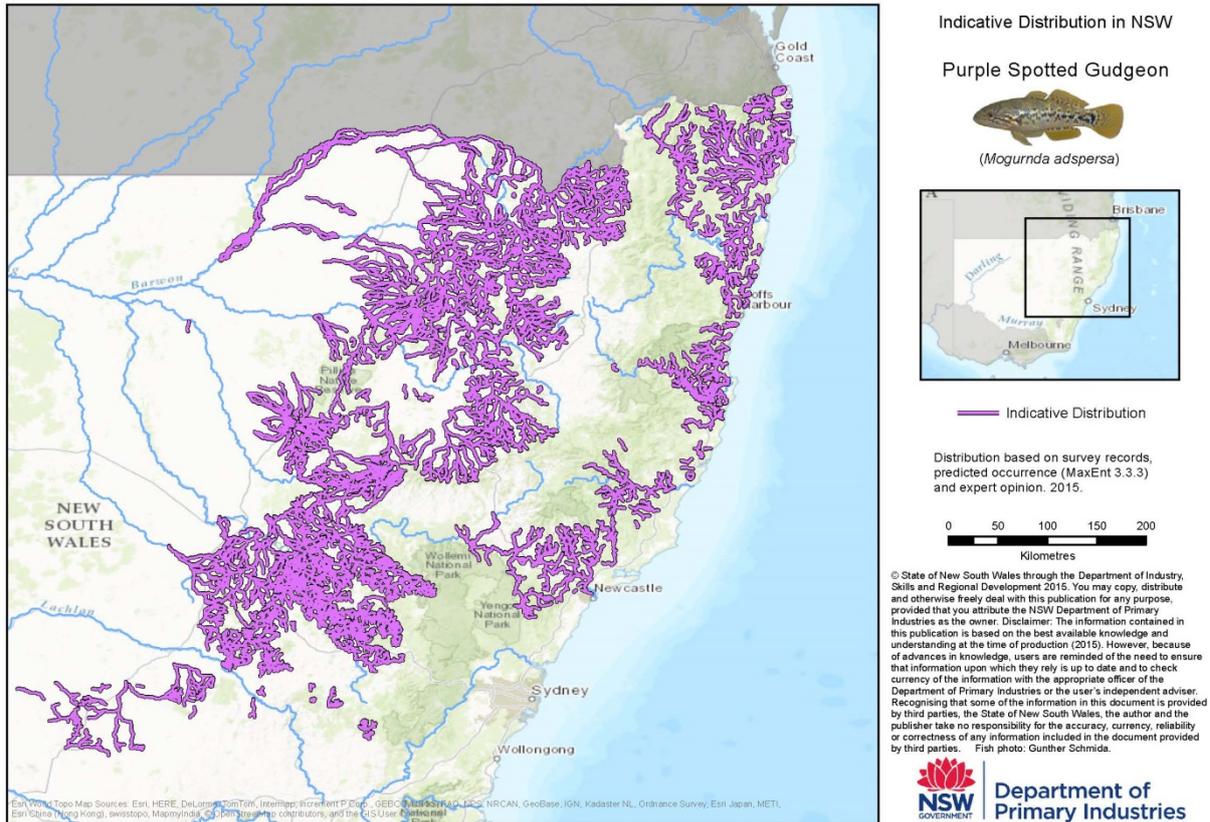


Figure 2: Current indicative distribution of Southern Purple Spotted Gudgeon in NSW, modelled from past catch data and environmental conditions.

Habitat and ecology

- Southern Purple Spotted Gudgeon are a benthic species that can be found in a variety of habitat types such as rivers, creeks and billabongs with slow-moving or still waters or in streams with low turbidity. Cover in the form of aquatic vegetation, overhanging vegetation from river banks, leaf litter, rocks or snags are important for the species.
- Most remnant populations in NSW occur in small to medium sized streams.
- They feed mainly on terrestrial insects and their larvae, worms, small fish, tadpoles, and some plant matter.
- Males reach maturity at about 4.5 cm and females at about 5 cm in length.
- Males have an elaborate courtship display and spawning occurs over summer when water temperatures are warmer.
- Females may lay several batches of eggs per season (30 - 1,300 per batch). The eggs are small (2 - 4mm long), elongated, sticky and transparent. They are deposited in clusters on solid objects such as rocks, wood or broad-leaved plants. The male guards and fans the eggs until they hatch (3 - 8 days).

- Newly hatched larvae are approximately 4mm long.

Why are Southern Purple Spotted Gudgeon threatened?

- Predation by introduced fish such as Eastern Gambusia (*Gambusia holbrooki*) and Redfin Perch (*Perca fluviatilis*).
- Habitat disturbance by common carp (*Cyprinus carpio*).
- Loss of favourable habitat, particularly aquatic plants.
- Fluctuations in water levels and flow as a result of river regulation have a significant impact on the inundation frequency for wetland habitats including habitats important for Southern Purple Spotted Gudgeon reproduction and recruitment.
- Thermal pollution.
- Increased turbidity and damage of stream banks by livestock access.
- Decreased water quality due to agricultural runoff and siltation.
- Local extinctions may not be naturally recolonised because of the species' inability to disperse the long distances required.

- Populations are generally small and isolated from each other, and therefore vulnerable to localised extinctions from severe events.

Conservation and recovery actions

- Develop and implement control programs for introduced pest species.
- Promote appropriate land management practices to improve water quality and river health.
- Allocate environmental water flows in regulated rivers to restore natural seasonal flow patterns and maintain connectivity and inundation of key habitat such as wetlands.
- Maintain bans on the taking of Southern Purple Spotted Gudgeon from the wild and enforce compliance with fishing regulations.
- Educate the community about the protected status of Southern Purple Spotted Gudgeon and how they can assist with the recovery of this species.
- Conduct further research investigating reasons for their decline and assess distribution.
- Prevent sedimentation and poor water quality by improving land management practices, conserving and restoring riparian vegetation and using effective erosion and sediment control measures.
- Report any sightings of the species via the NSW DPI online form: www.dpi.nsw.gov.au/fishing/species-protection/report-it
- A full list of strategies that have been adopted for promoting the recovery of Southern Purple Spotted Gudgeon is set out in the [NSW DPI Priorities Action Statement](#).

Legal implications

It is illegal to catch and keep, buy, sell, possess or harm Southern Purple Spotted Gudgeon (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 two years 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 Southern Purple Spotted Gudgeon are set out in the NSW DPI Priorities Action Statement.

Bibliography and further reading

Faulks, L.K., Gilligan, D.M. and Beheregaray, L.B. (2008) Phylogeography of a threatened freshwater fish (*Mogurnda adspersa*) in eastern Australia: conservation implications. *Marine and Freshwater Research*, **59**(1): 89-96.

Fisheries Scientific Committee 2008. Final determination: *Mogurnda adspersa* – Purple spotted gudgeon

Lintermans, M. 2009. Fishes of the Murray-Darling Basin: An introductory guide. Murray Darling Basin Authority, Canberra, 157 pp.

Sasaki, M., Hammer, M.P., Unmack, P.J., Adams, M. and Beheregaray, L.B. (2016) Population genetics of a widely distributed small freshwater fish with varying conservation concerns: the southern purple spotted gudgeon, *Mogurnda adspersa*. *Conservation Genetics*, **17**(4): 875-889.

For further information

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

Contact the NSW DPI Threatened Species Unit:
PO Box 1305
Crows Nest NSW 1585

Email: fisheries.threatenedspecies@dpi.nsw.gov.au

© State of New South Wales through the Department of Industry, Skills and Regional Development, 2017. You may copy, distribute and otherwise freely deal with this publication for any purpose, provided that you attribute the NSW Department of Primary Industries as the owner.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (July 2017). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the user's independent advisor.

ISSN 1832 6668

PUB12/153

Figure 3-6: Examples of Southern Purple Spotted Gudgeon habitat (Photos: D. Gilligan)



Figure 7 and 8: A Southern Purple Spotted Gudgeon (Photo: G. Schmida) (left) and a Southern Purple Spotted Gudgeon guarding larvae in captivity (Photo: M. Hammer) (right)

