

# Threatened Species of the Northern Territory

## Finke Goby

### *Chlamydogobius japalpa*

#### Conservation status

##### Australia: Not listed

*Environment Protection and Biodiversity Conservation Act 1999*

##### Northern Territory: Vulnerable

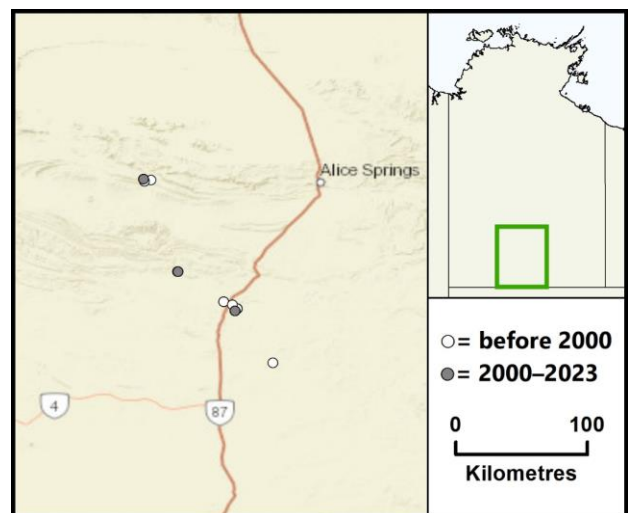
*Territory Parks and Wildlife Conservation Act 1976*

#### Description

The Finke Goby is a small fish that grows to a maximum length of around 5.5 cm (more commonly 2-3 cm). The body is usually pale yellowish-brown to grey-brown. Darker markings above give an appearance of fine vermiculations and indistinct saddles or blotches. The first dorsal fin is small and has a blue median band and paler yellowish submarginal band. Breeding males display more vivid blue/white fin colouration. The caudal and pelvic fins are large and rounded. Study of the species' taxonomy is ongoing<sup>1, 2, 3</sup>.

#### Distribution

The Finke Goby is a narrow-range endemic that is restricted to the upper and mid Finke River. It occurs patchily from the Finke River headwaters to approximately 300 km downstream<sup>4</sup>. Historically, the species also occurred in a major tributary of the Finke River – that of the Palmer River sub-catchment; however, it is now likely extirpated from there, despite the presence of suitable habitat. Within the Finke River, the species is restricted to isolated permanent and near-permanent waterholes, except after heavy rainfall when the river may flow and temporary waterholes are filled. Springs may play an important role as refuge sites and source



Known localities of the Finke Goby in the NT ([nrmmaps.nt.gov.au](http://nrmmaps.nt.gov.au))

populations for the recolonisation of ephemeral sites after rain<sup>2</sup>.

NT conservation reserves where reported: Finke Gorge National Park, Tjoritja/West MacDonnell Ranges National Park.

#### Ecology and life-history

The ecology of the Finke Goby has been poorly studied; however, it is likely similar to the more common and closely related Desert Goby (*Chlamydogobius eremius*), which has been extensively studied. Both species are tolerant of a wide range of environmental conditions. The

water temperature, salinity and pH of pools occupied by the Finke Goby can vary substantially<sup>5</sup>. The species can survive low oxygen levels in part by gulping atmospheric air for short periods<sup>6</sup>. Shallow, highly saline pools may be important for breeding events, despite not being permanent (albeit some are long-term or long-lasting between flows). Such pools are often numerous in the mid-Finke River system and the water in them is too saline for horses and cattle to drink, which may have contributed to the persistence of the Finke Goby in a system in which there are impacts from large introduced herbivores.

The Finke Goby is a bottom-dweller and uses its pelvic and caudal fins to propel itself off the river bottom for short distances. During flow events, it shelters between rocks and uses its pelvic fins to anchor in place. It is commonly found amongst detritus and vegetation on hard-bottomed substrates. Like other species of *Chlamydogobius*, the Finke Goby is an omnivore, feeding on small crustaceans, insect larvae, filamentous algae and detritus<sup>7</sup>.

Spawning occurs in the summer months, especially after rain. A female lays adhesive eggs in rock cavities or caves. The male then guards the eggs, fanning them almost constantly until they hatch<sup>7</sup>. Gobies mature rapidly and rarely live beyond three years<sup>8</sup>.

## Threatening processes

A significant threat to the Finke Goby is the degradation of permanent and near-permanent waterholes by livestock, feral horses *Equus caballus* and feral camels *Camelus dromedarius*. Trampling of river and creek banks by these animals leads to soil erosion and the infilling of waterholes and shallow pools. This can also compromise water quality (e.g. low dissolved oxygen, algae blooms).

The Finke River is ephemeral and permanent or near-permanent spring-fed waterholes serve as refugia, as well as source populations for recolonisation after flooding. Such sites also provide the appropriate substrates (gravels and cobbles) for the Finke Goby to reproduce. The

loss of such waterholes in the upper Finke River increases the threat to the species<sup>9</sup>.

The introduction and spread of invasive fish species, such as the Eastern Gambusia *Gambusia holbrooki*, is potentially a significant threat to the Finke Goby. Although Gambusia species are currently not found in the Finke River system, the Eastern Gambusia is spreading rapidly in artificial and natural water bodies through central Australia<sup>10</sup>. Competition from the Eastern Gambusia species has been implicated in the decline of two other goby species in central Australia, and therefore may similarly threaten the Finke Goby.

Impacts from invasive grasses and the effects of climate change on the availability and condition of desert pools are also of growing concern.

## Conservation objectives and management

Management priorities include: (i) proactive education and assessment programs to prevent the introduction, or manage the spread of, potentially destructive introduced fishes in central Australia; (ii) measures such as stock exclusion and environmental water planning to protect the core refuges of the Finke Goby; (iii) further survey and research to better understand habitat use, geographic extent and population size; and (iii) general stream-side (riparian) restoration and protection works.

Ongoing monitoring is required to determine if there are declines in the population of the Finke Goby across the Finke River system, as well as to potentially allow early detection and control of introduced fish species.

## References

<sup>1</sup> Larson, H.K. 1995. A review of the Australian endemic gobiid fish genus *Chlamydogobius*, with descriptions of five new species. The Beagle: Records of the Museum and Art Gallery of the Northern Territory 12:19-51.

<sup>2</sup> Mossop, K.D., Adams, M., Unmack, P.J., Smith Date, K.L., Wong, B., Chapple, D.G. 2015. Dispersal in the desert: ephemeral water drives connectivity and phylogeography of an arid-adapted fish. Journal of Biogeography 42: 2374-2388.

- <sup>3</sup> Mossop, K.D., Lemmon, A.R., Lemmon, E.M., Eytan, R., Adams, M., Unmack, P.J., Smith Date, K., Morales, H.E., Hammer, Wong, B.B.M., Chapple, D.G. 2023. Phylogenomics and biogeography of arid-adapted *Chlamydogobius* goby fishes. *Molecular Phylogenetics and Evolution* 182:107757.
- <sup>4</sup> Hammer, M. 2019. *Chlamydogobius japalpa*. The IUCN Red List of Threatened Species 2019: e.T122914080-A123382416.
- <sup>5</sup> Glover, C. 1982. Adaptations of fishes in arid Australia, in: Barker, W., Greensland, P. (Eds.), *Evolution of the Flora and Fauna of Arid Australia*, Peacock Publications, Adelaide.
- <sup>6</sup> Thompson, G.G, Withers, P.C. 2002. Aerial and aquatic respiration of the Australian desert goby, *Chlamydogobius eremius*. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology*. 2002:131:871-879.
- <sup>7</sup> Bray, D.J. 2023. *Chlamydogobius japalpa*. In: *Fishes of Australia*, accessed 22 Jan 2024, <https://fishesofaustralia.net.au/home/species/1325>.
- <sup>8</sup> Thompson, G. 1983. The desert goby *Chlamydogobius eremius*. *Fishes of Sahul* 1:17-20.
- <sup>9</sup> Johnston, C.E. 1999. The relationship of spawning mode to conservation of North American minnows (Cyprinidae). *Environmental Biology of Fishes* 55:21-30.
- <sup>10</sup> Wager, R., Unmack, P.J. 2002. *Fishes of the Lake Eyre catchment of central Australia*. Department of Primary Industries and Queensland Fisheries Service, Brisbane.