

# *Galaxias pedderensis*

Pedder galaxias

TASMANIAN THREATENED SPECIES LISTING STATEMENT



Image by J. Patil, IFS ©

**Common name:** Pedder galaxias

**Scientific name:** *Galaxias pedderensis* Frankenburg, 1968

**Group:** Vertebrate, Chordata, Galaxiidae

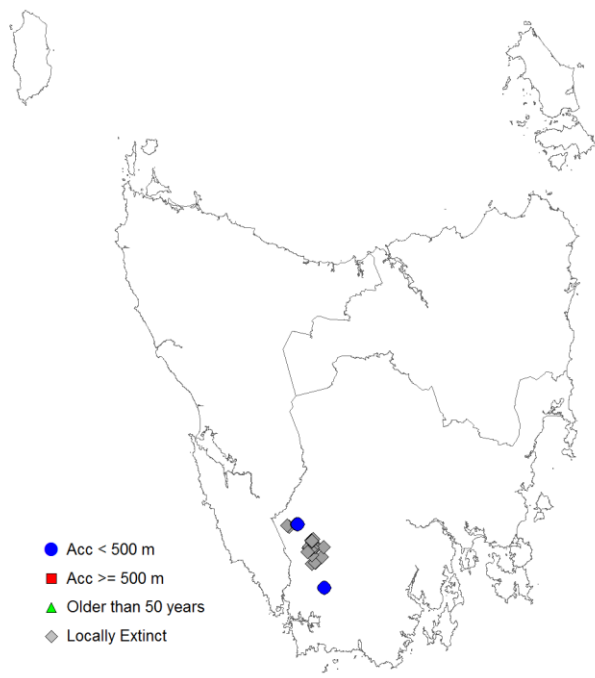
**Status:** *Threatened Species Protection Act 1995:* **endangered**

*Environment Protection and Biodiversity Conservation Act 1999:* **Extinct in the wild**

*IUCN Red List:* **Critically Endangered**

**Distribution:** Endemic status: **Endemic to Tasmania**

Tasmanian NRM Regions: **South**



**Figure 1.** The distribution of the Pedder galaxias, showing NRM regions

**Plate 1.** The Pedder galaxias (image by J. Patil, Inland Fisheries Service ©)

**SUMMARY:** The Pedder galaxias (*Galaxias pedderensis*) is a slender, medium-sized native freshwater fish growing to a maximum length of 170 mm. The species occurred in the original Lake Pedder and in streams and swampy pools around the lake. Following inundation of the lake for hydroelectric purposes, the Pedder galaxias initially increased in numbers, but numbers declined and eventually the species completely disappeared from the impoundment and from the remaining natural stream habitat surrounding the impoundment. Introduced brown trout (*Salmo trutta*) and the native climbing galaxias (*Galaxias brevipinnis*) are thought to have contributed to the extinction of the Pedder galaxias. The Pedder galaxias is now found only in two translocated populations in Lake Oberon and in the Strathgordon water supply dam.

The principal management objectives for the species are ongoing monitoring of translocated populations and possibly establishment of additional translocated populations.

#### IDENTIFICATION AND ECOLOGY

The Pedder galaxias (*Galaxias pedderensis*) is a member of the family Galaxiidae, one of the largest freshwater fish families in Australia (McDowall & Frankenburg 1981). The Tasmanian freshwater galaxiid fauna is particularly rich, with 16 species recognised in four genera (McDowall 1996, Hardie et al. 2006a). Galaxiid fishes are generally rather elongate tubular fish with (except in Tasmania's *Paragalaxias*) the single dorsal fin set well back on the body; there is no adipose fin nor any scales (McDowall 1996).

The family is widespread in southern cool temperate regions, with species present in southern Australia, New Zealand, Patagonian South America, South Africa, as well as a number of islands (McDowall 1996, Waters & White 1997). The family includes many migratory species with a juvenile marine phase (diadromous), with the remaining species being non-migratory (non-diadromous: without a marine stage in the life-cycle).

The Pedder galaxias is non-diadromous, spending its whole life in freshwater lake, swamp and stream habitats (Hamr 1992, Gaffney et al. 1992, Crook & Sanger 1997, TSS 2006).

The Pedder galaxias is a slender, medium-sized *Galaxias* species, growing to at least 170 mm. The colour of the upper body and sides is a light grey-brown with irregular dark blotches. Gold iridescence is often present on the back and sides. The lower surface is a grey-white colour (TSS 2006).

The Pedder galaxias is carnivorous and feeds primarily on terrestrial insects and aquatic insects and crustaceans (TSS 2006). Spawning occurs in spring, as water temperatures begin to rise. It is thought that the Pedder galaxias in the original Lake Pedder may have used stream habitat for spawning. In a captive environment, fish lay their eggs under flat rocks, aquatic vegetation and woody debris, with most batches laid in artificial stream habitats, although a few have been laid in a pond (Hamr 1992). Pedder galaxias mature at approximately 2 years of age and most appear to breed at 3–4 years of age and live for up to 6 years. Females produce a relatively small number (200–1200) of large-sized eggs (2.2–2.5 mm diameter). Eggs that were artificially fertilised after stripping took 22–30 days to hatch at 15–16°C. Larvae are approximately 10 mm long on hatching and in captivity fed on rotifers then small aquatic crustaceans (Hamr 1992).

#### SURVEY TECHNIQUES

The principal method for surveying for freshwater fish including the Pedder galaxias is electro-fishing. This technique requires specialist equipment and expertise and involves the use of an electric current passed through water to stun any fish present. When performed correctly, the sampled fish are largely unharmed. This technique should only be performed by trained specialists. Fyke netting is also being used more frequently to survey populations while night-time snorkelling is also used to survey Pedder galaxias populations (Hardie et al. 2006b). For more information on sampling the Pedder galaxias, please contact the Inland Fisheries Service.

**Table 1.** Current location summary for the Pedder galaxias

	Location	Tenure	NRM region*	1:25 000 mapsheet	Year established
1	Lake Oberon	Tasmanian Wilderness World Heritage Area	South	Razorback	1991-1997
2	Strathgordon water supply dam	Tasmanian Wilderness World Heritage Area	South	Strathgordon	2001-2002

\*NRM region = Natural Resource Management region; data from TSS (2006) and Inland Fisheries Service

### Confusing species

The Pedder galaxias is rather similar in appearance to the climbing galaxias (*Galaxias brevipinnis*), from which it differs in having a more bullet-shaped head with jaws of equal length rather than a dorsally-compressed wedge-shaped head with a distinctly undercut lower jaw. The Pedder galaxias also lacks the chevron-shaped markings on the side often seen in climbing galaxias and has relatively small pectoral fins rather than the large, rounded ones of the climbing galaxias (Hamr 1992). In addition, the Pedder galaxias is a fairly cryptic benthic species without the leaping and climbing habits of the climbing galaxias.

### DISTRIBUTION AND HABITAT

The Pedder galaxias is endemic to Tasmania. Before the inundation of Lake Pedder in 1972–1974, the Pedder galaxias occurred only in the original Lake Pedder and in-flowing streams and swampy pools near the lake (Andrews 1976). The original Lake Pedder was shallow (<3 m) with a predominantly sandy substrate. Inundation of the lake resulted in a very large and relatively deep (>20 m) impoundment. The steeper streams above inundation level were the only areas of natural habitat that remained unchanged after the flooding of Lake Pedder (TSS 2006).

Following inundation, the Pedder galaxias was present in large numbers in the impoundment during 1975–1980 and in some tributaries (Hamr 1992).

The species was also recorded in the McPartlan canal (TSS 2006). Surveys from 1988 to 1991 found the Pedder galaxias in only five streams (Hamr 1992, Crook & Sanger 1997). The last Pedder galaxias recorded within the species' natural range was caught in March 1996, with annual surveys continuing through until 2002 (TSS 2006).

A translocated population was established in Lake Oberon in the Western Arthur Range in the Crossing-Davey catchment by the introduction of 34 Pedder galaxias during 1991–1997. This population is now thriving, and the species also occurs in a smaller lake immediately downstream (TSS 2006). A number of Pedder galaxias have also been successfully translocated from Lake Oberon to the Strathgordon water supply dam, with the population now self-sustaining through natural recruitment (Chilcott et al. 2013).

### POPULATION PARAMETERS

There are thought to be no remaining extant populations of the Pedder galaxias in its original habitat. Both the Lake Oberon and Strathgordon populations are abundant and self-sustaining.

### RESERVATION STATUS

The Lake Oberon population is fully reserved within the Tasmanian Wilderness World Heritage Area, while the Strathgordon water supply dam population is managed by the Inland Fisheries Service for conservation of the Pedder galaxias.

## CONSERVATION STATUS

The Pedder galaxias was listed as endangered on the original schedules of the Tasmanian *Threatened Species Protection Act 1995*, at that time, it was considered perilously close to extinction with an estimated population of less than 50 individuals remaining. The species qualifies as endangered under criterion C2a: Total population estimated to number fewer than 2500 mature individuals and at least 90% of which occur in a single subpopulation.

Please note that this assessment was conducted under the previous version of the *Guidelines for Listing under the Threatened Species Protection Act 1995*, which has since been superseded by a newer version endorsed by the Scientific Advisory Committee (Threatened Species) in March 2023.

## THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

The cause of the extinction of the Pedder galaxias over its natural range in and around the original Lake Pedder and the Lake Pedder impoundment is unclear, but it is thought to be the result of competition and predation by introduced brown trout (*Salmo trutta*) and the native climbing galaxias (*Galaxias brevipinnis*). Potential threats to the translocated populations include genetic effects and illegal introduction of exotic fish.

**Loss of habitat:** The flooding of the original Lake Pedder resulted in the direct physical loss of habitat by inundation of the natural lake shorelines, swampy pools and lake tributaries utilised by the Pedder galaxias.

**Introduced brown trout:** Brown trout dispersed into the new impoundment, with the population increasing rapidly in numbers in the first decade after flooding. The brown trout population has since stabilised with large numbers of small trout now present. Competition and predation from brown trout is believed to be one of the principal causes of the decline and eventual extinction of the Pedder galaxias in its natural habitat (TSS 2006).

**Climbing galaxias:** The native climbing galaxias was reported from the Serpentine River prior to flooding, and like brown trout and the

Pedder galaxias also initially increased in numbers within the new impoundment. However, the climbing galaxias remained abundant and is now the dominant fish species in many of the streams flowing into the impoundment (Sanger 1988).

The climbing galaxias can probably out-compete the Pedder galaxias for space and food, and in combination with brown trout may have contributed to the decline and ultimate extinction of the Pedder galaxias in its natural habitat (Crook & Sanger 1997, TSS 2006, Chilcott et al. 2013).

**Introduction of exotic fish to translocated populations:** Any introduction of other fish species to the translocation habitats would threaten the populations of Pedder galaxias. Although such introductions are unlikely for Lake Oberon given the remoteness of the location, the more accessible Strathgordon water supply dam may be more vulnerable to this threat. As of 2013, three individual climbing galaxias have been found during routine monitoring of this population. Work to remove further specimens and prevent any further invasions is presently underway.

**Genetic effects:** A potential threat to the translocated populations of the Pedder galaxias includes genetic effects caused by the limited number of fish from which the population is derived (34 individuals in the case of the Lake Oberon population).

**Effects of translocation:** There is the potential for long-term effects of the introduction of the Pedder galaxias on the food chain within the translocation habitat which evolved without fish predation. The current abundance of the Pedder galaxias in Lake Oberon may represent a boom period, after which numbers may decline as food supplies are depleted.

## MANAGEMENT STRATEGY

### What has been done?

**Recovery planning:** There have been three Recovery Plans for the Pedder galaxias; Gaffney et al. (1992), Crook & Sanger (1997), and TSS (2006), which covered the period 2006 to 2010. Presently there is no current recovery

plan in place. However, the 2006–2010 plan serves as a guide to on-going conservation of the species.

**Targeted surveys & monitoring:** There have been a number of targeted surveys for the Pedder galaxias including Sanger (1988), surveys under the first two Recovery Plans (Gaffney et al. 1992, Crook & Sanger 1997), and a study by Hamr (1992) into the distribution and biology of the Pedder galaxias. Intensive electro-fishing surveys of the Serpentine-upper Huon Impoundment and tributaries were conducted annually by the Inland Fisheries Service until 2002, with the last Pedder galaxias captured in March 1996 (TSS 2006). The translocated population in Lake Oberon was monitored regularly until 2012 and the Strathgordon water supply dam is presently being monitored annually by the Inland Fisheries Service (Chilcott et. al 2013).

**Translocations:** A translocated population was established in Lake Oberon by the introduction of 34 Pedder galaxias during the period 1991–1997. A total 353 of Pedder galaxias have also been translocated from Lake Oberon to the Strathgordon water supply dam with a second population now established and being maintained by natural recruitment following extensive works to establish suitable spawning habitat.

**Captive breeding:** Limited success was obtained with captive breeding of the Pedder galaxias from 1990 to 1991 with only 11 juveniles produced (Hamr 1992). These were released with the translocated population into Lake Oberon. No attempts at captive breeding have been conducted since due to lack of breeding stock (TSS 2006).

**Public education:** The Pedder galaxias is included in a number of activities and educational products aimed at increasing public awareness of Tasmania's threatened galaxiids and their conservation needs.

### Management objectives

The primary management objective for the Pedder galaxias is to protect the translocated populations of the species, and to investigate

the potential for further translocations, if suitable sites are identified.

### What is needed?

- Provide information and extension support to relevant Natural Resource Management committees, local councils, government agencies, the local community and development proponents on the locality, significance and management of known subpopulations and potential habitat.
- To monitor the status of all translocated populations – continue to conduct monitoring of the Lake Oberon and Strathgordon water supply dam populations.
- To assist in conservation of the species – investigate the possibility of further translocations.
- To improve understanding of the species' genetic diversity – conduct research into the genetic structure and diversity of the two translocated populations.

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- Prepared** by Stephen Mallick and updated by the Threatened Species Section in 2020, under the provisions of the Tasmanian *Threatened Species Protection Act 1995*. Published 2023
- Cite as:** Threatened Species Section (2023). *Listing Statement for Galaxias pedderensis (Pedder Galaxias)*. Department of Natural Resources and Environment, Tasmania.
- View:**  
<http://nre.tas.gov.au/conservation/threatened-species/lists-of-threatened-species>
- Contact details:** Threatened Species Section, Department of Natural Resources and Environment, GPO Box 44, Hobart, Tasmania, Australia, 7001. Phone: 1300 368 550.
- [ThreatenedSpecies.Enquiries@nre.tas.gov.au](mailto:ThreatenedSpecies.Enquiries@nre.tas.gov.au)
- Permit:** A permit is required under the Tasmanian *Threatened Species Protection Act 1995* to knowingly “take” (which includes kill, injure, catch, damage, destroy and collect), keep, trade in or process any specimen of a listed species.