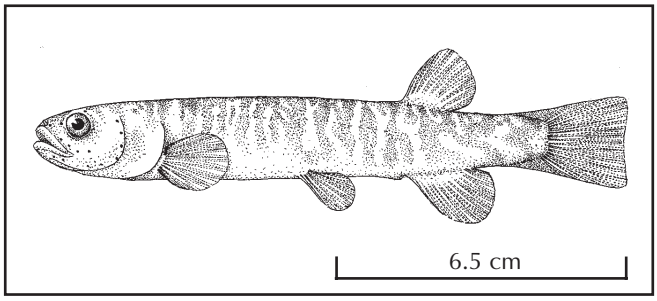
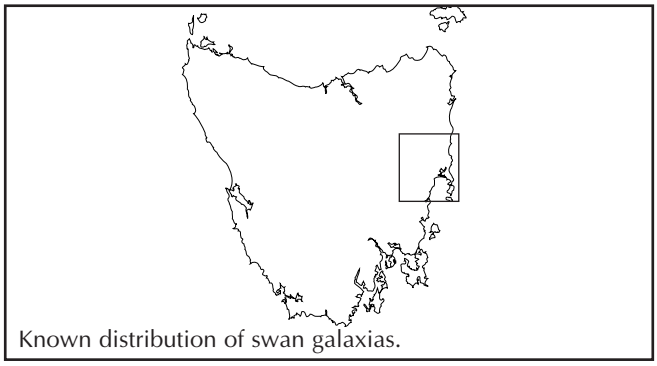
THREATENED SPECIES LISTING STATEMENT

Swan Galaxias, *Galaxias fontanus* Fulton 1978




Known distribution of swan galaxias.

Status

Commonwealth *Endangered Species Protection Act 1992*.....Endangered
Tasmanian *Threatened Species Protection Act 1995*.....Endangered

Description

The Swan galaxias (*Galaxias fontanus*) is a native freshwater fish that grows to about 130mm in length. Its colour fades from a dark olive-green on the back to grey-white on the underside. Pale brown speckling on the sides and back may form irregular bars and patches. The dorsal fin originates above the vent and the tail fin is slightly forked while the pectoral fins are relatively small and extend less than half way back to the pelvic fins. The fins are unmarked and the head is broad and flatish (Fulton 1990).

Swan galaxias spawn in spring within the normal adult habitat. Larval development lasts for at least five weeks and the larvae occupy shallow, slow flowing water in small schools. At around 35mm in length, the larvae begin to develop adult colouration. Typically, there are three year classes present in each population. Swan galaxias are opportunistic carnivores and feed upon a wide variety of land and aquatic insects (Fulton 1978, Sanger and Fulton 1991).

Distribution and Habitat

The Swan galaxias is endemic to Tasmania, found only in the Swan River and Macquarie River catchments of eastern Tasmania. The current distribution of the Swan galaxias is fragmented and it is not found within the distribution of the introduced brown trout (*Salmo trutta*).

The inability of Swan galaxias to survive in the presence of brown trout is shown by this distribution pattern. As the Swan galaxias was discovered after the widespread colonisation of brown trout throughout the Swan and Macquarie rivers, the original distribution of the species is unknown. However, it is likely that it was widespread within the two catchments before trout colonisation.

After its description from the Swan River in 1978, four natural populations of Swan galaxias were discovered in the headwaters of small tributaries of the Macquarie River (Sanger and Fulton 1991). Two of these populations have recently become extinct due to the spread of brown trout and redfin perch (*Perca fluviatilis*). Natural populations of Swan galaxias currently exist in the Upper Swan River and in Blue Tier Creek and Tater Garden Creek in the upper Macquarie River catchment. Nine translocated populations of Swan galaxias have been established in small streams within the Macquarie and Swan river catchments since 1987.

The Swan galaxias is the only species of endemic Tasmanian galaxiid that lives exclusively in freshwater streams. It is confined to the headwaters of small streams that are inaccessible to introduced fish species. Streams occupied by Swan galaxias are generally shallow with rocky bottoms and abundant instream and streamside vegetation.

Important Locations

All known populations of Swan galaxias, including translocated populations, are essential for the long-term survival of the species and require protection.

All of the streams listed below are important for the survival of the species.

Table 1: Swan galaxias populations: (n) natural population; (t) - translocated population.
All locations are in eastern Tasmania.

Stream	
Green Tier Creek	(t)
Rocka Rivulet	(t)
Coghlan Creek	(t)
Upper Blue Tier Creek	(t)
Blue Tier Creek	(n)
Tullochgorum Creek	(t)
St Pauls River	(t)
Upper Swan River	(n)
Dukes River	(t)
Cygnet River	(t)
Lost Falls Creek	(t)
Tater Garden Creek	(n)

Threats, Limiting Factors and Management Issues

The Swan galaxias is unable to co-exist with brown trout or redfin perch due to predation and/or competition with these species. The natural distribution of the Swan galaxias has become fragmented and is presently confined to three small populations in the extreme headwaters of a few streams. Two of the five natural populations discovered since the species was described have become extinct due to the spread of introduced fish.

Translocation
Due to the extremely restricted natural distribution of Swan galaxias and the ever-present threat of trout and redfin perch invasion, translocation is essential to ensure continued survival of the species. This program involves introducing the galaxias into waters not formerly occupied by them. Impact assessments and long-term monitoring are essential along with the support of the relevant landowners.

Water quality and streamside vegetation
Forestry activities within and upstream of the Swan galaxias range have the potential to adversely affect the species. Full consideration of this issue is necessary prior to any harvesting and actions are needed to ensure no damage to water quality occurs. Forestry Tasmania has established Wildlife Priority Areas which are managed to protect water quality for the species.

Dams
Damming of creeks which are Swan galaxias habitat can result in irreversible damage to the species. The galaxias need water flows and to be able to move up and downstream. This must be considered before any damming activities take place.

Conservation Assessment

Current status
After the Swan galaxias was first discovered in 1978, its already highly restricted range diminished even further. Two natural populations of Swan galaxias are known to have become extinct and another severely reduced. These localised extinctions were caused by the spread of brown trout and redfin perch into Swan galaxias habitats. Currently, the remaining natural distribution of the Swan galaxias consists of three populations occupying less than 8 km of narrow stream.

Since 1993, no further reduction in the natural range of the Swan galaxias has occurred. Ten translocations of Swan galaxias into small streams in the Macquarie and Swan River catchments have been attempted since 1987 and nine breeding populations have established. This number of populations may be sufficient to allow eventual downlisting of the species. However, whilst some of the translocated populations are thriving and number in the thousands, others are very small and are restricted to localised areas. The long-term viability of the natural and translocated populations of Swan galaxias must be established before formal reassessment of status is contemplated.

Assessment Criteria

The Swan Galaxias is listed as endangered under the Tasmanian *Threatened Species Protection Act 1995* because of a:

- Decline in population over the last 10 years and a continuing decline
- Restricted extent of occurrence
- Restricted area of occupancy

Recovery Program

A detailed study of the distribution, life history and environmental requirements of the Swan galaxias was conducted by the Inland Fisheries Commission (IFC) in 1987-89 with funds provided by the World Wide Fund for Nature. Arising from this study were a number of recommendations including listing of the areas containing natural populations of Swan galaxias as Forestry Tasmania Wildlife Priority Areas. In 1987, a number of Swan galaxias were transferred to the upper reaches of Blue Tier Creek to test the viability of translocation as a recovery action for the species. A breeding population soon established at the translocation site. Following the successful establishment of this population, two further translocations were attempted in 1991. In 1989, a small natural trout barrier in Blue Tier Creek was made more effective by increasing its height and slope. No trout have invaded the upstream part of the creek since the barrier was improved.

Based on the recommendations of Sanger and Fulton (1991), the first recovery plan for the Swan galaxias was prepared (Sanger 1993). Actions included in the recovery plan were further translocations, the construction of artificial barriers to introduced fish, monitoring of natural and translocated populations, the establishment of captive populations and an information and education campaign. The recovery plan outlined actions with funding requirements over a five year period. The IFC carried out the actions outlined in the plan and funding was provided by the Endangered Species Program of Environment Australia (ESP).

A second recovery plan has been prepared for the Swan galaxias to provide an updated series of recovery criteria and actions for the species (Crook and Sanger 1997). This plan details contributions over five years from sources including the IFC, ESP, Tasmanian Parks and Wildlife Service, volunteers and sponsors.

The objective of the actions outlined in the recovery plan is to improve the conservation status of the Swan galaxias so that it can be downlisted from Endangered to Vulnerable within five years. Recovery will be assessed against the following criteria:

1. At least 10 self-maintaining populations of the species should exist within five years. The minimum size of each of these populations should exceed a total of 500 adult fish.

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2. No further population declines or reductions in range should occur due to interactions with introduced fish over the next five years.

3. Detailed protocols for captive breeding of the Swan galaxias should be developed.

Actions Needed

The following recommended actions are outlined in the second recovery plan for the Swan galaxias.

Monitor natural populations
To ensure that the remaining natural populations remain viable and isolated from introduced fish species, regular electrofishing surveys should be conducted. Mark-recapture estimates of population size should be carried out and population structure examined.

Establish and monitor translocated populations
At present, nine translocated populations of Swan galaxias have become established. This number of populations meets the recovery criteria listed in the previous recovery plan for the species (Sanger 1993) and is sufficient to allow for eventual downlisting of the species. However, the long-term viability of the translocated populations must be proved before any formal attempt at downlisting. To achieve this, the translocated populations must be monitored regularly. A small number of new translocations should also be attempted if some of the populations are unstable or too small.

Captive breeding
A captive breeding program should be conducted to produce a manual outlining detailed methods for hatching and rearing threatened galaxiids in captivity. These methods may then be applied to the rearing and subsequent release of Swan galaxias in the future. They are also likely to be applicable to a number of other threatened fish species and will provide an opportunity to conduct research into the reproduction and behaviour of galaxiid fishes in general.

Habitat management
The habitats containing natural populations of Swan galaxias in the upper Swan River, Blue Tier Creek and Tater Garden Creek have been proclaimed Wildlife Priority Areas by Forestry Tasmania. Management of these areas regarding forestry practices involves minimizing stream sedimentation, allowing free movement of fish along the length of the streams, protecting streamside vegetation, protecting instream habitat and maintaining natural hydrological regimes.

All populations of Swan galaxias are situated above significant natural or man-made barriers to introduced fish. The integrity of these barriers needs regular monitoring. If introduced species invade habitats containing Swan galaxias, an assessment of the feasibility of removing them will be conducted. Any decision to attempt eradication of fish must take scientific, logistic and social issues into account.

Public information and education
The Swan galaxias should be included in a public information and education campaign to increase the profile of Tasmania's threatened galaxiids.

Source Material

References
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Specialist Advice
Stuart Chilcott, Inland Fisheries Commission

Review and Further Information

Statement prepared: September 1998

Prepared by: David Crook and David Andrews

Review Date: Expiry of current recovery plan or as new information is received.

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Permit It is an offence to collect, possess or disturb this species unless under permit from the Director, Parks and Wildlife Service and the Commissioner, Inland Fisheries Commission.