

# Water Management Review

## South Esk – Great Lake Catchment



### Key Issues

- *Threatened species*
- *Environmental flows*

### Related Studies

- *Upper Lake River*
- *Lake River*
- *Arthurs Lake*

### Contact Details

For further information  
please contact

Hydro Tasmania  
Environmental Services

Telephone:  
03 6230 5899

Facsimile:  
03 6230 5933

Email:  
[environment@hydro.com.au](mailto:environment@hydro.com.au)

Mailing address:  
GPO Box 355  
Hobart Tasmania 7001



Hydro Tasmania  
THE ENVIRONMENTAL WATER BUSINESS

## Technical Study – Upper Lake River Assessment

### The South Esk – Great Lake Water Management Review

The Upper Lake River Assessment is part of Hydro Tasmania's South Esk – Great Lake Water Management Review (SEGL WMR). The WMR program examines Hydro Tasmania's water management practices in each of its catchments. This assessment is one of 12 studies in the SEGL catchment. The studies were carried out following extensive identification of aquatic environment and water management issues, involving consultation with stakeholders throughout the catchment. The issues identified are documented in two reports: *Environmental Review: Great Lake – South Esk Catchment* and *Community Consultation Report: Great Lake – South Esk Water Management Review*. The outcomes from the technical studies will ultimately be incorporated into an Aquatic Environment Management Program for Hydro Tasmania.

### Issues Investigated

The issues investigated through this study include the presence of two endemic threatened fish species, the Saddled galaxias (*Galaxias tanycephalus*) and the Arthurs paragalaxias (*Paragalaxias mesotes*), and any requirements these species may have for sustained flow in the Lake River upstream of Woods Lake.

### Background and Information Gaps

The upper Lake River comprises less than 10 km of river channel between Arthurs and Woods lakes in the highlands of central Tasmania. The flow in the upper Lake River has been modified by the diversion of water from Arthurs Lake into Great Lake for generating electricity at the Poatina Power Station. There are no spills over Arthurs Dam into the upper Lake River, and although there is capability to release water via the dam, this has occurred very infrequently.

Prior to the construction of Arthurs Dam, the upper Lake River provided a connection between Arthurs and Woods lakes for native fish migration. Two native fish species, the Saddled galaxias (*Galaxias tanycephalus*) and Arthurs paragalaxias (*Paragalaxias mesotes*), are endemic to the area and limited in distribution to these two lakes. In the four decades since this riverine connection was broken, both species have persisted in Arthurs Lake, however *P. mesotes* is believed to have disappeared from Woods Lake.

Both Arthurs and Woods lakes contain populations of brown and rainbow trout, introduced for recreational fishing. These species are key predators of the native galaxiids. Both trout species use the upper Lake River for spawning when there is sufficient flow in the river during the spawning season.

It is not known how the upper Lake River is utilised by the galaxiid species, including whether it is used as spawning habitat. The possible flow requirements of the galaxiids and the interactions between migrating trout and dispersal attempts by the native fish species are also presently unknown.

## Technical Studies

### Aims

The objective of this study was to investigate whether native galaxiid fish species use, or attempt to use, the upper Lake River for dispersal, migration or other key life-cycle purposes.

### Assessment of Issues

The distribution of the Saddled galaxias and the Arthurs paragalaxias was assessed by sampling at a number of sites along the upper Lake River using fine-mesh, single wing fyke nets. This sampling indicated that, although Saddled galaxias occur in the lower reaches of the river near to Woods Lake, use of this habitat appears to be opportunistic and an artefact of natural dispersal movement rather than for specific habitat use or spawning. Analysis of the gut contents of brown trout sampled in the upper Lake River suggested that predation by trout is not inhibiting the Saddled galaxias from utilising the upper Lake River. Arthurs paragalaxias were not captured during the study, which is consistent with current evidence that this species no longer occurs in Woods Lake.

The data from this study suggests that the Lake River is not important habitat for the Saddled galaxias. However, it remains unclear whether the river represents important habitat for the Arthurs paragalaxias, if the species is still present in Woods Lake. Originally, the river would have provided a pathway for galaxiids to move between Arthurs and Woods lakes, though this may have been opportunistic, with animals swept downstream from Arthurs Lake during floods in the upper catchment. Under current conditions, this linkage is broken, apart from occasional releases from Arthurs Lake. Although the implications of this for the galaxiid populations in Woods Lake are unknown, the self-sustaining nature of the lake-based populations suggests that regular dispersal between the lakes is not essential to the continued survival of these species.

The flow regime in the upper Lake River has been altered as a result of Arthurs Dam. Local pickup in the river provides some seasonally variable flow, but the volume has been greatly reduced and the incidence and duration of zero flows has greatly increased. Vegetative encroachment by ti-tree has occurred as a result of flow reduction, resulting in a smaller stream channel. Year-round environmental flow releases for this stretch of river are considered to be of questionable benefit to the conservation of galaxiids in Woods Lake. Similarly, seasonal downstream dispersal releases from Arthurs Lake would not guarantee the re-establishment of *P. mesotes* in Woods Lake.

Current management of the upper Lake River does not appear to have created significant environmental problems, particularly in relation to the threatened galaxiids. The existing conditions facilitate spawning for the exotic trout, thus enhancing the recreational trout fishery of Woods Lake.

### Outcomes

No change to the current management of flow in the upper Lake River is proposed as an outcome of this study.