

Water Management Review

South Esk – Great Lake Catchment



Key Issues

- Environmental flows
- Threatened species
- Water quality
- Public use

Related WMR Technical Studies

- Trevallyn spills
- Trevallyn fish passage
- Tamar siltation

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Technical Study – Cataract Gorge Assessment

The South Esk – Great Lake Water Management Review

The Cataract Gorge 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 identified for review were environmental flows in Cataract Gorge, water quality deterioration during the summer months and its impact on public use and amenity, the presence of a threatened snail species in the gorge and its habitat requirements, and impediments to fish passage.

Background and Information Gaps

Cataract Gorge is located below Trevallyn Dam on the lower South Esk River. It is one of Launceston's tourist attractions, and is also popular with the local community for swimming, walking and other recreational activities.

The flows down the Cataract Gorge have been modified since the building of Trevallyn Dam in 1955, with much of the water from the South Esk River being diverted to Trevallyn Power Station, and discharged into the upper Tamar Estuary. While the base flow has been greatly reduced, the overall pattern of flows does not greatly depart from natural patterns in that frequent spilling from the lake occurs during seasonal flood peaking. While Hydro Tasmania currently maintains a year-round minimum flow down Cataract Gorge of 0.43 cumecs (m³/sec), this level of flow during the summer months may be insufficient to dilute the poor quality water being discharged to the South Esk River from Dalrymple Creek (which receives wastewater effluent from the Prospect area).

The provision of water for the environment, and for recreational uses and aesthetics in the South Esk River in Cataract Gorge, has long been a concern for stakeholder groups. A range of values, identified for the Cataract Gorge through a number of consultative processes, point to three key issues in terms of the provision of flows for the Cataract Gorge:

- an environmental or base flow that will maintain or enhance the habitat requirements of the aquatic fauna downstream of Trevallyn Dam and sustain the ecosystem into the future;
- identification of a flow that will maintain or enhance the current population of the threatened snail species (*Beddomiea launcestonensis*); and
- flows that will enhance recreational water use and public amenity within Cataract Gorge through mitigation of present factors that degrade water quality.

Technical Studies

Aims

From the information gathered during the environmental review and community consultation stages, it is clear that management should focus on achieving water quality sufficient to support and sustain recreational use of the waterway and facilities located at the First Basin, as well as providing river flow and water quality that is adequate to sustain biological processes into the future. The aims for the study were:

- to assess the environmental flow requirements for aquatic fauna downstream of Trevallyn Dam;
- to determine the habitat preference and availability for the threatened snail *Beddomeia launcestonensis*; and
- to determine flows that would alleviate water quality degradation in the Gorge, while enhancing visual aesthetics and amenity and not endangering recreational users.

Assessment of Issues

A comprehensive program was carried out to characterise the present state of water quality and river flow in Cataract Gorge, examine the current population status and distribution of the Cataract Gorge snail (*Beddomeia launcestonensis*) and determine environmental flow options that are likely to result in an improvement in environmental condition and visual aesthetics in the river. The study found that during prolonged periods of low flow in summer, there is extensive growth of nuisance filamentous algae and periodic blooms of hazardous blue-green algae that is encouraged by nutrient concentrations in the river below Trevallyn Dam. Water quality monitoring showed that water entering the South Esk River from Dalrymple Creek contains very high levels of nutrients due largely to discharge of effluent from the Prospect Vale wastewater treatment plant. The ponds associated with this treatment plant have also been shown to be the source of faecal bacteria and blue-green algae, both of which have caused periodic closure of the First Basin to swimming due to the human health risks.

From the biological data that was collected, it is apparent that reduced flows and poor water quality are impacting on the health of the aquatic macroinvertebrate community. The study also determined that the current riparian discharge of 0.43 cumecs is inadequate and likely to be leading the poor health of the aquatic community. Modelling of changes in habitat availability within the Gorge suggested that an increased environmental flow of 1.5 cumecs would provide benefits for aquatic biota, including the Cataract Gorge snail (*Beddomeia launcestonensis*), as well as providing significant public amenity and aesthetic improvements. The results from the modelling also suggested that flows in the river in excess of this are likely to create an increased risk for swimmers and bathers, who often utilise swifter reaches of the river upstream from First Basin.

The study also showed that the distribution of *Beddomeia launcestonensis* is primarily restricted to Cataract Gorge, although specimens were found in very low densities under boulders in Lake Trevallyn. Although searches were made in similar habitat in the North Esk River at Corra Linn, no specimens were found. In Cataract Gorge, *B. launcestonensis* was only consistently found in cryptic habitats, and these included:

- the underside of boulders, lifted by hand and/or crowbar;
- in sheltered backwaters and/or channels adjacent to the main channel;
- on rock surfaces in crevices between large boulders or bedrock slabs;
- in water-filled scour holes adjacent to the channel.

Snails were detected in highest densities in the latter two habitats, both of which are characterised as low velocity environments. It appears that the distribution and abundance of *B. launcestonensis* within Cataract Gorge is firstly determined by the availability of refuges from high flows, provided that these refuges do not suffer from siltation during low flows. Within these habitats, the abundance of *B. launcestonensis* may be limited by interaction/competition with other, highly abundant snails, most of which are 'pollution tolerant' and appear to be favoured by the environmental conditions which predominated under the existing low flow regime.

Outcomes

While there were a number of options that might assist in managing issues in Cataract Gorge, the single most effective option for improving the status of most of the issues under consideration was an increased release of flow from Trevallyn Dam. Hydro Tasmania will therefore increase the discharge from Trevallyn Dam from 0.43 cumecs to 1.5 cumecs (37 to 130 ML/day) and monitor its effectiveness for a 5 year period. This will result in a significant increase in the area of habitat available for aquatic biota, through dilution reduce the impact of pollution, and result in significant aesthetic improvements throughout Cataract Gorge. It must be noted that while this increased flow does reduce the impact of discharge from Dalrymple Creek, efforts should continue to be made to improve the quality of water being discharged into Dalrymple Creek from the wastewater treatment plant.