

State of Rivers Report for the Duck River Catchment

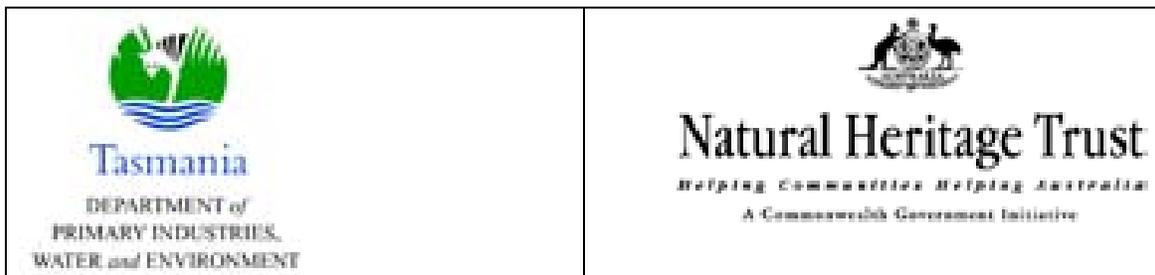


Water Assessment and Planning Branch
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Cover Photo: Duck River at Poilinna Road

The Department of Primary Industries, Water and Environment

The Department of Primary Industries, Water and Environment provides leadership in the sustainable management and development of Tasmania's resources. The Mission of the Department is to advance Tasmania's prosperity through the sustainable development of our natural resources and the conservation of our natural and cultural heritage for the future.

The Water Resources Division provides a focus for water management and water development in Tasmania through a diverse range of functions including the design of policy and regulatory frameworks to ensure sustainable use of the surface water and groundwater resources; monitoring, assessment and reporting on the condition of the State's freshwater resources; facilitation of infrastructure development projects to ensure the efficient and sustainable supply of water; and implementation of the *Water Management Act 1999*, related legislation and the State Water Development Plan.

List of Contents

This document contains the results of a series of co-ordinated studies by the Department of Primary Industries, Water and Environment (DPIWE) which were conducted in the catchment of the Duck River between 1999 and 2001. These studies, which are detailed below, form the basis of the 'State of Rivers' report for rivers in the Duck River catchment.

Executive Summary

Provides a brief overview of the catchment, a summary of the major activities and water uses within the catchment and a brief and integrated summary of the major findings from the various study components. This document also makes some comment on issues for management and any future work that may be required to enhance knowledge about particular problems that were raised by these studies. For more detailed summaries of findings related to particular study components, see individual study reports (listed below).

Water Quality in the Duck River Catchment

Parts 1 – 4
(70 pages)

Hydrological Analysis of the Duck River Catchment

(9 pages)

Aquatic Ecology of the Duck River Catchment

(40 pages)

Index of River Condition for the Duck River Catchment

(41 pages)

Executive Summary

Located in north-west Tasmania the Duck River, Deep Creek and Scopus Creeks provide the major drainage into Duck Bay. The Duck River originates at an elevation of 200m above sea level and flows in a westerly then northerly direction before discharging into Duck Bay at Smithton. The catchment has a gentle gradient, trending from low hills to undulating plains and river terraces. As a consequence of the topography many of the low lying agricultural regions are prone to flooding during the winter months and therefore agricultural drainage techniques such as “Hump and Hollow” have been used to drain excess water from the land during wetter periods. The river provides water for domestic, stock and other agricultural uses and also supports recreational activities such as fishing and canoeing. In addition, Duck Bay supports a significant aquaculture industry based on shellfish production, and floods in the Duck River often transport faecal bacteria into the bay causing temporary closure of shellfish leases.

As part of catchment planning initiated by the Circular Head Council, a comprehensive study of rivers in the catchment was undertaken from 1999 to 2002 by the Department of Primary Industry, Water and Environment with financial assistance from the Natural Heritage Trust. This project was carried out as part of the State’s commitment to ‘State of River’ reporting for rivers around Tasmania, which has the aim of providing current information for the better management of waterways and water resources. This information is also used for planning and implementing catchment management and regional natural resource management, for providing baseline information for water management planning and information to community groups engaged in river rehabilitation activities. This study was undertaken in partnership with the Circular Head Council who supported bacteriological monitoring and North West Regional Water Authority who provided water quality information from Deep Creek water supply intake.

There were a number of significant findings from studies undertaken as part of this ‘State of River’ report. These are outlined below;

- During the period of the study, flow in the Duck River was significantly less than the long-term average (24%), however this was interrupted by a significant flood event in July 2000 which had annual exceedence probabilities of about 1 in 50 years. Monitoring of water quality in the river at Scotchtown showed that this major event transported more than 3000 tonnes of suspended sediment, 125 tonnes of nitrogen and 60 tonnes of phosphorus. Based on monitoring at this location on the Duck River, catchment export coefficients for nitrogen and phosphorous were calculated (1.67 kg/mm/km^2 and 0.532 kg/mm/km^2 respectively) and these are at the upper end of the range for catchments in Tasmania. These figures, along with the high turbidity levels that were recorded throughout the catchment, are likely to reflect the impact of a combination of factors including, high rainfall, intensive dairy farming, extensive drainage activities, bank and river bed destabilisation caused by unrestricted stock access and a lack of riparian buffering.
- Although the overall health of the aquatic macroinvertebrate community in the Duck River (as indicated by AusRivAS ‘river health’ scores) does not appear to have been significantly impaired by the elevated concentrations of nutrients and turbidity that were recorded, the poor water quality in the middle and lower reaches of the river has caused a major change in the composition of the macroinvertebrate community towards taxa that are more pollution tolerant. Sensitive fauna that occur at sites in the headwaters of the catchment are rapidly lost once rivers and streams enter the area of agricultural activities. A similar situation was found at many sites located on tributary streams, although at a number of locations (Birthday Creek, Faheys Creek and Lairds Creek) water quality and habitat degradation appear to have resulted in lower river health scores. At some of these, habitat degradation took the form of heavy siltation and bank erosion caused by unimpeded stock access, while at others (eg Faheys Creek) the presence of instream dams may be responsible for the poor river health scores.

- The assessment of river condition highlighted the impact that poor riparian zone management has had on streamside habitat. The results of this assessment clearly showed that there within the agricultural and urban areas riparian vegetation was sparse or completely absent and in many cases had been replaced by weeds such as Crack Willow and Blackberry. This was particularly severe in many of the tributaries, where substantial sections of some streams have been altered to function as drainage channels (Geales Creek, Edith Creek and Whitewater Creek). Along with the impacts that unimpeded stock access cause in these streams, these alterations are likely to be significantly contributing to the poor water quality and high nutrient loads being measured in the Duck River.
- During the study, fish kills in Scopus Creek occurred and this prompted further investigations which determined that pH in this stream periodically fell to very low levels (< 3). Subsequent investigations in the Mella area found that this was a result of the exposure of acid sulphate soils in this small drainage system, and it was postulated that the exposure of these soils was due to periodically high local groundwater extraction. Acid sulphate soils are likely to occur in Togari, Montagu, Marcus and the Brittens Swamp Areas, and further investigation of this issue is proposed.

Recommendations

It is evident that riparian (stream-side) zone management is a significant issue for agricultural and urban areas within the Duck catchment. The findings from this study indicate that the widespread removal of riparian vegetation and the extensive replacement of these by weed species such as willows (*Salix fragilis*) and blackberries (*Rubus fruticosus*), along with uncontrolled stock access to riverbanks are river and catchment management issues that need addressing. Given the level of dairy farming in the catchment and the potential nutrient load this generates, serious consideration should also be given to improving the management of drainage channels as these facilitate the transport of soil and nutrients from the catchment. Better management of these issues is likely to have a beneficial impact on catchment water quality and nutrient export loads entering Duck Bay.

Areas with poor riparian condition should be the target of rehabilitation activities while management measures should be considered to provide future protection of areas that are undisturbed or are of high conservation value. Better management for ground water extraction and monitoring of groundwater is also regarded as important in reducing the environmental threat of acidic drainage in the Mella area.

Decreasing agricultural run-off, effectively managing sewerage and stormwater systems and addressing leachate from buried industrial waste are also positive measures that could be taken to improve waterway health in the Duck catchment. Such measures will greatly improve water quality and in-stream habitat for a suite of aquatic fauna with overall benefits for the whole aquatic ecosystem.