



DEPARTMENT *of*
PRIMARY INDUSTRIES,
WATER *and* ENVIRONMENT

Tasmania

**State of Rivers Report
for the Brid River Catchment**

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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 Brid River catchment during 1998. These studies, which are reported below, for the basis of the 'State of Rivers' report for rivers in the Brid catchment.

Executive Summary

Provides a brief summary of the major findings of each study and makes recommendations on any future work which may be required to enhance knowledge about particular problems and direct management of resources.

(3 pages)

Water Quality of the Brid River

Report Series WRA 99/09

(54 pages)

Hydrological Analysis of the Brid River

Report Series WRA 99/16

(10 pages)

Aquatic Ecology of Rivers in the Brid Catchment

Report Series WRA 99/17

(16 pages)

Index of River Condition for the Brid Catchment

Report Series WRA 99/18

(32 pages)

Executive Summary

Brid River State of Rivers Report - 1999

As a result of the need for water resource information by Landcare groups and Dorset Council for the purposes of catchment management planning, a comprehensive study of rivers and streams in the Brid catchment was undertaken in 1998 by the Department of Primary Industries, Water and Environment. This was carried out as part of the State's commitment to 'State of River' reporting for rivers around Tasmania, which aims to provide current information for the better management of our waterways and water resources. This information is also seen as vital for water management planning and establishing water quality objectives under the 'State Policy for Water Quality Management'. This study was undertaken in partnership with the Dorset Council and with assistance from the Dorset Waterwatch group which has been active in the area since 1994. The major outcomes of the study are presented below.

Water Quality

Although some water quality parameters indicate that conditions in the Brid River are reasonably good, high turbidity and nutrient concentrations are evidence that there is significant transport of nitrogen and phosphorus towards the bottom of the catchment. While water quality is moderately impacted in the upper catchment, in the middle lower sections of the Brid River, water quality shows some improvement as it passes through area of State forest. During stable baseflow conditions, this is most easily demonstrated by changes in pH and turbidity.

Dissolved oxygen concentrations throughout the length of the river are good and indicative of a healthy ecosystem. Lower summer concentrations occur in the upper reaches of the river and may reflect the nutrient inputs to the river in that area. During summer sampling, bacterial concentrations were highest at sites in the upper catchment, where animal access to the river is an issue.

Continuous monitoring of turbidity at the bottom of the catchment has shown that levels during floods can get as high as 150 NTU, which is 10 times greater than those which occur during baseflow conditions. Measurement of phosphorus, nitrogen and suspended solids during floods allowed export loads to be estimated. During 1998 it was calculated that 925 tonnes of sediment, 2.2 tonnes of phosphorus and 38 tonnes of nitrogen were lost from the Brid catchment. Compared with other Tasmanian catchments so far studied, loss of nutrients and sediment from this catchment is high.

The major issue arising from the data collected during this study is that activities in the upper catchment are having the most significant impact on water quality in the Brid River. The most apparent issues appear to be lack of management of runoff from intensively farmed land and a lack of riparian buffering of the river. Implementation of better riparian management practices have been singled out as one positive step which could be made towards improving water quality in the Brid River.

Hydrology

The Brid River is a class 4 river unregulated stream which has tributary streams that are heavily impacted by on-stream storage's. The annual median flow is 0.918 cumecs and summer median flow is 0.475 cumecs. The average annual rainfall range for the catchment is 700 - 900 mm. There is an average (last 10 years) summer (December to March) off-take of water for

irrigation purposes of approximately 500 megalitres. There is a strong seasonal pattern to river flows, with lowest flows occurring between January and April. The minimum recorded flow in the lower Brid River is 0.09 cumecs, while the maximum recorded flow is 58.3 cumecs.

During the study, all months apart from October experienced less flow than the historical average. This was especially marked during the six months from March to August, when flows were up to 45% less than the historical record. This indicates that in general terms the study was conducted in drier than average conditions.

Flood frequency analysis was performed for the lower Brid River. During the present study a moderate flood occurred on September 23rd, which had a peak flow of approximately 19.17 cumecs (corresponding to a river height of approximately 1m in the lower reaches). From the results of the analysis, it can be concluded that a flood of this magnitude corresponds to an approximate annual exceedence probability (A.E.P.) of 1:2 to 1:3.

Flow recession curves were also given for the lower Brid River. These curves illustrate how the water storage in the river decreases over time following high river flows, and essentially reflect groundwater discharge to the river and how groundwater storage influences and sustains flows in rivers. This information has implications for the establishment of environmental flow allocations for the Brid River and for the assessment of risk in supply of water from the river for purposes such as irrigation and domestic use. Such risks will also need to be taken into account during the Water Management Planning process to be carried out as part of the currently proposed water reforms.

River Condition

The Index of River Condition (IRC) provides an index of change from what is regarded as a natural state. The index is composed of a number of sub-indices relating to hydrology, water quality, physical stream form, streamside habitat and ecological health. The results presented in this study provide a summary of the current catchment condition and can be used as a benchmark for future comparison.

Field data for IRC was collected at 27 representative sites within the Brid River catchment; 14 on the main-stream Brid River and 13 on tributary streams. An examination of the overall condition ratings for both tributary and main-stream lengths reveals no section with a high or major modification to condition. But conversely there are no sections of river in the catchment that rate as essentially natural. Over 44% of the main-stream has some modification to condition while 55% is near natural and all of these latter sites are located in the lower section of the river. The very top site on the mainstream was assessed as near to natural. For the tributary streams 23% fall into the category of near natural condition, while the majority (77%) show some modification to condition.

Analysis of sub-indices reveals that the major degradation occurs in the area of the streamside zone and physical form. The condition assessment for hydrology and water quality was moderate. Aquatic fauna (freshwater invertebrates) rated as in good condition overall. Some modification to the hydrology of the catchment indicates that summer extraction is significant at a number of locations. Significant degradation of physical stream form is evident in a number of areas. Major disturbance to the catchment is evident in the riparian zones where significant habitat disturbance has been detected in about 70% of the catchment sites. Management issues include the existence of extensive riparian weed species, unvegetated or poorly vegetated riparian zones, and uncontrolled stock access to river banks.

It is clear that riparian (streamside) zone management is a significant issue in the Brid River catchment and should be a focus of catchment management activities to avoid further degradation. The maps included in this report provide information to allow a strategic approach to the implementation of programs to address this situation.

The IRC suggests that the majority of sites within the catchment vary away from a natural state to a moderate degree although some stretches are bordering on major modification. Sub-indices provide additional information with regard to specific features of each location and suggest a range of management issues for the future.

Aquatic Ecology

The Brid River and its tributaries are home to a number of threatened species including the Giant Freshwater Crayfish *Astacopsis Gouldi*, and an undescribed species of hydrobiid snail in the genus *Beddomia*. Threats to these species include habitat degradation, deterioration in water quality and, in some cases, competition with introduced species.

The aquatic community in the Brid River is in good condition with 10 of the 14 sites sampled in the main river receiving an unimpaired or better rating. The tributaries are in fair condition with 6 of the 10 sites sampled receiving a slightly impaired rating. The impaired sites are impacted by factors other than water quality, however some sites appear to undergo periodic deterioration in water quality, particularly during periods of low flow.

Fifty genera of algae were recorded from the Brid catchment. The number of genera of algae recorded per site ranged from 16 to 21 with little variation between autumn and spring sampling rounds. The composition and diversity of the algal communities are characteristic of healthy, unimpacted streams.

Recommendations

The results clearly show that the condition of the waterways and of the water resource in the Brid catchment is slightly to moderately impacted, although there is evidence that the macroinvertebrate community is relatively healthy despite this. There is clear evidence from several of the studies that impacts on the river are greatest in the upper half of the catchment, where intensive agriculture and water extraction is most concentrated. Issues which have been highlighted are the prevalence of riparian weeds, unvegetated or poorly vegetated riparian zones and relatively uncontrolled stock access. Improved management of the riparian zone is the major recommendation arising from this report, and efforts to encourage this should be given a high priority.

The level of nutrient and sediment loss from the catchment is also seen as an important issue. The retention of nutrients and soil on the land provides many benefits, including conservation of productive land and minimisation of farm costs associated with fertiliser application. The benefits to the environmental health and condition of the river is obvious and the estuary at Bridport would also benefit from reduced sediment input. Increased awareness of soil conservation and better soil management practices will go a long way to rectifying this, and measures to control the movement of soil from cultivated pasture will also help to ensure the long term future of farming in the area.

Disclaimer

This report has been prepared with due diligence and care, and is based on the best available information at the time of publication. The Department of Primary Industries, Water and Environment holds no responsibility for any errors or omissions within this report. Any decisions made by other parties based on the information in this report are solely the responsibility of those parties.

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