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

Tasmania

State of Rivers Report for Rivers in the Great Forester Catchment

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Executive Summary

The Great Forester River State of Rivers Report - 1999

Due to the initiation of catchment planning for the Great Forester catchment by the Dorset Council and the need for resource information for input into the water management plan for the Great Forester River, a comprehensive study of rivers in the 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, with the aim of providing current information for the better management of our waterways and water resources. This information is also seen as vital for the planning and implementation of catchment management plans. 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

Various strategies for collecting water quality information in the Great Forester catchment were employed during 1998. Monthly monitoring, 'snapshot' catchment surveys and flood sampling were the main techniques used. Water throughout the catchment was found to be dilute, having very little dissolved salts, and generally acidic (pH levels less than 6.5). Turbidity levels during stable baseflow periods was low, but increased by as much as 300% during flood events. Highest turbidity was measured in the middle reaches of Tuckers Creek during 'snapshot' surveys in both summer and winter.

Both phosphorus and nitrogen concentrations were highest in the Great Forester River near Tonganah. The data indicates that most of the river's nutrient load is entering the river from the upper catchment, where greatest agricultural activity occurs. Nitrate nitrogen was found to be a large component of the total nitrogen concentration in the upper river.

Faecal coliform levels were measured during 'snapshot' surveys in summer and winter. The results showed that faecal contamination was generally greater during summer, when higher water temperatures enhance the survival of bacteria in the rivers. Tuckers Creek showed highest coliform levels of all sites sampled during 'snapshot' surveys.

While the concentration of most heavy metals were at or near the limits of detection by laboratory analysis, aluminium concentrations at some sites were found to be as high as 300 - 400 µg/L. Although these high concentrations may simply reflect the influence of the surrounding granite geology, further study may be required to determine any possible impacts of this on the aquatic biota.

Hydrology

Monthly flow analysis shows that highest flows occur between July and September, when average flow in the river generally exceeds 3 m^3s^{-1}. Lowest flows in the river occur between January and April, when average flows are generally less than 0.5 m^3s^{-1}. Flow recession analysis, which demonstrates how the river storage capacity decreases over time, was performed for the Great Forester River 2km upstream of Forester Road. The data clearly demonstrated that that flood recession varies on a seasonal basis. During winter, river flows recede to about 2 m^3s^{-1} within 8 days of floods exceeding 10 m^3s^{-1}. During summer, the

recession curve shows that flows 8 days after a moderate flood event are much lower (< 0.5 m^3s^{-1}). Although not confirmed, it seems possible that this difference could be explained by the presence of either 2 ground water storages or the presence of a significant upper soil storage providing additional base flow in winter.

Comparison of flows during the study period (1998) with the historical record (28 years of record at the station 2km upstream of Forester Rd) showed that for all months except September and October, flows were less than the historical monthly average. For the months March to August, flows were markedly less than the historical record.

Analysis of flood frequencies in the Great Forester River was also performed and examination of the flood which occurred on September 23rd 1998, which had a peak flow of about 62 m^3s^{-1}, showed that a flood of this magnitude has a 15% - 30% chance of occurring in any given year. This corresponds to an annual exceedence probability (A.E.P.) of 1:5 to 1:7.

River Condition

This report presents a broad picture of stream condition throughout the Great Forester catchment based upon a ground survey of representative sites. This method, which is known as the Index of River Condition (IRC) is based on similar habitat survey approaches being employed in Victoria and Queensland. The IRC method includes a number of rating factors which have yet to be fully tested in Tasmania, and this report forms part of the investigations into the suitability of these ratings to the State.

Field data was collected from 34 representative sites on rivers and streams in the Great Forester catchment; 17 on the main-stream Great Forester River and 17 on tributary streams. Over 50% of the main stream sites were found to be in near or essentially natural condition, while 38% are slightly modified. For tributary streams about 61% fall into the category of near natural condition while about 20% show some modification and a similar percentage are essentially natural. From these figures it can be concluded that the general condition of the catchment is reasonably healthy.

Analysis of the sub-indices shows that there is some degradation in water quality and aquatic fauna (freshwater invertebrates), however there is significant degradation of physical stream form and major disturbance of the riparian zone at about 30% of the sites investigated. The data showed that most of the critical problems for streams occurs in the stream side zone. The main management issues which were identified include extensive riparian weed species, un-vegetated or poorly maintained riparian zones and uncontrolled stock access to river banks.

The IRC suggests that the majority of sites within the catchment vary away from a natural state by no more than a moderate degree. Sub-indices provide additional information with regard to specific features of each survey location and suggest a range of management issues for the future. These include land use and riparian management practices, water quality and water quantity. It is clear that the major issue in the Great Forester catchment is riparian zone management and this area should be a focus for catchment activities to avoid further degradation. Maps included in the report provide information to allow a strategic approach to the implementation of programs to address this situation.

Aquatic Ecology

Data from the First National Assessment of Riverine Health (FNARH) was used to establish the aquatic health of several rivers in the Great Forester Catchment. This program has been collecting information on the aquatic macroinvertebrate and freshwater algal communities, both of which are currently being used as indicators of environmental health in rivers across the Nation.

Macroinvertebrates

In general the Great Forester River and tributaries are in good health, particularly in the middle and upper catchment. In the lower reaches of the main river, several sites showed that aquatic health was either moderately or severely impaired. The majority of tributary sites indicated that aquatic health was unimpaired or slightly impaired. In most cases where sites were found to be impaired, it appears that impacts are due to habitat degradation rather than water quality. Sites that have been sampled on more than one occasion have shown fluctuation in river health ratings, which suggests that the macroinvertebrate communities at these sites may be responding to periodic deterioration in water quality.

Algae

Samples of freshwater algae were collected from 4 sites in the Great Forester catchment in autumn and spring of 1997. Taxonomic analysis identified 68 genera of algae, including Diatoms, Green algae, Blue-green algae and Euglenoids. These species are common throughout Tasmania and as such pose no public health risk.

Lowest numbers of species were recorded from the Arnon River and Kamona Creek and may be a result of nutrient limitation in these streams. In contrast, high numbers of algal taxa were found in the Great Forester at Ten-mile Track and Tuckers Creek and tend to correspond with higher nitrogen concentrations and areas which are subject to intensive agricultural activity.

Endangered Species

Four endangered aquatic species are listed as having distributions in the Ringarooma catchment. The best known of these is Astacopsis gouldi (the Giant Freshwater Crayfish) which is listed as “vulnerable” under Tasmanian Threatened Species Protection Act 1995.

Two aquatic hydrobiid snails are also listed as endangered. Beddomia briansmithi has been sampled from the Fern Creek and Beddomia minima from a small un-named stream near Scottsdale. The survival of hydrobiid snail populations primarily depend on the retention of native riparian vegetation and maintenance of good water quality.

Galaxiella pusilla (Dwarf Galaxiid) is also currently rare due to a limited distribution at unprotected sites. Important management considerations include retention of riparian vegetation, maintenance of water quality and flow regime and decrease in sediment input from roads and drainage of swamps.

Summary of Findings

One of the major issues arising from the data presented in these four technical reports is the impact of riparian activities on water quality and condition of the Great Forester River and its tributaries. While the aquatic community appears to be unaffected or only slightly affected in most parts of the catchment, where impairment has been identified the cause appears to be

linked to habitat degradation. Surveys using the Index of River Condition have supported this conclusion.

In terms of resource management and use, the focal issue arising from these reports is riparian use and management. There appears to be a significant body of data suggesting that better management of the riparian zone would provide a range of benefits in terms of improved water quality, ecological integrity, environmental sustainability and protection against erosion and streambank degradation. Limiting stock access directly to rivers and streams in the catchment should be encouraged as this will provide the greatest benefits in both the short and longer term.

There is also some evidence that nutrient enrichment of the Great Forester River is occurring primarily in the upper part of the catchment where agricultural activity is most intense. While further data may be required to pinpoint the source and pathway through which nutrients are entering the river in this area, immediate action to reduce this input could nevertheless be undertaken through implementation of best farm practice. Minimisation of direct runoff from land to waterways, better soil management and use of buffer strips around streams and drains will help to trap nutrients before they enter the drainage system.

Finally, it is anticipated that the information presented in this 'State of Rivers' report will contribute in a positive way towards better and more sustainable management of the water resources in the Great Forester catchment.