Executive Summary

Ringarooma State of Rivers Report - 1999

Due to the initiation of catchment planning for the Ringarooma River by the Dorset Council and the need for environmental information for input into the water management plan for the Ringarooma, 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

Many of the water quality variables measured show that the quality of water in the Ringarooma catchment is very good. Most of the rivers in the catchment are characterised by clear and dilute water with healthy dissolved oxygen levels, while most rivers are relatively acidic (average pH between 5.4 and 6.5).

Data collected during the study showed that most of the nutrients and faecal coliform input to Ringarooma River comes from the middle part of the catchment (between Ringarooma and Derby) where the majority of intensive agriculture occurs. It appears that most of this enters via tributaries such as Legerwood Rivulet, the Dorset River and the New River which showed the highest nutrient levels, and may lead to elevated concentrations of these in the main river.

During catchment 'snapshots' for heavy metals in summer and winter of 1998, it was found that dissolved aluminium concentrations may be high in the Wyniford River and may pose some risk to the aquatic environment in this river and possibly downstream in the Ringarooma River. The concentrations of most other metals appears to be at or below the limits of detection.

Sampling during a significant flood on September 23rd showed that turbidity in the Ringarooma River was 100 times higher than baseflow conditions, while nutrient concentrations were up to 10 times greater. At Moorina, instantaneous loads of suspended solids, nitrogen and phosphorus being transported down the river during the peak of the flood were estimated at 261 t/hr, 1.7 t/hr and 0.35 t/hr respectively. Corrected for catchment size, this translates to yields of 431 kg/km^2, 2.75 kg/km^2 and 0.6 kg/km^2 respectively. This data has implications for sediment and nutrient management in the upper catchment.

Hydrology

Monthly flow analysis shows that highest flows occur between July and September, when average flow in the river exceeds 10 m^3s^{-1}. Lowest flows in the river occur in the period February to April, when average flows are generally less than 3 m^3s^{-1}. Flow recession analysis, which demonstrates how the river storage capacity decreases over time following a high flow event, was performed for the Ringarooma River at Moorina. The data indicate that once the flow in the river recedes to 8 m^3s^{-1}, it takes approximately 19 days to return to a baseflow of only 2 m^3s^{-1}.

Comparison of flows during the study period (1998) with the historical record (21 years of record at Moorina) showed that for all months except October 1998, flows were less than the historical monthly average. For the months January, April, May and August, flows were markedly less than the historical record.

Analysis of flood frequencies in the Ringarooma at Moorina was also carried out and examination of the flood which occurred on September 23rd 1998, which had a peak flow of about 145 cumecs, showed that a flood of this magnitude has a 20% to 30% chance of occurring in any given year. This corresponds to an annual exceedence probability (A.E.P.) of 1:3 to 1:5 year event.

River Condition

An assessment of the 'condition' of the Ringarooma River and many of its tributaries was carried out during the study. The concept was developed with a view to supplying a simple descriptive format that could provide a rapid qualitative assessment of river condition at specific sites and representative reaches. The basic presumption is that the report provides suitable data to illustrate the overall health of a number of representative reaches throughout a catchment.

The Index of River Condition (IRC) uses a number of sub-indices based upon physical form of the river channel, streamside vegetation, water quality, aquatic life and hydrology. The sub-indices are then weighted and combined to form the overall IRC. This represents a categorisation of each sampling site against conditions which would be expected at the site if it were unimpacted or "natural".

The majority of the 15 sites assessed on the main-stream Ringarooma River were slightly impacted but in a state of near natural condition. The data further indicates that there are few instream faunal problems, water quality is reasonable and physical form is largely unimpacted. Although there are excessive amounts of sediment in the river, and this may have been exacerbated by mining practices in the past, the level of effect of this in the river system at the moment was not able to be investigated during this study. The streamside zone sub-index indicated that this zone was where most of the critical problems occurred in the main river.

Most of the critical problems for tributary streams also occurs in the stream side zone. There are few instream faunal problems, water quality is reasonable and hydrology is largely unimpacted. The Physical form sub-index varied considerably indicating that there are physical problems associated with many of the catchment tributary streams. More elevated tributary sites were generally less impacted than sites on the lower reaches, where most agricultural activities occur.

Aquatic Ecology

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

Macroinvertebrates

In general the Ringarooma River and its tributaries are in good health, with most sites classified as unimpaired on the majority of sampling occasions. There is evidence to suggest that some

sites undergo periodic episodes of slight impairment which may be due to either habitat degradation or periodic deterioration in water quality. Periods of low flow and elevated nutrient inputs into reaches in the form of runoff from agricultural land practices upstream or stock access to streams may be the major cause of impairment at sites such as Dunns Creek and the New River, both of which seem to be least stable in terms of community health.

Algae

Algal sampling was also undertaken in 1997 and 56 genera of algae were identified from sites in the Ringarooma catchment, including Diatoms, Green algae, Blue-green algae and Euglenoids. These species are common throughout Tasmania and as such pose no public health risk. The lowest numbers of species were recorded from the relatively undisturbed tributaries in both the upper and lower catchment. In contrast, high numbers of algal taxa tend to correspond with rivers that have high nitrogen and are subject to intensive agricultural activity and unrestricted stock access. Sites on these rivers include the New River at Pera Flats Road, Legerwood Rivulet at the Tasman Highway and the Ringarooma River at Mutual bridge.

Rare and Threatened 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 fromensis* has been sampled from the Frome River and *Beddomia tasmanica* from the Weld River. 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.

Recommendations

The results clearly show that the condition of the waterways and the water resource in the Ringarooma catchment is generally good, however some recommendations for further work can be made. While the main river is in good condition, is ecologically healthy and has good water quality, it is clear that most of the nutrient and faecal input to the river system is through the tributaries in the upper half of the catchment. It is these smaller streams and rivers which are also impacted by land use practices which have produced slightly to moderately degraded streamside zones. The variation in the aquatic ecosystem health in these areas also supports this conclusion. It is recommended that any further studies or planned remedial activities take place in these areas, particularly the Dorset, New and Legerwood rivers.

The other major feature highlighted in these reports is that there appears to be elevated dissolved aluminium concentrations in the Wyniford River. Further investigation into the source and toxicity of this dissolve aluminium is required to assess any potential threat this has to the health of aquatic organisms in the lower Wyniford and Ringarooma rivers.

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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