

DRAFT

REGIONAL NRM STRATEGY DEVELOPMENT

FRESHWATER ECOSYSTEMS

NORTH WEST REGION

1. Overview of the issue in the Region

The freshwater ecosystems of the Northwest Region are highly diverse, ranging from pristine alpine, rainforest communities, paperbark and blackwood swamps, wet eucalypt forests through to remnant floodplain swamp gum communities.

The following data is very approximate, but provides a rough indication of overall river condition. The figures are calculated using a bio-naturalness indicator developed as part of the RFA. Eighty-three percent of the Region's stream lengths are in a natural condition. Whilst the World Heritage Area contributes to this figure, its exclusion only drops the proportion to 77%. However, there are significant areas of floodplain that have been converted to agricultural land, resulting in the loss riparian vegetation, degradation of stream channels and loss of wetland areas. Fourteen percent of the Region's non-WHA stream lengths occur in land that can longer be regarded as natural and 8% of the non-WHA stream lengths can be found in disturbed natural areas. It is often the case that in these areas the health of the rivers and wetlands is significantly impaired. The proportion of degraded and disturbed rivers is likely to be significantly higher once all formal reserves are removed from the calculations.

Some other key issues and characteristics of the Region include:

- There are approximately 330 kilometres of river reserves in the Region (this does not include formal reserves such as National Parks, Conservation areas and WHA).
- The Region contains one Ramsar wetland (Lavinia Nature Reserve, King Island) and 17 DIWA (Directory of Important Wetlands in Australia) listed wetlands.
- The World Heritage Area is significant for its diverse and often unique (both nationally & internationally) freshwater environments and the geomorphic and ecological processes that characterise them.
- The Region has the highest proportion of any Region of rivers listed on the WildRivers database.
- The Region supports the largest remaining populations of the world's biggest freshwater crustacean, the State and federally listed giant freshwater crayfish. The abundance of healthy rivers and streams further supports 15 of Tasmania's 25 native fish species including the State and federally listed Australian grayling and the dwarf galaxias.

- The Region is an important area, both at the State and national levels for Sphagnum peatlands. Recent fires in NSW have demonstrated the need to protect these unique ecosystems within Tasmania.
- The Region contains the most significant stands of paperbark and blackwood swamp forests in the State.
- Recreational angling provides millions of dollars annually to the Region with all of its associated spin-offs. The rivers of the NW are famous for their significant whitebait runs that in turn support a healthy sea run trout fishery. The lakes in this Region provide anglers a chance to target all three of the trout varieties available to anglers in Tasmania.

2. Current asset condition

Systematic information on the condition of rivers and wetlands in the Region is poor, and often anecdotal. A recent workshop (Dunn 2002), using the condition of riparian vegetation as an indicator of river health showed that in the King Bioregion (NW tip and King Island) they are in good average condition but have a declining trend; Northern slopes (central north coast) riparian vegetation is on average in a degraded state and continuing to decline; Central Highlands Bioregion, riparian vegetation is in good condition and remaining static; and riparian vegetation in the West Bioregion is in good condition and remaining static.

Rivercare plans produced for the Region indicate that rivers and wetlands are often in poorest condition on the lowland, floodplain environments of the Region. Native riparian vegetation is often absent and where it is found is usually reduced to small fragmented patches. Willow, hawthorn and gorse make up a significant proportion of the riparian zone. The lack of riparian vegetation is often consistent with a degraded aquatic environment and channel degradation through streambank and bed erosion.

Of the 17 DIWA wetlands listed for the Region, the condition of five is either degraded or fair, whilst the condition for six of those wetlands is thought to be declining. There are at least six of the DIWA wetlands that lack sufficient information on either their condition or status.

There are an additional 59 wetlands in the Region that are regarded as being significant, but are not included on existing lists. Of these wetlands, there are 28 wetlands in near pristine condition (static trend 78%; declining trend 4%; unknown trend 18%), 21 wetlands in good condition (static trend 19%; improving trend 5%; declining trend 67%; unknown trend 9%), 4 wetlands in fair condition (improving trend 25%; declining trend 75%). It should be noted that many of the near pristine wetlands occur in the World Heritage Area.

There are 62 plant species and 42 fauna species listed on the schedules of the *Threatened Species Protection Act 1995* that occur in freshwater systems in the Region (Attachment1 tables 1 & 2). These figures are approximations as they

represent only the available data, and consequently there may be more species than currently recorded. The giant freshwater crayfish is well known in the Region and has a stable but fragmented population but threats still exist from poor land/waterway practices as well as poaching.

To date 247 sites have been assessed as part of the river health program using aquatic species composition and habitat as surrogates for stream health (AUSRIVAS). Of these, 68% were assessed as being equivalent to reference (unimpaired) or above, 25% of sites were significantly impaired, 5% were severely impaired and 2% of sites were impoverished (see attachment 1, table 3).

3. Issues associated with, or threats to the asset

Impacts to freshwater systems often affect both the physical and biological functioning of the system. The following section is separated into physical and biological issues, however they should be regarded as being linked. For example, clearing native vegetation leads to bank instability and stream bank erosion which in turn results in turbidity that can lead to loss of aquatic habitat and a reduction in water quality.

Biological Issues

Woody weeds, willows (*Salix* sp.) in particular, infest extensive areas of the river systems in the North-west. Willows are highly invasive, spreading largely by vegetative means and are able to invade both streambanks and channel areas. In the Region willows impact on the diversity and abundance of macroinvertebrate fauna, reduce native plant diversity and affect the physical hydrological functioning of the river. Willows are found on major rivers (and their tributaries) such as the Mersey River, Don River, Leven River, Forth River, Inglis River, Duck River and Rubicon River.

There has been an extensive loss of native riparian and wetland vegetation as a consequence of land clearing. Significant vegetation communities such as paperbark and blackwood swamp communities, which include both stream and wetland environments, were cleared until recently, when statewide controls on the clearing of trees came into effect. The negative impacts associated with the clearing of riparian vegetation are well known and include the loss of terrestrial habitat, degradation of aquatic habitat (loss of shade, increased temperatures, decrease in organic inputs), streambank instability, increased threat of invasion by weeds, and a reduction of water quality (increased turbidity, eutrophication).

Introduced fish (eg redfin perch) and crustacean species (eg. mainland yabbie) pose a significant threat to native species. It also is important that strategies also exist to deal with potential threats from species that could be introduced into the future. These threats include a range of introduced plant species and fauna pests, such as carp and gambusia.

Agricultural land uses have measurable impacts on aquatic organisms and their habitat. The AUSRIVAS models were successful in detecting those impacts, although there was great seasonal variation in the model outputs. These differences could reflect seasonal differences in the degree of disturbance and/or changes in hydrology.

Roads, cleared land, tilled areas and stock access are sources sediment that can blanket stream substrate and limit available habitat. Nutrients, fertilisers, pesticides and herbicides can be major pollutants in rural areas. In addition, river health degradation is exacerbated in rivers stressed by high water demand during the irrigation season (December to April). Low flows, coupled with elevated nutrient levels can lead to increased plant and algal growth. Macrophytes provide an important habitat and food source for macroinvertebrates and can promote an increase in their numbers.

Forestry operations can result in increased stream sediment load, changes in channel form, changes in stream hydrology and a variety of changes in stream faunal populations and communities. In forestry, enhanced streamside reserves are routinely applied to protect fauna. The Forest Practices Code provides for the maintenance of adequate buffer widths along rivers to protect the aquatic environment and maintain channel stability.

Dams have also been shown to have a significant impact on both riparian and aquatic environments through habitat alteration and changes in flow patterns. For example, a large proportion of dam affected stream sites (6 sites sampled) were in the highly impacted C band of biological impairment with losses of up to 80% of taxa. The bands range from reference-site quality (A) through to sites that have impoverished species compositions (B).

Acid mine drainage has impacted upon the majority of test sites on the west coast. Streams receiving acid mine drainage from point source or diffuse sources have a very low abundance and diversity of stream fauna.

Physical processes

Many parts of river systems are naturally erosive environments, however erosion can be greatly accelerated by human activities. The two major issues affecting the geomorphology of river systems on a large or catchment scale are (1) river regulation, including extraction and diversion and (2) land use, including land clearance.

River regulation, either for electricity generation or water supply, may have a range of geomorphological effects depending on the precise nature of the change to the hydrological regime. Those effects may include altering sediment supply regimes which may lead to streambed or bank erosion, degradation of channel and floodplain landforms that are maintained by flooding and alterations to the water table and associated hydrological regime.

There are a number of biological and physical issues related to land management activities, including:

- ***Extensive clearing of woody weeds*** if undertaken with unrealistic timeframes and without appropriate follow-up (such as stock control and revegetation) can result in bank instability, erosion and turbidity.
- ***Inappropriate removal of stream timber*** (woody debris) can lead to a loss of in-stream habitat and erosion of the streambank and streambed. In the past large quantities of stream timber were removed to improve the hydraulic capacity of the stream, however, recent studies have shown that most timber found within a river has nil or negligible impact on flooding (Rutherford *et al* 2000).
- ***Stream channelisation*** has been occurring for a number of decades under the guise of “river improvement”. Channelising streams effectively shortens the length of the stream and results in erosion of the streambed and banks.
- ***Poor design and inappropriate use of instream structures*** such as riffles, weirs and dams can create barriers to fish passage, causing population fragmentation. Such structures can also be highly susceptible to failure and in some cases worsen the problem by contributing to erosion. For example the once common whitebait runs have been greatly affected by weirs and other barriers.
- ***Gravel extraction*** can lead to streambed and bank erosion.
- ***Drainage of wetlands*** has a dramatic impact on their condition and ecology. Wetlands can be drained directly, and are often then converted to other uses, or indirectly by changes to the catchment characteristics or groundwater interactions.
- Threats to ***groundwater dependent ecosystems*** threats include over pumping and over development of the groundwater resource which can lower the water table below critical root zone depths, de-water habitat, reduce flow to streams and wetlands, and impact on water quality values which are critical for ecosystem health.

4. Current responses to issues and threats

Rivercare Planning

Rivercare planning has been an important tool in developing strategic, priority based approaches to the management and rehabilitation of rivers in the Region. Appendix 2 summarises the plans in the Region.

Conservation of Freshwater Ecosystem Values Project

The Conservation of Freshwater Ecosystem Values is an important initiative with the aim of identifying freshwater conservation values for the State’s rivers and associated land. It will provide a range of management opportunities to protect significant aspects of Tasmania’s freshwater ecosystems.

Legislative responses

The *Water Management Act 1999* focuses on the management of water as a resource and is targeted largely towards water management planning, licensing of dams, wells and levees and the establishment of districts such as irrigation, drainage and Riverworks. The *Water Management Act* allows for the establishment of Riverworks Districts which provides a framework for formal management and maintenance arrangement for works that have been undertaken along rivers. This is particularly useful for community groups and can be established in partnership with council.

The *Land Use and Planning Approvals Act 1993* (LUPAA) provides an avenue of regulation through planning schemes. The Forest Practices Code implements the environmental protection provisions of the *Forest Practices Act 1985* and limits activities including timber harvesting in proximity to streams. Recent changes to the *Forest Practices Act* restrict the clearing of trees along streams, which are classed as vulnerable land. In this situation, where timber harvesting or clearing was formerly permitted a Forest Practices Plan will generally be required.

The Inland Fisheries Service (IFS) is in the process of drafting a Translocation Policy. Information is being sourced from all Australian States and Territories regarding current policies so that the intended Translocation Policy will be consistent with national protocols and aligned to the 'National Policy for the Translocation of Live Aquatic Organisms 1999'.

River Regulation

Proposed dams and water storage developments are assessed and approved by the Assessment Committee for Dam Construction (ACDC) Hydro Tasmania has embarked on a processes of water management reviews, a catchment by catchment review of its water management practices throughout Tasmania. Significant progress has been made on review of the Great Lake – South Esk system, but review of electricity supply catchments in the North West Region has not yet commenced.

5. Productive use and other opportunities in relation to the Asset

Tasmania's freshwater systems underpin a whole range of economic, social and environmental opportunities and uses.

Recreational angling provides millions of dollars annually to the Region with all of its associated spin-offs. The rivers of the Region maintain a significant commercial eel industry, and whitebait runs that in turn support a healthy sea run trout fishery. The lakes of the Northwest provide a wilderness trout fishing experience that is internationally renowned. It is clear that by improving the condition of the Region's rivers and wetlands, and in particular maintaining those areas still in good condition, there is enormous potential for tourism and a range of recreational pursuits, such as fishing.

Better management of Tasmania's freshwater systems should lead directly to improvements in stream condition and water quality and a reduction in associated costs. This includes significant levels of expenditure for rehabilitation works, water treatment and continuous, local and catchment scale, maintenance of rivers. The Region's proximity to the wilderness areas of Western Tasmania means it is ideally placed to take advantage of its significant natural values in developing a world class ecotourism industry.

6. Available data and usefulness

The usefulness of available data is variable. There are a number of databases, such as threatened species, GTSpot, and the Aquatic Ecosystems database which are continuously updated. Other data sets are structured in such a way as to be useful only in very broad terms.

Onground Works Database – Rivercare Program

This database is currently being developed by DPIWE's Rivercare Section and will consist of data relating to onground works (fencing, weed control, revegetation, in-stream works) carried out under the NHT Rivercare Program. The data is to be linked to GIS and should provide a strategic overview of what has occurred at the statewide level.

TasVeg Mapping

Provides vegetation mapping for the State. However, riparian vegetation is not adequately mapped.

National Land and Water Resources Audit

The Land and Water Audit provides an indication of the status and condition trends for significant wetlands in Tasmania.

Fluvial regionalisation

This is an important project that has developed a fluvial regionalisation for the State. The results of this project can be used to make informed and strategic decisions about the management, conservation and rehabilitation of rivers in Tasmania (Jerie *et al.* 2003).

DPIWE databases

DPIWE maintains a number of relevant databases including the Threatened Species Database, the GeoCon database and GTSpot (species distributional database).

Threatened Fauna Manual

The Forest Practices Board maintains the TFM, which includes distributional and locality data for forest dependant threatened species, including riverine species.

Rivercare plans

Rivercare plans provide some relevant NRM related data, but their usefulness varies, depending on when and how they were developed. The more recent plans tend to follow a multi-disciplinary approach and can be quite useful documents.

Aquatic ecosystems

AUSRIVAS will form the basis of ongoing national reporting obligations on river ecological health. The River Health program, which uses this protocol, maintains a significant data set related to aquatic environments and their health.

7. Information gaps and actions required to fill gaps

There is a need to continue, and improve on the stream characterisation process started in the Mersey River and Don River series of Rivercare Plans. Such characterisations require a biophysical approach (biological, geomorphological and hydrological) to assessing the stream character, its condition and management.

There are many ecological and geomorphological processes that are not clearly understood, but have the potential to affect or be affected by resource development in the Region. These include:

- The role of flooding to maintain ecological and geomorphological processes.
- The impact of stream regulation through dams or other structures on biophysical processes, including threatened species, is poorly understood in the Tasmanian context.
- Impact of acid drainage on riparian and aquatic systems.

A framework for defining geomorphic river regions in Tasmania has been developed (Jerie *et al.* 2003). There is now a need to test the framework more widely, allowing it to be refined, and then complete the geomorphic regionalisation of Tasmania. Physical and hydrological processes underpin the functioning of rivers and the geomorphic regionalisation will provide a valuable foundation for making informed decisions about the management and rehabilitation of Tasmania's rivers in the future.

While the 'State of Rivers' program has provided a comprehensive assessment of river health at the catchment scale, the spatial coverage of this work in the NW to date is limited to the Duck, Montagu, Inglis, Flowerdale, and to a lesser extent the Welcome and Mersey river catchments. Further studies of this nature to cover other catchments in the NW should be encouraged.

Current modelling to detect impacts flow regulation and regimes on macroinvertebrates needs refinement to be able to detect more than just extreme hydrological variations (flood/drought), but be more sensitive to flow related impacts.

The current AUSRIVAS habitat assessment does not provide an adequate benchmark of river condition. The development or adoption of a methodology to characterise physical in-stream habitat and river condition remains one of the key challenges facing DPIWE in its water assessment activities. Currently under the Monitoring and Evaluation Framework for Natural Resource Management, a river condition indicator has been developed that collectively assesses river health and physical river condition (in-stream habitat and riparian vegetation condition).

There is little useful information on groundwater dependent ecosystems. Some work has occurred in forestry operation areas which might provide baseline data and there has been ongoing work in karst systems on reserved land (see issues paper on GeoConservation).

8. Current aspirational, resource condition, and management action targets for the asset (at the national, State and/or regional level) and any data on progress towards targets

Tas Together – Goal 21.1 To improve the planning system to value the environment (indicator 1.1)

Tas Together – Goal 22.1 To maintain or improve natural heritage including biodiversity, geodiversity and landscapes (Indicators 1.1, 1.2, 1.3, 1.5)

Tas Together – Goal 23.4 To achieve sustainable and appropriate land use (indicators 4.1, 4.2, 4.4).

Tas Together – Goal 24.1 To limit conversion of land with native vegetation (indicator 1.1)

Tas Together – Goal 24.7 To maintain and enhance the productive capacity of soil and water (indicators 7.1, 7.2).

Tas Together – Goal 24.9 To reduce the adverse impacts of pests, weeds and pathogens (indicator 9.1)

Tas Together – Goal 24.10 To maintain the Tasmanian wilderness resource and improve its quality (indicator 10.1)

Tas Together – Goal 24.11 To optimise public use of the natural environment consistent with maintaining environmental values (indicator 11.1)

National Monitoring and Evaluation Framework Targets)

“Resource condition indicators” are being finalised at a national level. Below are three relevant “matters for target”, with selected “indicator headings”:

- Inland Aquatic Ecosystems Integrity:
 - Wetland ecosystem extent and distribution;
 - Wetland ecosystem condition
 - River condition
- Significant Native Species & Ecological Communities:
 - Selected significant native species and ecological communities extent and conservation status
- Ecologically Significant Invasive Species;

- Selected ecologically significant invasive vegetation species extent and impact
- Selected ecologically significant invasive vertebrate species extent and impact

Tasmanian Nature Conservation Strategy

- Improve protection for freshwater environments. As a priority, identify and establish freshwater CAR reserves and complete integrated catchment planning for natural resource management (Actions 15, 47).

9. Proposed Management Action Targets for the issue

- Provide multi-disciplinary technical and scientific support for river management, conservation and rehabilitation initiatives to stakeholders (Regional Committee, councils, community groups, landowners).
- Maintain the Rivercare Planning process at the regional level as an essential component of Rivercare Projects and other development-based projects.
- Develop partnerships between local and State government, including Forestry Tasmania and Hydro Tasmania, to ensure that natural assets along rivers are properly managed and protected.
- Establish a baseline monitoring program that includes reference sites in undisturbed catchments or river reaches and in sites earmarked for rehabilitation to focus on integrated approaches to stream management and rehabilitation.
- Establish a program for the ongoing assessment of the condition and management requirements of the Region's freshwater natural resources, in particular those that are considered to be of significant value.
- Develop partnerships among stakeholders (the Regional Committee, State and local government, and funding bodies) to undertake research, development and extension on key river conservation, management and rehabilitation issues, in particular those that have relevance at the national level.
- Establish an awareness program targeting key industry groups on issues of river and wetland management, & how they can contribute to their management and protection.
- Incorporate river and wetland management, conservation and rehabilitation into integrated property planning processes.
- Incorporation of AUSRIVAS training into professional regional extension services training to increase the monitoring capacity of the River Health Program.
- Utilisation of Rivercare and Catchment Plan development to improve the coverage of monitoring programs such as AUSRIVAS.
- Establish a database of all instream barriers to fish passage in the Region, for the purpose of management and habitat restoration.
- Detailed survey to assess the status, condition and threats to groundwater dependant ecosystems for the NW Region.

10 Relevant scientific publications

Bryant S. and Jackson J., (1999) *Tasmania's Threatened Fauna Handbook : what, where and how to protect Tasmania's Threatened animals*, Department of Primary Industries, Water and Environment.

Cassidy M.,(2003) *Waterwatch Tasmania Reference Manual*, Waterwatch Tasmania Department of Primary Industries, Water and Environment.

Connolly A. and Tanner Z., (1998) *An assessment of revegetation on a difficult coastal site - Port Latta NW Tas*, Department of Primary Industries, Water and Environment.

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Green, Graham, (2001) *North-west rivers environmental review :A review of Tasmanian environmental quality data to 2001*. Supervising Scientist Report 167 Supervising Scientist, Darwin.

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Gouldthorpe, J. and Gilfedder L., (2002) *Bioregional Summaries of the Biodiversity Component of the National Land and Water Resources Audit – Nature Conservation Branch Technical Report 02/07*, Department of Primary Industries, Water and Environment.

Gutteridge Haskins and Davey Pty Ltd (1995) *Catchment Management Plan for Pet and Guide Reservoirs* for the Burnie City council.

Jerie, K., Houshold, I. and Peters, D. (2003) *Tasmania's river geomorphology: stream character and regional analysis (2 vols.)*, Nature Conservation ranch, Department of Primary Industries, Water and Environment. (and reference list therein).

Johnson K. and North A (1996) *Swamp forest proposed reserves: botanical survey, report to Circular Head District*, Forestry Tasmania.

Kirkpatrick, J.B. and Gilfedder L.A., (1999) *Tasmanian Bushcare Toolkit*, Department of Primary Industries, Water and Environment.

Krasnicki T., Pinto R. and Read M., (2001). *Australia wide Assessment of River Health: Tasmania Program Final Report*, Department of Primary Industries, Water and Environment. Technical Report WRA 01/2001.

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Rivercare plans and associated reports in the North West Region

Duck Catchment Rivercare Plan, Leanne Rabjohns 2001

Inglis River and Associated streams, D. Armstrong 1999

Leven River Gunns Plains - Rivercare Plan, Gunns Plains Land Care Group

Don River Rivercare Plan & Initial Works Plan, D. Armstrong & D .Sprod 2002

Mersey River Rivercare Plan, D. Armstrong & D. Sprod 2000

Mersey River Rivercare Plan 4 – Lower Mersey, D. Armstrong & D. Sprod 2000

Figure of 8 Creek Rivercare Plan, A. Ford 2000

Bishton Creek Rivercare Plan: Willow/weed removal Bass Hwy Devonport-Sorell Upgrade, DIER Aniela Grun 2001.

Montagu River Rivercare Plan 2002 Montague R Catchment Management Group 2002

Rivercare Plan; Welcome River and Catchment Management. Group, Krushka and Rabjohns

Mersey Catchment – Natural Resource Management Plan, D. Armstrong & D. Sprod 2000

Mersey River flow and catchment assessment, Mersey River Working Group 1998
Clayton Wetland Management Plan, Coastcare 2001
Montagu River Catchment Management Plan, Sinclair Knight Marz 1999
Welcome River Catchment Management Plan, Thompson and Brett 1999
Welcome River Phase 1 - Preliminary Report, ID&A 2001
Report on Geomorphology of the lower Welcome River, I. Houshold & K. Jerie 2001

Rivers & Water Supply Commission

The Black & Detention Rivers - Tasmanian Water Resources Survey
The Don River - Tasmanian Water Resources Survey

Useful Compact Disks

A process fro rehabilitating Australian streams 2001, Land and Water Australia
Native Vegetation Research Reports 2001, Land and Water Australia

ATTACHMENT 1

Data Tables

Threatened riparian flora and fauna statistics

Table 1. Threatened flora species in found in rivers and wetlands in the NW NRM Region

| Status | Threatened Species Protection Act 1995 | Environment Protection and Biodiversity Conservation Act 1999 |
|------------|--|---|
| Endangered | 1 | |
| Vulnerable | 9 | |
| Rare | 51 | |
| Extinct | 1 | |
| CRITICAL | | 1 |
| ENDANGERED | | 3 |
| VULNERABLE | | 1 |

Table 2. Threatened fauna species in found in rivers and wetlands in the NW NRM Region

| Status | Threatened Species Protection Act 1995 | Environment Protection and Biodiversity Conservation Act 1999 |
|------------|--|---|
| Endangered | 2 | |
| Vulnerable | 3 | |
| Rare | 37 | |
| CRITICAL | | 0 |
| ENDANGERED | | 0 |
| VULNERABLE | | 4 |

Table 3. Condition of sites in the NW NRM region.

| Band Label | % of sites n=247 | Band Name | Comments |
|------------|---------------------|------------------------|--|
| X | 15% | Richer than Reference | <ul style="list-style-type: none"> • More families than expected • Potentially biodiverse site • Possible mild organic enrichment |
| A | 53% | Similar to Reference | <ul style="list-style-type: none"> • Index value within range of the central 80% of reference sites |
| B | 25% | Significantly Impaired | <ul style="list-style-type: none"> • Fewer families than expected • Potential mild to moderate impact on water quality, habitat or both, resulting in the loss of families |
| C | 5% | Severely Impaired | <ul style="list-style-type: none"> • Considerably fewer families than expected • Loss of families due to moderate to severe impact on water and/or habitat quality |
| D | 2% | Impoverished | <ul style="list-style-type: none"> • Very few families collected • Highly degraded |

| | | | |
|--|--|--|--|
| | | | • Very poor water and/or habitat quality |
|--|--|--|--|

Attachment 2 Rivercare Plans for the NW NRM Region including comments on plans

| Rivercare Plan | Year | Coverage | Comments |
|--|------|---|--|
| Welcome River RCP | 2000 | Most of the Welcome River | Identifies a range of NRM issues (threatened species, flooding, weed management) however is limited in its strategic approach with regards contemporary river planning approaches. This plan is linked to the Welcome River CMP. |
| Inglis River RCP | | Inglis River, Flowerdale Creek, Camp Creek. | Not an integrated RCP has limited application in term's contemporary river planning approaches. |
| Mersey Rivercare Plan (includes separate plans for each of the coverages). | 2000 | Upper Mersey; Middle Mersey, Lower Mersey, Dasher River and Minnow Creek. | Priority based plans that provide a strategic approach to river management and rehabilitation. Lack required workplans for onground works; require updating in term's biological conservation data. |
| Leven River RCP | 2000 | Middle reaches of Leven River, around Gunns Plains Valley | Plan provides an integrated approach to onground works, contains only limited Natural resource information relevant to the area (basic fish, flora, water quality data). |
| Duck Catchment River RCP | 2001 | Blackwood Bridge, Lades Road, Coppers Creek, Deep Creek | Plan documents on-ground activities and has some limited NRM information. Lacks the strategic priority setting framework of contemporary river planning approaches. |
| Montague River RCP | 2002 | From the confluence of the Duck river to the estuary | Identifies some key management issues but lacks the strategic priority setting framework of contemporary river planning approaches. Linked to Montague River CMP. |
| Don River RCP | 2002 | Don River, Melrose Ayres, Aitken, Coal, Whitehawk, Yaxley and Norfolk Creeks | Strategic, priority based Rivercare plan with some onground works planning completed. |
| Mersey River RCP1 – Upper Mersey | 2000 | Upper Mersey | See comments for Mersey Rivercare Plan. |
| Mersey River RCP2 – Dasher-Minnow | 2000 | Dasher and Minnow Rivers | See comments for Mersey Rivercare Plan. |
| Mersey River RCP4 – Lower Mersey overlaps | 2000 | Figure of 8 Creek, Bonneys Creek, Caroline Creek, Redwater Creek, Dasher and part of Minnow | See comments for Mersey Rivercare Plan. |

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