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CFEV Assessment of the North West Bay River Catchment

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The Department of Primary Industries and Water 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.

Overview

The environmental values of the North West Bay River catchment, in south-eastern Tasmania, were derived from an interrogation of the Conservation of Freshwater Ecosystem Values (CFEV) database (CFEV, 2005) and a summary of these values is presented in this report. The CFEV database provides an objective means to identify freshwater ecosystem values in a catchment and therefore inform the environmental objectives of water resource management including the determination of environmental flows to maintain ecological assets. It is usually recommended that ecological values identified using the CFEV database are validated via field studies to verify the presence and condition of the identified ecological values. To a large extent, this has been undertaken by Telfer (2001), Green (1999) and via the river health and fish surveys detailed in an accompanying DPIW report (WA 08/XX). This report uses a number of terms that are specific to the CFEV Project. Definitions of these terms are provided in Appendix 1 and a flowchart in Appendix 2 outlines the steps undertaken in the CFEV assessment.

CFEV assessment

The CFEV framework (Appendix 2) assessed freshwater ecosystems within Tasmania based on naturalness, representativeness, and distinctiveness using the best available data (DPIW, in prep.). To guarantee other unique and important values were captured, an assessment of special values was also included. The results of the audit and conservation evaluation were used to identify conservation values and rank the conservation management priorities of freshwater-dependent ecosystems. Conservation management priorities may be immediate, indicating areas where urgent management actions are required to ensure the protection of significant conservation values, or potential, indicating areas that need to be considered where future developments or changes to land or water management are proposed. Only Conservation Management Priority Potential (CMPP) was used in this CFEV assessment of the North West Bay River catchment.

The CFEV framework determined a primary biophysical class for each ecosystem spatial unit (e.g. river section, wetland, waterbody, etc.) (DPIW, in prep.). The primary biophysical class highlights the ecological class or group that is used when considering the value of an ecosystem spatial unit during the conservation evaluation. This is the class for which a spatial unit is considered representative, and can be from a range of different ecosystem descriptors such as tree assemblages, fish assemblages, macroinvertebrates and geomorphology. To summarise the environmental values of the North West Bay River catchment, the primary biophysical classes and special values of freshwater-dependent ecosystems of High or Very High CMPP were extracted from the CFEV database. Other systems that have Medium or Low CMPP in the North West Bay River catchment may also be of conservation value (they may not be the best example of their biophysical class or may already be protected by appropriate land tenure (e.g. formal reserve)); however, they were not included in this assessment.

North West Bay River catchment

The North West Bay River catchment is located on the south- eastern coast of Tasmania (D'Entrecasteaux Channel) and drains an area of approximately 96 km² (Figure 1). North West Bay River originates on the upper slopes of Mt. Wellington, approximately 1.5 km west of the summit and flows into the estuary of North West Bay near the township of Margate. Three tributaries, Leverts Creek, Quarry Creek and Cooke Rivulet, enter the mainstream in the vicinity of Longley and together contribute approximately 46% of the flow of North West Bay River at Longley. Allens Rivulet, which enters in the lower reaches below Lower Longley, is the other major tributary of North West Bay River and drains most of the south-western area of the catchment. Land use in the catchment is predominantly a conservation zone in the higher reaches, urban in the mid reaches, and, a combination of dairy farming, viticulture, and hobby farms on the lower reaches. Urban activities are prominent, particularly on the southern bank of the North West Bay River from Longley to Margate.

Currently, there are approximately 69 water allocations in the North West Bay River and range in size from 0.4 to 8800 ML year⁻¹ for a total of 26800 ML year⁻¹. Of these 69 allocations, 3 allocations (8800, 6200 and 250 ML year⁻¹) granted to Hobart Regional Water Authority represent 98.5% of the allocation in the catchment (WIMS, 2007). These entitlements occur in the upper reaches of the catchment with water diverted from the main-stem and tributaries along the pipeline track. The remaining entitlements occur in the middle to lower regions of the catchment, with the largest allocations in Allens Rivulet (Figure 1). All of these allocations are for irrigation purposes with the exception of one industrial take. Three of these entitlements are storage allocation with the remainder being direct pumping.

Environmental values

Freshwater-dependent ecosystems in the North West Bay River catchment include rivers, wetlands, saltmarshes and an estuary (North West Bay). These ecosystems are classified as having Medium to Very High CMPP (Figure 1). Summaries of the environmental values of each ecosystem type are present in Tables 1-4.

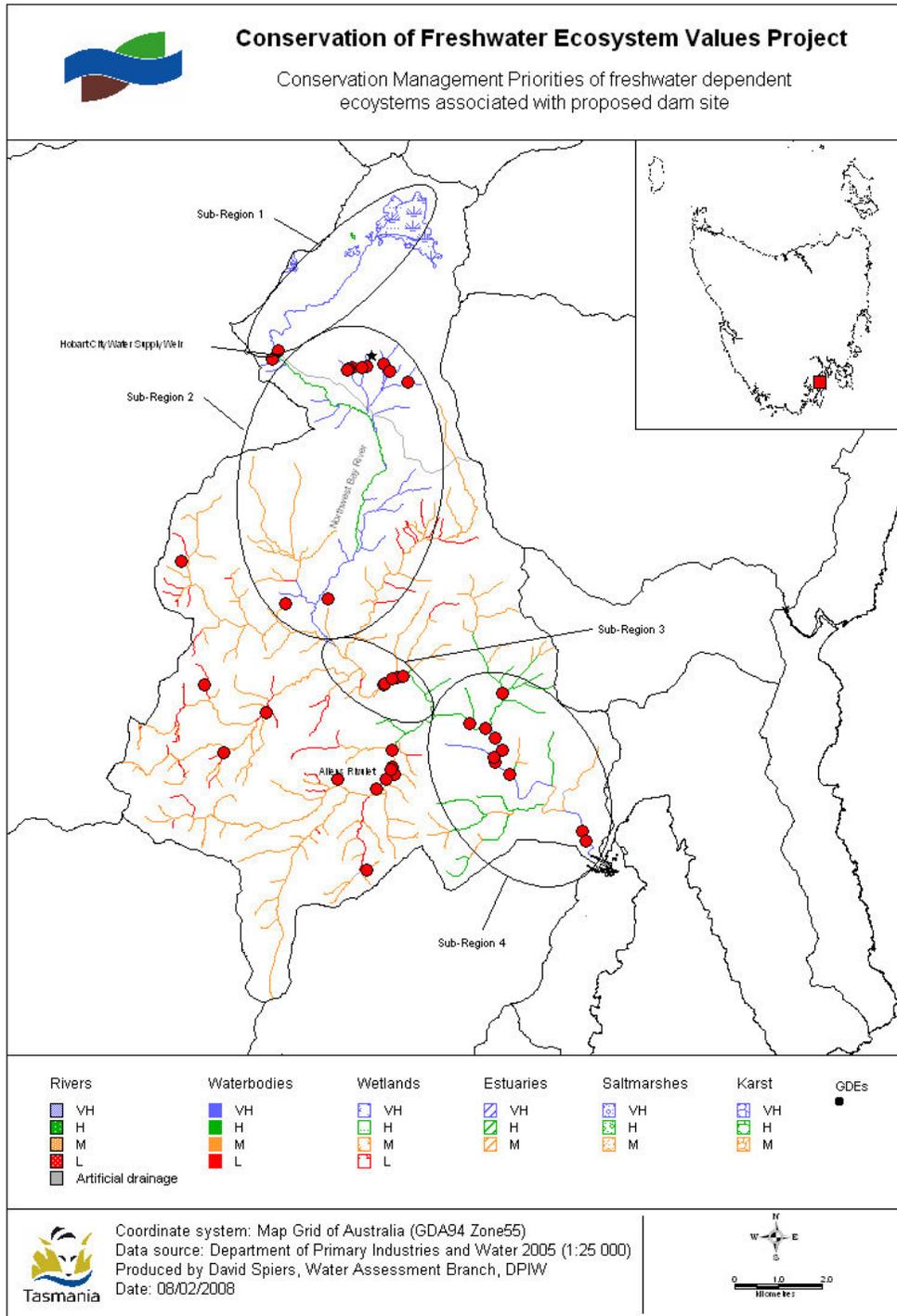


Figure 1. The CMPP ratings of the North West Bay River catchment according to the CFEV database, approximate locations of assessed river sub-regions and river sections and water allocations. CFEV, © State of Tasmania, the LIST, © State of Tasmania, and WIMS (2007).

Rivers

The values and CMPP ratings of riverine environments in the North West Bay River catchment are presented in Table 1. Most of the river sections in the North West Bay River catchment with High and Very High CMPP were grouped and assessed in sub-regions (Figure 1). Generally, the conservation value of river sections is driven by how representative they are of their biophysical class, their condition, and/or special values they may contain; therefore, information regarding these variables is also presented in Table 1.

The upper sub-region of the North West Bay River (sub-region 1) extends from the headwaters to Hobart Regional Water Authority weir and contains river sections of very high conservation value (Figure 1). These river sections are highly representative of their primary biophysical class, (either a fluvial geomorphic river type or a macroinvertebrate assemblage) and contains several outstanding special values, including one threatened fauna species (Mt. Wellington caddisfly) and one threatened flora species (Clasping-leaf heath). The condition of these river sections is High (1.0) indicating they are all in a near natural state (Table 1).

The mid-reaches of the North West Bay River (sub-region 2) extend from the water supply weir to the Huon Highway. Most of the river sections are of High CMPP with a small number of river sections of Very High CMPP (Figure 1). Most of this area is highly representative of its primary biophysical class (either a fluvial geomorphic river type or a tree assemblage), however its condition varies from Low to Medium (0.38 -0.82) indicating these river sections have probably been affected by human impacts (Table 1).

The lower-reaches of the North West Bay River is divided into two sub-regions, sub-region 3 extends from the Huon High to the confluence with Allens Rivulet and sub-region 4 from this point to the estuary. Sub-region 3 is either of Medium or High CMPP (Figure 1). Most of this area is low to moderately representative of its primary biophysical classes (a fluvial geomorphic river type) while its condition varies from Medium to High (Table 1). Sub-region 4 has CCMP ranging from Medium to Very High. These river sections are moderately to very highly representative of their primary biophysical class (a fluvial geomorphic river type) and in 4 of the river sections an outstanding special value (shrubby *Eucalyptus ovata* forest) has been identified. The Low to High (0.41 – 0.86) condition for the river sections in both sub-regions indicate that they have been somewhat impacted by human activity.

The platypus, which is a common special value in Tasmanian freshwater-dependent ecosystems, has been identified for all of the river sections in the North West Bay catchment.

Table 1: Summary of the values of riverine environments in the North West Bay River catchment. River sections in some river clusters are characterised by different biophysical classes; therefore, where this occurs, more than one biophysical class is shown. The locations of the river clusters are indicated in Figure 1. Descriptions of biophysical classes are presented in Appendix 3.

| River section | River section ID | CMPP | Representativeness | Biophysical classes | Special Values | Condition | Land tenure security |
|---|------------------|--------------------|--------------------|--|--|--------------|---|
| North West Bay River (sub-region 1) (upper reaches: headwater to weir)) | 234441 - 234,392 | High - Very High | High – Very High | <ul style="list-style-type: none"> Fluvial geomorphic river type (G29): High altitude dolerite in headwaters; Dissected eastern escarpment, South-east Derwent and Lower Huon Macroinvertebrate assemblage (BC8fm): Headwater first order alpine streams, depauperate form of assemblage C9m and located in same areas. Indicator taxa (EPTC groups); <i>Trinotoperia zwicki</i>, <i>Austrocercella christinae</i>, <i>Triplectides proximus</i>, Scirtidae, <i>Austrophlebioides</i> sp. AV7, <i>Eusthenia costalis</i>, <i>Tasmanoperla thalia</i> Blephacidae, <i>Trinotoperia inopinata</i>, <i>Nousia</i> sp. AV5/6, Simuliidae, <i>Apsilochorema obliquum</i>, <i>Aphlorrhithus</i> sp. AV2 dark | <ul style="list-style-type: none"> Phylogenetically distinct fauna: mountain shrimp (<i>Anaspides tasmaniae</i>) (OS) Threatened flora species: clasping leaf heath (<i>Epacris acumina</i>) (OS) Threatened fauna species: Mt. Wellington caddisfly (<i>Hydrobiosella armata</i>) (OS) Priority fauna species: <i>Metaphreatoicus</i> sp. Phylogenetically distinct fauna species: platypus (<i>Ornithorhynchus anatinus</i>). | Low - High | Low |
| North West Bay River (sub-region 2) (mid-reaches: weir to Huon Hwy) | 234390 - 230564 | Medium - Very High | Low - High | <ul style="list-style-type: none"> Fluvial geomorphic river type (G29): High altitude dolerite in headwaters; Dissected eastern escarpment, South-east Derwent and Lower Huon Tree Assemblage (T28): Dry sclerophyll and damp sclerophyll forests found on the Permian and Triassic sedimentary rocks of the lower midlands, and Derwent valley, extending to the East Coast west of Bichen and Long Point. Indicator taxa: <i>Acacia dealbata</i>, <i>Acacia mearnsii</i>, <i>Allocasuarina littoralis</i>, <i>Allocasuarina verticillata</i>, <i>Banksia marginata</i>, <i>Beyeria viscosa</i>, <i>Bursaria spinosa</i>, <i>Eucalyptus amygdalina</i>, <i>Eucalyptus globulus</i> subsp., <i>Eucalyptus ovata</i>, <i>Eucalyptus pulchella</i>, <i>Eucalyptus rodwayi</i>, <i>Eucalyptus rubida</i>, <i>Eucalyptus tenuiramis</i>, | <ul style="list-style-type: none"> Phylogenetically distinct fauna species: platypus (<i>Ornithorhynchus anatinus</i>) (NS) | Low - Medium | High Pipeline track to River-bend Rd Low below River-bend Rd |

| | | | | | | | | |
|--|------------------------|----------------------|---------------------|--|---|---|----------------------|------------|
| <p>North West Bay River (sub-region 3) (mid-reaches: Huon Hwy – Allens Rivulet confluence)</p> | <p>230565 - 231081</p> | <p>Medium - High</p> | <p>Low - Medium</p> | <p> <i>Eucalyptus viminalis</i>, <i>Exocarpos cupressiformis</i>, <i>Leptospermum scoparium</i> var., <i>Notelaea ligustrina</i>, <i>Olearia argophylla</i>, <i>Pomaderris apetala</i>, <i>Pomaderris elliptica</i>, <i>Pomaderris pilifera</i> </p> <ul style="list-style-type: none"> Tree Assemblage (T31): South eastern wet, damp and dry sclerophyll mosaic. A species rich assemblage, reflecting the rapid topographic change, and diverse geologies in south eastern Tasmania. Found around Hobart and south to Bruny Island and the Huon valley, Wielangta and in an arc from Little Swanport River, to the Swan river west of Bicheno. <p>Indicator taxa: <i>Acacia dealbata</i>, <i>Acacia mearnsii</i>, <i>Acacia melanoxylon</i>, <i>Allocasuarina littoralis</i>, <i>Allocasuarina verticillata</i>, <i>Banksia marginata</i>, <i>Beyeria viscosa</i>, <i>Bursaria spinosa</i>, <i>Callitris rhomboidea</i>, <i>Dodonaea viscosa</i>, <i>Eucalyptus amygdalina</i>, <i>Eucalyptus brookeriana</i>, <i>Eucalyptus globulus</i> subsp., <i>Eucalyptus obliqua</i>, <i>Eucalyptus ovata</i>, <i>Eucalyptus pulchella</i>, <i>Eucalyptus regnans</i>, <i>Eucalyptus rubida</i>, <i>Eucalyptus tenuiramis</i>, <i>Eucalyptus viminalis</i>, <i>Exocarpos cupressiformis</i>, <i>Leptospermum glaucescens</i>, <i>Leptospermum lanigerum</i>, <i>Leptospermum scoparium</i> var., <i>Notelaea ligustrina</i>, <i>Olearia argophylla</i>, <i>Pomaderris apetala</i>, <i>Pomaderris elliptica</i>, <i>Pomaderris pilifera</i>, <i>Zieria arborescens</i></p> | <p> <ul style="list-style-type: none"> Fluvial geomorphic river type (G29): High altitude dolerite in headwaters; Dissected eastern escarpment, South-east Derwent and Lower Huon </p> | <p>Phylogenetically distinct fauna species: platypus (<i>Ornithorhynchus anatinus</i>).</p> | <p>Medium - High</p> | <p>Low</p> |
|--|------------------------|----------------------|---------------------|--|---|---|----------------------|------------|

| | | | | | | | |
|--|-----------------|--------------------|--------------------|--|--|---------------|-----|
| North West Bay River (sub-region 4) (lower-reaches: Allens Rivulet confluence - estuary) | 231089 – 231166 | Medium - Very High | Medium – Very High | <ul style="list-style-type: none"> Fluvial geomorphic river type (G29): High altitude dolerite in headwaters; Dissected eastern escarpment, South-east Derwent and Lower Huon | <ul style="list-style-type: none"> Threatened flora community: Scrubby <i>Eucalyptus ovata</i> forest (OS) Phylogenetically distinct fauna species: platypus (<i>Ornithorhynchus anatinus</i>) (NS). | Medium - High | Low |
|--|-----------------|--------------------|--------------------|--|--|---------------|-----|

Wetlands

There are four wetlands in the North West Bay River catchment, ranging in size from 0.5 ha to 98.7 ha, although most are <3.5 ha in size (Figure 1; Table 2). Three of these wetlands are designated as having Very High CMPP, whilst the remaining one has High CMPP. All of these wetlands are located in the headwaters of the catchment and their hydrology is largely directed by sub-surface flows. Most of the wetlands are of Very High CMPP because they are good examples of their biophysical class; and all are in good condition (Table 2), as a result of their presence within the Mt. Wellington Park. In two wetlands an outstanding special feature, Dead Island Area Marsh and String Bogs, was identified. The platypus, which is a common special value in Tasmanian freshwater-dependent ecosystems, was identified as a special value of all four wetlands.

Table 2: Summary of the values of wetland systems in the North West Bay River catchment.

| | |
|----------------------------------|--|
| Area (ha) | 0.5 – 98.7 ha (0.9, 0.5, 3.5, 98.7 ha) |
| CMPP | High - Very High (H,VH, VH, VH,) |
| Relative Representiveness | Medium –Very High (M,H,H,VH) |
| Biophysical classes | <ul style="list-style-type: none"> • Tree Assemblage (T22): This assemblage consists of a group of heterogeneous sites that are characterised by the presence of only two species. The heterogeneity arises because some sites having no tree species recorded as present are classified into this group. Those in alpine areas or subalpine cliffs and scree slopes should be amalgamated with adjacent alpine vegetation and those in the lowlands with other appropriate tree assemblages. Indicator taxa: <i>Nothofagus cunninghamii</i>, <i>Tasmannia lanceolata</i> • Wetland located east of Tyler corridor, in non-responsive geomorphology, 1-10 ha area, at >800 m elevation • Wetland located east of Tyler corridor, in non-responsive geomorphology, 10-100 ha area, at >800 m elevation |
| Special Values | <ul style="list-style-type: none"> • Priority Geomorphic Features: Dead Island Marsh and String Bogs (OS) • Phylogenetically distinct fauna species: platypus (<i>Ornithorhynchus anatinus</i>) (NS) |
| Condition | High |
| Land Tenure Security | Low |

Saltmarshes

There are 8 saltmarshes in the North West Bay River catchment, ranging in size from 0.2 ha to 2.6 ha, although most are <1.2 ha in size (Figure 1; Table 3). Four of these wetlands are designated as having Very High CMPP, whilst of the remaining, 4 have High CMPP and one has Medium CMPP. All of these wetlands are located at the mouth of the catchment and their hydrology is influenced by a combination of tidal and fluvial processes. Most of the wetlands are of Very High or High CMPP because they are good examples of their biophysical class; and most are in good condition (Table 3), although three saltmarshes have low to medium condition of probably because they have been altered by recreational access and weed invasion. Other than the platypus, which is a common special value in Tasmanian freshwater-dependent ecosystems, no outstanding special values were identified for these saltmarshes.

Table 3: Summary of the values of saltmarsh systems in the North West Bay River catchment.

| | |
|------------------------------------|---|
| Area (ha) | 0.2 – 8.1 ha (mostly <1.2 ha) |
| CMPP | Medium - Very High (mostly > High) |
| Relative Representativeness | Medium – High |
| Biophysical classes | <ul style="list-style-type: none"> • Saltmarsh Biophysical Type: Small (< 1 ha) saltmarsh, located on mainland Tasmania, consisting of succulent saltmarsh vegetation (saline herbland). The coast associated within this saltmarsh is subject to small - intermediate tides and low wave energy. • Saltmarsh Biophysical Type: Moderate (1-100 ha) saltmarsh, located on mainland Tasmania, consisting of succulent saltmarsh vegetation (saline herbland). The coast associated within this saltmarsh is subject to small - intermediate tides and low wave energy |
| Condition | Low – High (5 high, 1 medium, 2 low) |
| Land Tenure Security | Low - Medium |

Estuary

The North West Bay River estuary is 31.7 ha in size and fed by both the North West Bay River and Margate Rivulet, and on the North West Bay River it extends from the Channel Highway to North West Bay (Figure 1; Table 4). Its hydrology is influenced by a combination of tidal and fluvial processes. This estuary is designated as having Medium CMPP, as it is a moderate example of its biophysical class; and is in poor condition (Table 4). This is probably due to a combination of siltation, alteration by human activity and weed invasion. Other than the platypus, which is a common special value in Tasmanian freshwater-dependent ecosystems, the Australian Grayling, *Prototroctes mareana*, was identified as a special value for this estuary.

Table 4: Summary of the values of North West Bay Estuary.

| | |
|------------------------------------|--|
| Area (ha) | 31.7 ha |
| CMPP | Medium |
| Relative Representativeness | Medium |
| Biophysical classes | <ul style="list-style-type: none">• Estuary biophysical type: Marine inlets and bays located along the east coast |
| Special Values | <ul style="list-style-type: none">• Threatened fauna species: Australian Grayling (<i>Prototroctes mareana</i>) (U)• Phylogenetically distinct fauna species: platypus (<i>Ornithorhynchus anatinus</i>) (NS) |
| Condition | Low |
| Land Tenure Security | Low |

Conclusions and recommendations

An interrogation of the CFEV database indicates there is a range of significant conservation values in the North West Bay River catchment. Most of the areas of very high conservation value occur in the upper reaches of the catchment, above the Hobart Regional Water Authority weir. This region, which contains several outstanding special values, appears to be largely in its natural condition, due to its presence in Mt. Wellington Park.

Below the weir a fluvial geomorphic river type has been identified as the primary conservation value for most river sections. The conservation value of this feature is unlikely to be impacted by flow diversion in the upper catchment as the flow drivers for fluvial process are predominantly in the high/flood flow regime and are essentially natural given the low amount of storage in the catchment. This means that the flow regime is unregulated and retains all higher flow components. Deleterious effects on this feature which have occurred are a result of modern land use practices, which include clearing of native riparian vegetation, weed invasion, bank modification and gravel extraction. The effect of these practices has been a loss of bank stability in the middle to lower reaches, and may have caused a straightening and deepening of the channel in the lower reaches (Telfer, 2001).

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Disclaimer

This information is a summary of results for the North West Bay River catchment from the Conservation of Freshwater Ecosystems Values (CFEV) database and is provided as advice only. It currently has no statutory status.

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Appendix 1. Terminology of the Conservation of Freshwater Ecosystem Values (CFEV) project (DPIW, in prep.).

CFEV project: The ‘Conservation of Freshwater Ecosystem Values’ project which has developed a planning and information tool (a database) to support the inclusion of freshwater values within a strategic framework for the management of Tasmania’s freshwater resources.

Biophysical class: Under the CFEV Project, biological and physical variables relating to freshwater dependent ecosystem were used to develop a ‘biophysical classification’ that is applicable at a State-wide level. For riverine ecosystems, the main biophysical classifications are for fish assemblages, geomorphic river types, aquatic plant assemblages, tree assemblages and crayfish assemblages.

Condition: The degree of change from the ‘natural’ or pre-European state (also see Naturalness)

Conservation Management Priority Potential (CMPP): A summary estimate of the priority for conservation management integrating assessed conservation value, condition rating and Land Tenure Security rating. This priority highlights those freshwater ecosystems that need to be considered in the situation where future development or changes to land or water management are proposed within the catchment. An ecosystem can be categorised as Very High, High, Moderate or Lower CMPP.

Land Tenure Security: An assessment of the degree to which the different land tenures may be considered to provide secure protection for freshwater ecosystem values. An ecosystem can have High, Medium or Low Land Tenure Security.

Naturalness: A measure of the departure from pre-European natural reference condition. This was derived for each ecosystem unit within the audit process as a single score based on a variety of sources of biophysical information.

Representativeness: The conservation value of an ecosystem spatial unit expressed as the relative importance of that example of the particular representative component with a priority on spatial units of high naturalness. An ecosystem can be rated to be of High, Moderate or Low representativeness, where High is the first group of sites selected (highly representative), Moderate is the second (moderately representative) and Low is the remainder of sites selected (least representative).

River section: The section of river in the drainage network between confluences.

Special Values: Unique of ‘distinctive’ conservation values other than those captured by the representativeness assessment process. These include values such as threatened flora and fauna species, threatened flora and fauna communities, priority geomorphic and limnological features and important bird sites.

Appendix 2. Framework of the Conservation of Freshwater Ecosystem Values (CFEV) project showing the steps for assessing freshwater dependent ecosystems in the statewide audit and conservation evaluation (DPIW, in prep.).

