



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

**ENVIRONMENTAL  
MANAGEMENT  
GOALS  
*for* TASMANIAN  
SURFACE WATERS**

**DORSET & BREAK O'DAY  
MUNICIPAL AREAS**

**FINAL PAPER  
November 2005**



## Environmental Management Goals for Tasmanian Surface Waters:

### DORSET & BREAK O'DAY MUNICIPAL AREAS

Between 1999 and 2005 Protected Environmental Values (PEVS) were set for the Dorset and Break O'Day Municipal Areas. A discussion paper was prepared to facilitate public participation in setting the PEVs. This discussion paper was intended as a basis for community and stakeholder participation in the process of developing environmental management goals for the waterways that are located within the Dorset and Break O'Day Municipal Areas.

The discussion paper was prepared by the Department of Primary Industries, Water and Environment in consultation with the Tasmanian Parks and Wildlife Service and the Dorset and Break O'Day Councils.

The paper has been modified into its current form to reflect completion of the process for the Dorset and Break O'Day Municipal Areas. It is considered, however, that much of the information included in the original paper should remain as a record of the PEV setting process.

Words and expressions used in this final paper have, unless the contrary intention appears, the same meaning as defined in the *State Policy on Water Quality Management 1997* and the *Environmental Management and Pollution Control Act 1994*.

Ecosystem refers to physical, chemical and biological aspects of the aquatic environment.

This final paper is divided into six main sections:

- The first part describes water reforms in general.
- The second part provides a brief description of the Dorset and Break O'Day Municipal Areas.
- Part three discusses the *State Policy on Water Quality Management 1997*.
- The final Protected Environmental Values for the Dorset and Break O'Day Municipal Areas are shown in part four.
- Water quantity values are discussed in part five, and
- Part six lists the community water values for the catchments.

\* This paper does **not** include those areas of the South Esk Catchment within these municipalities. For further information on the South Esk refer to the paper: "Environmental Management Goals for Tasmanian Surface Waters: Macquarie and South Esk River Catchments"

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# 1 INTRODUCTION

## 1.1 Why do we need water reform?

A good supply of fresh, clean water is an essential requirement for human life, a healthy environment and a productive economy.

We need it for drinking, for recreational activities like fishing, swimming and boating, to provide the food we eat and export, to generate clean electricity, and to support mining and other industries.

We also expect our rivers and lakes to look healthy, and provide a healthy environment for a wide range of aquatic plants and animals.

We take for granted that our use of water resources is sustainable; that our hard-working water will still be there in a healthy state to provide the same benefits for future generations.

Tasmanian rivers range from relatively short, swiftly flowing rivers fed from mountain sources to slowly flowing rivers which may be reduced to a series of pools during dry periods. Our waterways are not immune from problems, however, and many of our river systems are showing signs of stress.

River health, and the health of the economies that depend upon them, is clearly linked to the way we use the waters; the degree of regulation we impose; the quantity of water we take out; and the quality of water we return.

In response to a general recognition across the community of the importance of having clean water and appropriate river flows, the Tasmanian Government has instigated a range of reforms designed to ensure that these values are protected for the future of the State.

## 1.2 What are these reforms?

Two major aspects of the water reforms are water quality management and water quantity management.

### (a) water quality management

The *State Policy on Water Quality Management 1997* is designed to **maintain or enhance** the quality of Tasmanian surface waters. Principal objectives of the Policy include:

- Move on from reliance on ‘end of pipe’ controls to take into consideration the number of discharges into a given water body, or the sensitivity or current condition of the water body.
- Ensure that diffuse source and point source pollution does not endanger the achievement of water quality objectives and that pollutants discharged to waterways are reduced as much as possible using environmental best practice.
- Facilitate and promote integrated catchment management.
- Focusing on overall water quality management strategies by identifying those water quality values and uses that are considered worthy of protection.

The first purpose of this paper is to explain how water quality values were identified. Local communities played a key role in identifying values for their areas.

### (b) water quantity management

Replacement of the *Water Act 1957* by the *Water Management Act 1999* provided for:

- major changes to the institutional arrangements for water management;
- the ready transfer of water rights between different users;
- enhanced stakeholder and community input into water allocation and management; and
- a more transparent and equitable water allocation system, including formal allocation of flows to maintain a healthy river environment.

The second purpose of this paper is to summarise stakeholder and public views on what is valued in water resources from a water quantity perspective.

### **1.3 What did we want the public to do?**

Local communities have a valuable understanding of their regional waterways. Catchment stakeholders were asked the following questions:

- Which of your activities rely upon maintaining or enhancing the flow of water into catchment waterways?
- Are there certain places on your rivers that you traditionally use for swimming or other recreational activities?
- Do you fish in them?
- Are there specific features of your rivers and streams that are recognized scenic attractions, such as rapids or waterfalls?
- Do you know of rare or endangered animals or plants in, or adjacent to, specific areas of your rivers or streams?
- Do you use water for livestock watering?
- Does your river supply the local town water supply?

- Do you draw water from it to irrigate your farm?
- How often do you need to draw water from it, and when?

Answers to these questions from catchment stakeholders and the public helped to develop the community water values for regional wetlands and waterways (Tables 6-10). People had different views on these questions. What was needed to do was to try to think about the "big" picture, and how our own objectives may impact on the whole catchment and the wider community.

Planning to ensure sustainable use of these waters and protection of river health requires sound knowledge of local water quality and quantity issues. As such, the public submissions providing local knowledge were critical to the process.

### **1.4 How was the input used?**

Information from the public on values particularly relating to water quality assisted with finalisation of the range of Protected Environmental Values for the surface waters of the regional waterways. These values are to be used in management planning for the region.

Information from community stakeholders, catchment groups and the public on community water values will be used to better plan the water resources of the catchments. Water management planning will be closely linked with overall catchment management planning to put water resource management on a sustainable footing for the State. Water management planning will be undertaken on a priority basis, with stressed rivers in the State being targeted initially.

## 2 NORTH-EASTERN CATCHMENTS: OVERVIEW

The Dorset Municipality is predominantly rural with a total population of 7,500. Major centres are Bridport, Scottsdale, Ringarooma, Branxholm, Derby and Gladstone. Scottsdale is located in rich agricultural country and is also the centre of a substantial pine forest industry. While mining was historically important in the area, many of the old townships have disappeared with the closure of mines. Of the remaining centres, Gladstone, Herrick and Pioneer have a history of tin and gold mining, Branxholm was an important tin mining centre, and Derby had the largest open cut tin mine in the Southern Hemisphere. As a consequence of the mine's closure, Derby's population fell from over 3,000 down to 250 and its main source of revenue is tourism. Bridport is another popular holiday destination and fishing port.

The Break O'Day Municipality is situated on the northern part of Tasmania's East Coast and has an extensive rural base with a population of 5,800. Major centres are Binalong Bay, St Helens, Falmouth and Scamander. Fishing is the main industry in St Helens with tourism coming a close second (the population can increase from 2,600 to around 10,000 during the summer months). Historically St Helens was used as a port for tin and timber industries in the area as well as having a tin smelter and smaller mining operations. Binalong Bay is now a popular coastal recreation area. Scamander is a coastal holiday area with clean white beaches and lagoons. The Scamander River is famous for its trout and bream fishing. Pyengana's early history of tin mining is linked with the townships of Lottah

and Goulds Country. It is now an agricultural and dairying area.

The major river catchments located within the north-eastern municipalities of Dorset and Break O'Day are outlined below. In addition, there are many smaller waterways running directly into coastal waters with catchments of less substantial size.

**Table 1: Major Catchments**

Catchment	Area (km <sup>2</sup> ) <sup>(a)</sup>
Ansons	237
Apsley <sup>(b)</sup>	231
Boobyalla	249
Brid	149
Douglas	70
Georges	522
Great Forester	517
Great Musselroe <sup>(c)</sup>	309
Hurst	94
Little Forester	342
Ringarooma	921
Scamander	301
Tomahawk	139

Notes:

- a) estimated from Australian Coastal Atlas
- b) flows into the Glamorgan - Spring Bay municipality
- c) marks roughly the transition from Dorset to Break O'Day municipalities

## 2.1 Climate and Geology

The climate is best described as temperate to cool temperate maritime with a transition to cooler, wetter weather moving from the coastal areas to the higher inland areas. Average annual minimum and maximum temperatures on the coast are 9°C and 15°C respectively, compared to lower temperatures further inland in the order of 0-3°C and 9°C respectively. Rainfall on the coast (~600 mm) is up to half of that experienced at higher altitudes (~1200 mm). Comparison of a coastal centre such as St Helens (5 metres elevation) with an inland town such as Scottsdale (190 metres elevation) reflects these different conditions, particularly in terms of rainfall (mean annual rainfall for St Helens is 780 mm, and for Scottsdale is 1057 mm). June to August is typically the highest rainfall months across the region, with minimum average falls experienced from January to March<sup>1</sup>.

The basic geology of the areas consists of extensive late Carboniferous to Devonian granitic intrusions into folded marine sediments (sandstone, greywacke, shale) partly overlain by Cainozoic basalt, alluvium and coastal plain deposits. In the south of the region there are also erosional remnants of flat lying Permian to Triassic sedimentary rocks of the Parmeener Supergroup, intruded in places by Jurassic dolerite.

<sup>1</sup> Data from Bureau of Meteorology website: [www.bom.gov.au/climate](http://www.bom.gov.au/climate)

**Table 2: Major Geological Classes Of Catchment<sup>2</sup>**

Catchment	Area of major geological class (km <sup>2</sup> )				
	Basalt	Carbonaceous	Dolerite	Granite	Sedimentary
Ansons Bay	-	-	-	143	115
Big Lagoon	-	-	-	15	2
Boobyalla Inlet	105	-	8	516	558
Brid / Great Forester	37	-	-	237	502
Douglas	-	16	51	-	6
Georges Bay	17	-	-	370	169
Grants Lagoon	-	-	-	6	1
Great Musselroe	1	-	4	172	254
Hendersons Lagoon	-	-	-	26	24
Little Forester	2	2	1	5	339
Little Musselroe	-	-	19	1	59
Scamander	1	-	-	49	289
Sloop Lagoon	-	-	-	9	1
Templestowe	-	3	11	-	11
Tomahawk	-	-	-	54	90

## 2.2 Catchment Water Uses

Water is used for numerous applications within the north-east region. Many centres across the region rely upon extraction of water from local waterways for town water supply. These towns (indicated on the regional map) are Bridport, Scottsdale, Branxholm, Ringarooma, Legerwood,

<sup>2</sup> drawn from: G.J. Edgar, N.S. Barrett and D.J. Graddon. 1999. *A Classification of Tasmanian Estuaries and Assessment of their Conservation Significance using Ecological and Physical Attributes, Population and Land Use*. Tasmanian Aquaculture and Fisheries Institute

Derby, Herrick, Pioneer, Gladstone, St Helens, Scamander and Nabowla.

The Winneleah Irrigation Scheme is one of three schemes around the State operated and administered by the Rivers and Water Supply Commission. The Scheme covers about sixty properties. The 1998/99 irrigation season was characterised by somewhat reduced water use due to a wetter summer. This season recorded 1,226 hectares irrigated with 3,845 ML, with over two thirds of this volume applied to pasture<sup>3</sup>. Potatoes, stock and domestic use were the other major users.

The sewage treatment plant at Scottsdale emits an annual load to the waterways of ~5,500 kg of nitrogen and ~8,600 kg of phosphorus<sup>4</sup>. Bridport sewage treatment plant discharges into Andersons Bay. St Helens discharges into Georges Bay. Stieglitz effluent is used for irrigation. Scamander sewage treatment plant is irrigating the golf course. Many small towns particularly in Dorset are not sewered and are on septic systems.

Some tourism operations for the area are based on the use of water. An event that annually boosts the visitor numbers to the Ringarooma catchment is the Derby River Derby. Trout fishing and waterskiing are also favoured water related pursuits in the region.

### 2.3 Catchment Uses

The area has a history of many uses over time, with some still existing today. Historically Aboriginal people used the coast extensively, as shown by

widespread evidence of middens and the presence of tools and stone assemblages.

There is an extensive history of mining in the region. Gold and silver mining was generally more common in the more westerly areas, whereas tin and tungsten mining was concentrated in the eastern areas. Some mining of coal has been undertaken along the eastern coast south of St Marys. Granite is the main source of tin, tungsten and copper found in past mines that stretched in a belt from Scamander through to Gladstone in the far north east. Gemstones such as topaz, zircon and sapphires are also associated with the north east granites<sup>5</sup>.

Historical mining operations have a record of degrading local water quality. Often these impacts persist following closure of mines. Rehabilitation of the North East Tinfields site near Gladstone is a regional example of works undertaken to remediate the impacts of past mining activities on water quality. Works undertaken during 1998/9 concentrated on erosion control at the former Endurance and Monarch mines and diversion of clean water from the acid water in Ruby Lagoon<sup>6</sup>. Ruby Creek is an area that is highly impacted by past mining practices. An honours thesis on the generation and transport of acid water in local tailings will provide information for future rehabilitation options on mine tailings. A further study on the toxicity of the tailings may also help to explain the reasons for the stunted growth or complete failure of past revegetation attempts. Although there is very little mining occurring in

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<sup>3</sup> R&WSC 1998-99 Annual Report

<sup>4</sup> National Pollutant Inventory website: [www.npi.gov.au](http://www.npi.gov.au)

<sup>5</sup> Tasmanian Minerals Council website: [www.tasminerals.com.au](http://www.tasminerals.com.au)

<sup>6</sup> Mineral Resources Tasmania. Annual Review. 1998/1999

the region there are a lot of current exploration leases for gold and tin. Also as a remnant of the past some locals partake in recreational mining activities.

Alluvial mining injected large sediment slugs into many rivers, resulting in significant adjustments to geomorphological and ecological processes. In several river channels (notably the Ringarooma) much of this sediment remains in transit downstream.

A pyrethrum plant exists on the Great Forester River at Tonganah. This plant no longer discharges to the River and any effluent from the plant is held in holding dams. Along with these aforementioned industries there are many smaller industries within the area.

An aquaculture industry (shell-fish farming) operates in Georges Bay at St Helens. Under a "Marine Farming Development Plan for Georges Bay" drafted in October 1998 the potential area for marine farming will increase from 40 ha to over 100 ha. Fish farm hatcheries also exist in the area particularly on the Brid River.

Freshwater fishing is available in many lakes and rivers. Blackmans Lagoon, Little and Big Waterhouse Lakes, the Little Forester, Brid and Ringarooma Rivers are favourite fishing spots.

There are also small wood processing plants within the region due to extensive areas of softwood and hardwood plantations that are found on both private and public land, particularly in the Dorset area.

**Table 3: Population, Catchment Cover and Land Use Characteristics<sup>7</sup>**

Estuary	Estimated Population (persons)	Estimated Population Density (persons/km <sup>2</sup> )	Estuarine Catchment Area (km <sup>2</sup> ) (as inferred from satellite imagery)						Land Tenure/Use (km <sup>2</sup> ) Within Each Estuarine Catchment Area <sup>8</sup>			
			Woody Vegetation	Herbaceous Vegetation	Bare Ground	Water	Cleared Land	Urban Land	National Park	Reserved Crown Land	Exploited Crown Land	Private Land
Ansons Bay	149	0.58	196.7	22.2	21.9	0.4	16.8	0.9	0.8	20.8	169.8	67
Big Lagoon	2	0.14	13.7	2.7	0.6	0.0	0.2	0.1	-	7.3	9.6	0.2
Boobyalla Inlet	1934	1.63	789.6	83.2	16.6	6.3	289.5	2.0	-	45.1	733.5	407.8
Brid/Great Forester	3674	11.45	473.5	45.3	12.0	0.8	242.4	2.5	-	24.8	355.4	396.1
Douglas	19	0.26	66.1	3.8	0.6	0.1	2.9	0.1	66.9	-	0.9	5.7
Georges Bay	1768	3.18	419.2	41.7	12.6	1.6	79.6	2.0	-	44.7	337.7	173.0
Grants Lagoon	49	7.25	5.1	1.0	0.4	0.1	0.1	0.1	-	1.6	2.7	2.3
Great Musselroe	143	0.33	261.0	29.5	10.9	0.8	128.0	1.4	24.7	8.8	166.7	230.8
Hendersons Lagoon	67	1.33	33.4	2.8	0.9	0.4	12.9	0.1	-	4.1	14.5	31.1
Little Forester	820	2.36	227.5	18.6	5.5	0.5	94.1	1.0	-	0.6	152	194
Little Musselroe	25	0.31	16.8	4.5	2.1	0.2	55.9	0.1	-	0.8	-	78.5
Scamander	611	1.79	286.4	28.2	11.9	0.7	12.9	0.8	-	20.1	300.5	19.1
Sloop Lagoon	4	0.40	8.0	2.3	0.3	0.0	0.1	0.1	-	1.6	9.1	-
Templestowe	32	1.25	16.3	2.2	0.4	0.6	5.7	0.1	15	-	0.8	9.5
Tomahawk	25	0.17	80.6	8.1	3.4	0.2	51.9	0.3	-	2.7	71.3	70.3

<sup>7</sup> drawn from: G.J. Edgar, N.S. Barrett and D.J. Graddon. (1999) *A Classification of Tasmanian Estuaries and Assessment of their Conservation Significance using Ecological and Physical Attributes, Population and Land Use*, Tasmanian Aquaculture and Fisheries Institute

<sup>8</sup> land tenure may have changed since this table was prepared. In particular, the amount of Reserved Crown Land in some catchments will have increased as a result of the Regional Forest Agreement process.

## 2.4 Areas of Conservation Significance

A number of areas (primarily coastal) are managed under the *National Parks and Reserves Management Act 2002*. There are two National Parks located within the Dorset and Break O'Day municipalities. These are large natural areas of land which contain outstanding features or scenery. Mt William National Park (18,439 hectares) is in the far north-east corner of the State and is an important area for the conservation of Tasmania's coastal heathlands and dry sclerophyll plants. It is an important sanctuary for the Forester (or eastern grey) kangaroo, in addition to wombats, Bennetts wallabies and Tasmanian pademelons. The park provides habitat for a diversity of land, shore and sea birds. Douglas-Apsley National Park (16,800 hectares) on the east coast just north of Bicheno provides important habitat for animals and plants adapted to conditions found in dry sclerophyll forests.

State reserves are areas of land containing significant natural landscapes; natural features; and/or sites, objects or places of significance to Aboriginal people. In the north-east region this includes St Columba Falls State Reserve (295 ha) near Pyengana; St Marys Pass State Reserve (360 ha) and St Patricks Head State Reserve (1,335 ha) overlooking the east coast to the east of St Marys; and Little Beach State Reserve (945 ha) on the coast, also to the east of St Marys.

Conservation areas are areas of land, predominantly in a natural state, where mining, and in some cases, hunting, may be permitted. These are located in coastal areas with one exception (Little Boobyalla River). Moving from west to east these include Double Sandy Point

(640 ha); Granite Point (52 ha); Waterhouse (6,953 ha); Little Boobyalla River (480 ha); Cape Portland (209 ha); Musselroe Bay (1750 ha); Parnella (15 ha); Humbug Point (0.1 ha); Ansons Bay (40 ha); Bay of Fires (1,210 ha); Medeas Cove (81 ha); St Helens Point (1,066 ha); Scamander (405 ha); Little Beach (47.5 ha); and Seymour (68 ha).

Humbug Point (1,620 ha) on the northern side of Georges Bay is the only designated nature recreation area (land predominantly in a natural state; or containing sensitive natural sites of significance for recreation).

The area contains a number of Forest Reserves. Forest Reserves are established primarily to protect flora and fauna values, however many of them also protect cultural heritage and other values.

Mount Cameron Water Race is protected due to its National Estate listing. From 1881 to 1984 the race provided permanent water to Tin Mines in Gladstone. During its time an extensive network of branches were established to allow new tin mines on either side of the Ringarooma River to develop. The original 20 km race was constructed in 1881-1882 by Mount Cameron Hydraulic Tin Mining Company<sup>9</sup>. In 1887 this was extended a further 33km. Due to the gradual decline in mining all branches of the race were closed leaving only the 53 km long main race which still remains today.

Private sanctuary status applies to an area of freehold land where the owner

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<sup>9</sup> Dickens, G.J. 1992. *The Mount Cameron Water Race Board – A history of management*. Mineral Resources Tasmania.

has agreed to the protection of significant natural and/or cultural values. Examples in the north-east are at Cape Portland (823 ha) which is waterfowl habitat and North-East Park at Scottsdale (16 ha) which is important for its wet sclerophyll vegetation.

A number of countries came together at Ramsar (Iran) in 1971 to establish the 'Convention on Wetlands of International Importance', known colloquially as the 'Ramsar Convention'. Wetlands listed under the convention are deemed to have international significance as habitat for waterbird populations, as representative wetlands or because they are especially significant for their ecology, botany, zoology, limnology or hydrology. There are three Ramsar sites in the north-east region - Little Waterhouse Lake (56 ha); Jocks Lagoon (19 ha); and the Lower Ringarooma River Flood Plain (3,407 ha)<sup>10</sup>.

Tasmania has 91 wetlands listed within the *Directory of Important Wetlands in Australia*<sup>11</sup>, however few of these are afforded protection under the *National Parks and Reserves Management Act 2002*. Other areas administered under the *Crown Land Act 1976* are also afforded little protection, as traditional land practices in adjacent areas continue. These wetlands may be important for a variety of reasons relating to flora and fauna, or hydrological and cultural values. There are several important wetlands in the north-east, over and above the designated Ramsar wetlands. These

include: Blackmans Lagoon south west of Waterhouse Point; a section of Surveyors Creek, around 8 km north-east of Scottsdale; Tregaron Lagoons 4 km south-east of Cape Portland; unnamed wetland 4 km west of Cape Naturaliste; unnamed wetlands on the peninsula of Cape Portland and 1.5 km and 2 km south-east of Cape Portland; unnamed wetland 500 m inland of Little Musselroe Bay; unnamed wetlands 2 km and 4.5 kms south of Waterhouse Point.

**Table 4: Rare Waterway Animals<sup>12</sup>**

Kingdom	Class	Name		
Invertebrates	Crustacea	giant freshwater crayfish <i>Astacopsis gouldi</i>		
		Scottsdale burrowing crayfish <i>Engaeus spinicaudatus</i>		
	Gastropoda	freshwater snail <i>Beddomeia briansmithi</i> <i>Beddomeia fromensis</i> <i>Beddomeia minima</i> <i>Beddomeia tasmanica</i>		
		Insecta	caddisfly <i>Hydrobiosella sagitta</i> <i>Hydroptila scamandra</i>	
			Vertebrates	Freshwater Fish
				Amphibia
Vertebrates	Freshwater Fish	dwarf galaxias <i>Galaxiella pusilla</i> Australian grayling <i>Prototroctes maraena</i>		
	Amphibia	green and golden frog <i>Litoria raniformis</i>		

The range of the Tasmanian giant freshwater crayfish *Astacopsis gouldi* has apparently contracted, with probable extinctions in some lowland stretches of rivers and at the extremities of its historical distribution. Crayfish were not found in a recent survey where the riparian vegetation had been totally removed in established agricultural areas (Horwitz 1994)<sup>13</sup>.

<sup>10</sup> <http://www.deh.gov.au/water/wetlands/>

<sup>11</sup> *A Directory of Important Wetlands In Australia* - Tasmania Stewart A. Blackhall, A. Jasmyn Lynch & Christine Corbett. Parks and Wildlife Service (<http://www.deh.gov.au/water/wetlands/database/directory/tas.html>)

<sup>12</sup> GT SPOT database, Tasmanian Parks & Wildlife

<sup>13</sup> Horwitz, P. 1994, 'Distribution and conservation status of the Tasmanian giant freshwater lobster

## 2.5 North-East Estuary Classification

Regional estuaries tracking from west to east: Little Forester, Tomahawk, Little Musselroe, Great Mussleroe, Ansons Bay, Grants Lagoon, Henderson's Lagoon, Templestowe and Douglas.

A technical report published by the Tasmanian Aquaculture and Fisheries Institute on the conservation significance of the State's estuaries gives an indication of the relative health of estuaries in the north-east<sup>14</sup>. Results are summarised below.

The estuary in each group with the least human disturbance and greatest proportion of catchment area under statutory protection was considered to possess highest conservation significance. Estuaries could also be assigned a high level of conservation significance if they possessed exceptional species diversity or included species with restricted distributions. Using these criteria, estuaries were assigned to one of the following classes:

### Class A: *Critical conservation significance*

Estuary and associated catchment area show minimal effects of human activity and are identified as key components within an integrated system of representative reserves around Tasmania. Also includes sites with exceptional fish and invertebrate biodiversity. The technical report recommends that plants, animals and habitats within Class A estuaries and associated catchments should be fully protected as a matter of highest priority.

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Astacopsis gouldi (Decapoda: Parastacidae)', *Biological Conservation*, vol. 69, pp. 199–206.

<sup>14</sup> Edgar *et al.* (*op. cit.*)

No class A estuaries were identified within the north-east region.

### Class B: *High conservation significance*

Estuary and associated catchment area remain relatively undisturbed or contain an unusual range of species. The technical report recommends that Class B estuaries and associated catchments should be quarantined from future developments, and existing human impacts reduced wherever possible. Aquatic biota should be protected other than from anglers using hook and line or exploitation within existing marine farm lease boundaries. Boobyalla, Big Lagoon and Sloop Lagoon were estuaries deemed to be of high conservation significance.

### Class C: *Moderate conservation significance*

Estuary and associated catchment area are affected by human habitation and land clearance, but have not been badly degraded. The technical report recommends that Class C estuaries should be made available for a variety of recreational and commercial purposes. The Little Forester, Tomahawk, Little Musselroe, Great Mussleroe, Ansons Bay, Grants Lagoon, Henderson's Lagoon, Templestowe and Douglas estuaries were all recorded as estuaries of moderate conservation significance.

### Class D: *Low conservation significance - moderately degraded*

Estuary and associated catchment have been moderately degraded by human impacts. The Technical report recommends that Class D estuaries should be made available for a variety of recreational and commercial purposes. Remediation processes should be assisted where practical. The Brid, Georges Bay & Scamander

estuaries were deemed to be of low conservation significance.

The report also listed the major threatening processes for estuarine health around the State which are considered to need to be managed to ensure the sustainability of any estuarine system. These are:

- Exploitation of biological resources with unknown consequences for ecosystem structure and function.
- Increased sedimentation resulting from land clearance and urban and rural runoff.
- Increased nutrient loads resulting from sewage effluent and agricultural use of fertilisers
- Urban runoff
- Foreshore development and dredging
- Marine farms
- Modification to water flow through dams and weirs
- Acidification of rivers and heavy metal pollution from mines
- Spread of introduced pest species
- Long-term climate change.

## 2.6 Catchment water quality issues

Water quality within the north-eastern municipalities of Dorset and Break O'Day is generally good with both the water resources and waterways in good condition. It appears that most nutrients and faecal input into the systems are derived from the agricultural activities. Past mining activities have had their impact on modifying the catchments and on water quality.

In the majority of rivers within this region the waters are relatively acidic, even though the waters are classed as

clear with healthy dissolved oxygen levels. Many of the waters throughout the catchment have low dissolved salt concentrations.

Dissolved aluminium levels are high in some of the rivers throughout the region due to either past mining practices or the underlying granite geology. Some aluminium levels such as those recorded in the Wyniford River may pose a risk to the aquatic environment.<sup>15</sup> Some rivers show signs of extensive sedimentation and this may also be due to past mining practices. High iron levels have been recorded in some parts of the rivers, even to levels that can be tasted.

Sedimentation has been a significant problem in rivers that have had mining operations on them; particularly Ringarooma, Boobyalla and Great and Little Musselroe Rivers. Historically sedimentation problems were noted most obviously below Branxholm. The sediment levels in rivers varied dependant on the intensity of the mining operations. Sediment levels overtime tend to be transported down stream. Some of the rivers in this mining region have shown an increase in height of the riverbed due to sediment accumulation. Riverbed health appears to be highly impacted by accumulated sediment.<sup>16</sup>

Rivers in some catchments used extensively for agricultural purposes are suffering from increased nutrient loads due to runoff from agricultural land. Pesticides being delivered to the waterways can also be of concern in some parts of some catchments.

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<sup>15</sup> Bobbi, C., Nelson, M., Krasnicki, T., and Graham, Bryce. 1999. State of Rivers Report for Rivers in the Great Forester Catchment. Department of Primary Industries, Water and Environment.

<sup>16</sup> Steane, J.D. 1983. Ringarooma River Silting By Mines Tailings. Discussion Paper.

On the whole the catchments in this region vary in their environmental quality from areas of high conservation significance and good water quality to areas of lower conservation significance with reduced water quality.

### 2.3 Catchment environmental issues

As stream conditions are determined both by in-stream activities and surrounding land-use activities, waterways act as a touchstone of catchment health. Healthy waterways are indicative of sustainably managed catchments. There are a number of environmental issues relating to the health of waterways in the Dorset and Break O'Day municipalities:

- Erosion and soil loss in the upper catchment and deposition lower in the catchment.
- Loss of phosphorus from the catchment during flood events (probably in a form which is bound to eroded sediments).
- Effects of discharge from sewage treatment plants and other point source discharges on stream water quality.
- Effects of seepage from the extensive septic tank network in areas of the catchment.
- Minimising effects of dairying activities on stream water quality.
- Reducing faecal pollution of waterways.
- Protection of groundwater quality.
- Maintenance and enhancement of habitat quality and diversity for aquatic flora and fauna.
- Maintaining viable populations of endangered animal and plant species
- Maintaining and preserving instream aquatic habitat (large woody debris, native macrophyte beds, river bed substrates etc).
- Maintaining free fish passage for both upstream and downstream daily and seasonal movements and migrations.
- Impacts of land clearance and forestry operations on water yield.
- Investigation into the effects of leachate from old tip sites on water quality.
- Minimising stream bank erosion in catchment.
- Erosion through forestry activities (road construction, harvesting etc.) and associated loss of, or stress to, aquatic and riparian habitats.
- Environmental flow requirements.
- Willow infestations along many waterways clog existing channels; divert water to new channels with subsequent erosion; replace native riparian flora; and have impacts on water quality.
- Discharges from numerous small industries within the catchment.
- Effects of stock watering on stream bank erosion and faecal contamination of waterways.
- Minimising effects from past mining operations.
- Inputs of fertilisers from agricultural land runoff.
- Effluent problems from shack sites at Ansons Bay (102 shacks) and other smaller groupings of shack sites in the area.

### 3 WATER QUALITY: PROTECTED ENVIRONMENTAL VALUES

#### 3.1 Setting Protected Environmental Values

The first step in the implementation of the *State Policy on Water Quality Management 1997* is the identification of **Protected Environmental Values (PEVs)** of the surface waters in each region. **PEVs are the values or uses of the water body for which it is determined that any given area of that water body should be protected.** These values and uses should be clearly in evidence at the time of the implementation of the Policy.

The Policy specifies a range of PEVs which may be applied to a given water body. The PEVs are:

- A. Protection of Aquatic Ecosystems
- B. Recreational Water Quality and Aesthetics
- C. Raw Water for Drinking Water Supply
- D. Agricultural Water Use
- E. Industrial Water Supply

These values are described in more detail in the following section.

More than one PEV may be applied to a water body.

The Board of Environmental Management and Pollution Control will then specify a range of pollutant limits called Water Quality Objectives. These will be designed to ensure the quality of water in that water body is maintained at a level which will allow the chosen values to be protected.

The Policy then sets out a range of strategies which are aimed at ensuring

that waste water discharges from point sources (such as industrial or sewage treatment plant discharges) and diffuse sources (such as runoff from highways, urban areas, farms, forest harvesting etc.) will not endanger the achievement of the Water Quality Objectives.

The Board and local planning authorities will use these strategies in land use planning and approvals processes, and in ongoing regulation, to ensure that the PEVs for a given water body are maintained or enhanced over time.

#### 3.2 Protected Environmental Values Categories

The Policy lists a range of PEVs which are used to describe the identified values and uses of a given water body. These are:

##### **A: Protection of Aquatic Ecosystems**

- (i) Pristine or near pristine ecosystems;
- (ii) Modified (not pristine) ecosystems:
  - (a) from which edible fish, crustacea and shellfish are harvested, or
  - (b) from which edible fish, crustacea and shellfish are not harvested.

*What does pristine mean?*

"Pristine" means waters not subject to human interference through discharges or other activities within the catchment (Australian Water Quality Guidelines 1992).

##### **B: Recreational Water Quality & Aesthetics**

- (i) Primary contact
- (ii) Secondary contact
- (iii) Aesthetics

‘Primary contact’ means recreation involving bodily immersion / submersion where there is direct contact with water, & includes swimming, diving, surfing, water skiing.

‘Secondary contact’ means activities where there is some direct water contact, but it is unlikely that water will be swallowed (e.g. paddling, boating, and fishing).

‘Aesthetics’ means visual appearance of the water, being free from oil, grease, floating debris, unnatural colour, algal blooms etc.

### **C: Raw Water for Drinking Supply**

- (i) Subject to coarse screening only;
- (ii) Subject to coarse screening and disinfection.

This PEV applies to water used as the intake source for **public use** (town water supply, in other words) and to registered private water supplies.

It does not apply to the taking of water from surface waters by individuals for private use for the purposes of drinking etc.

The Director of Public Health recommends that raw water from any surface waterbody should be boiled before use.

### **D: Agricultural Water Uses**

- (i) Irrigation
- (ii) Stock watering

### **E: Industrial Water Supply**

The actual industry type must be specified in order to identify appropriate guidelines.

## **3.3 Community Input**

We asked the public to examine and provide comment on some water quality PEVs which the Board and regional planning authorities had suggested as a suitable starting point for surface waters of the Dorset and Break O’Day Municipal areas.

The community was asked if they agreed with the suggested PEVs for water quality, and why, or if they wished to propose other PEVs and why?

The community was asked the following:

- To identify specific areas of the rivers that may need different or additional PEVs (traditional fishing areas, for example).
- Are there rare or endangered species in specific locations which need to be acknowledged?
- Are there specific locations or stretches of river which need different PEVs (traditional swimming holes, for example)?
- Are there existing values and uses under threat from deteriorating water quality.

The Board and the regional planning authorities considered and took account of all submissions before finalising the PEVs for these wetlands and waterways.

## 4 PROTECTED ENVIRONMENTAL VALUES FOR CATCHMENTS WITHIN THE DORSET & BREAK O'DAY MUNICIPAL AREAS

The public discussion paper – *Proposed Environmental Management Goals for Tasmanian Surface Waters: Dorset and Break O'Day Municipal Areas* – was developed by the Department of Primary Industries, Water & Environment in consultation with local government and Parks officers. This paper explained the Policy and how the PEVs are identified and used.

The discussion paper was released in June 2000 and was circulated amongst agencies and organisations having an interest in surface waters in the region. The identified stakeholders and community were then invited to participate in regional water values workshops at Scottsdale (16 May 2001), Derby (17 May 2001) and St Helens (18 May 2001). The meetings were advertised in the Examiner Public Notices (28 April 2001), the North Eastern Advertiser (9 May 2001) and in the community notices section of the local radio station 7SD. These meetings were followed by an extended comment period until the end of May. Information collected from the meetings was compiled, amendments were made to the PEVs and discussion paper and they were sent back to all stakeholders and workshop attendees for further comment. Comments received were included in the discussion paper or in the Community Water Values.

Information collected on PEVs and Community Water Values will be incorporated into the future development of water management and catchment management plans.

Community Water Values should be incorporated into the future

development of water management and catchment management plans.

The PEVs for the surface waters within the Dorset and Break O'Day Municipal Areas are described in Table 5 under land use categories (as shown on the map available from the DPIWE website.

The PEVs apply to all surface waters within each land tenure category, other than<sup>17</sup>:

- privately owned waters that are not accessible to the public and are not connected to, or flow directly into, waters that are accessible to the public; or
- waters in any tank, pipe or cistern.

“Privately owned waters” means any surface waters confined within the boundary of privately owned land and which do not flow into, or do not communicate with:

- (a) the sea or arm or creek of the sea;
- (b) a source of supply for a water district or irrigation water district;
- (c) any river, stream, watercourse, lake, pond or marsh.

Management of all surface waters within the catchment shall focus on the achievement of water quality objectives.

The water quality objectives will be determined by the Board of Environmental Management and Pollution Control in accordance with

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<sup>17</sup> State Policy on Water Quality Management 1997

*the State Policy on Water Quality Management 1997.*

Achievement of these water quality objectives will maintain or enhance the water quality of those surface waters to ensure the protection of all of the following values and uses applying to each land use category. These values and uses are derived from the formal PEVs listed in Clause 7 of the Policy.

In general, diffuse source pollution can be managed to protect the PEVs by compliance with approved codes of practice, or by development and implementation of best practice environmental management guidelines where codes are not available.

In general, point source pollution should be managed to protect the PEVs by implementation of best practice environmental management, and by compliance with emission limits set by the regulatory authority. This may also require the setting of a mixing zone by the Board of Environmental Management and Pollution Control. For specific details refer to Part 4 of the Policy.

**Protected Environmental Values reflect current values and uses of a water body but do not necessarily imply that the existing water quality will support these values and uses.**

**Table 5: Protected Environmental Values for the Dorset & Break O’Day Municipal Areas**

Land Tenure	Protected Environmental Values*(see notes on page 22)
<p>For all surface waters within <b>private land</b> (including forests on private land)</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> <li>(ii) Protection of modified (not pristine) ecosystems from which edible fish are harvested</li> </ul> <p>B: Recreational Water Quality &amp; Aesthetics</p> <ul style="list-style-type: none"> <li>(i) Primary contact water quality (Scout Cabin on the Great Forester, Ringarooma between Derby and Mutual Bridge, Ringarooma at Talawa and Barnetts Swimming Hole, Dorset River at Dead Horse Hill, Derby Mine Hole, Derby, Branxholm, Avenue River at the Causeway)</li> <li>(ii) Secondary contact water quality</li> <li>(iii) Aesthetic water quality</li> </ul> <p>C: Raw Water for Drinking Water Supply (Scottsdale, Bridport, Ringarooma, St Helens, Legerwood, Nabowla)</p> <ul style="list-style-type: none"> <li>(ii) Subject to coarse screening plus disinfection</li> </ul> <p>D: Agricultural Water Uses</p> <ul style="list-style-type: none"> <li>(i) Irrigation</li> <li>(ii) Stock watering</li> </ul> <p>E: Industrial Water Supply (Hydro Electric Power Generation, Fish Farming – Lower Brid River and Upper Great Forester)</p> <p>That is, as a minimum, water quality should be managed to provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish may be harvested; that is suitable to supply town drinking water (subject to coarse screening plus disinfection) at Scottsdale, Bridport, Ringarooma, St Helens, Legerwood and Nabowla; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in primary and secondary contact recreation activities such as swimming (at Scout Cabin on the Great Forester, Ringarooma between Derby and Mutual Bridge, Ringarooma at Talawa and Barnetts Swimming Hole, Dorset River at Dead Horse Hill, Derby Mine Hole, Derby, Branxholm, Avenue River at the Causeway), paddling or fishing in aesthetically pleasing waters and is suitable for hydro electric power generation for the Moorina Power Scheme and suitable for fish farming on the Lower Great Forester and Upper Brid Rivers.</p>

<b>Land Tenure</b>	<b>Protected Environmental Values</b> *(see notes on page 22)
<b>Ruby Lagoon</b>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> <li>(ii) Protection of a modified (not pristine) ecosystem from which edible fish are not harvested</li> </ul> <p>B: Recreational Water Quality and Aesthetics</p> <ul style="list-style-type: none"> <li>(iii) Aesthetic water quality</li> </ul> <p>That is, as a minimum, water quality shall be maintained to provide water of a physical and chemical nature to support a modified ecosystem from which edible fish may not be harvested and to maintain any aesthetic qualities of the Lagoon.</p>
<b>Blue Lakes</b>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> <li>(ii) Protection of a modified (not pristine) ecosystem from which edible fish are not harvested</li> </ul> <p>B: Recreational Water Quality and Aesthetics</p> <ul style="list-style-type: none"> <li>(iii) Aesthetic water quality</li> </ul> <p>That is, as a minimum, water quality shall be maintained to provide water of a physical and chemical nature to support a modified ecosystem from which edible fish may not be harvested and to maintain any aesthetic qualities of the lakes.</p>
<b>Surface Waters on Un-allocated Crown Land</b>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> <li>(ii) Protection of modified (not pristine) ecosystems from which edible fish are harvested</li> </ul> <p>B: Recreational Water Quality and Aesthetics</p> <ul style="list-style-type: none"> <li>(i) Primary contact water quality</li> <li>(ii) Secondary contact water quality</li> <li>(iii) Aesthetic water quality</li> </ul> <p>D: Agricultural Water Uses</p> <ul style="list-style-type: none"> <li>(i) Irrigation</li> <li>(ii) Stock watering</li> </ul> <p>That is, as a minimum, water quality shall be managed to provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish may be harvested; that is suitable for irrigation and stock watering purposes; that allows people to safely engage in primary and secondary contact recreational activities such as swimming, rafting and fishing in aesthetically pleasing waters.</p>

<b>Land Tenure</b>	<b>Protected Environmental Values</b> *(see notes on page 22)
<p>For all surface waters within <b>State Forest</b> (managed under the <i>Forestry Act 1920</i>)</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality and Aesthetics</p> <p>(i) Primary contact water quality</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetics water quality</p> <p>C: Raw Water for Drinking Water Supply (Branxholm, Derby, Herrick, Pioneer, Scamander)</p> <p>(ii) Subject to coarse screening plus disinfection</p> <p>E: Industrial Water Supply (Hydro Electric Power Generation, Winnaleah Irrigation Scheme)</p> <p>That is, as a minimum, water quality should be managed to provide water of a physical and chemical nature to support a modified, but healthy aquatic environment from which fish may be harvested; that allows people to safely engage in primary and secondary contact recreational activities such as swimming and wading in aesthetically pleasing waters; and that is of a quality suitable to supply town drinking water (subject to coarse screening and disinfection) at Branxholm, Derby, Herrick, Pioneer and Scamander; and is suitable for Hydro electric power generation for the Moorina power scheme and for Winnaleah Irrigation Scheme.</p>
<p>Surface waters flowing through <b>Forest Reserves</b> from private land, state forest or un-allocated crown land*</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality &amp; Aesthetics</p> <p>(i) Primary contact water quality</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Supply (Gladstone)</p> <p>(ii) Subject to coarse screening plus disinfection</p> <p>E: Industrial Water Supply (Hydro Electric Power Generation)</p> <p>That is, as a minimum, water quality should be managed to provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish may be harvested; which will allow people to safely engage in recreation activities such as swimming, kayaking, paddling or fishing in aesthetically pleasing waters and that will be of a quality suitable to supply town drinking water (subject to coarse screening and disinfection) at Gladstone; and is suitable for Hydro electric power generation for the Moorina power scheme.</p>

<b>Land Tenure</b>	<b>Protected Environmental Values</b> *(see notes on page 22)
Surface waters that have their headwaters within <b>Forest Reserves</b>	<p>A: Protection of Aquatic Ecosystems</p> <p>(i) Protection of pristine or nearly pristine ecosystems having regard for the management objectives for forest reserves outlined in Schedule 3 of the <i>Forestry Act 1920</i>.</p> <p>B: Recreational Water Quality &amp; Aesthetics</p> <p>(i) Primary contact water quality</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>E: Industrial Water Supply (Hydro Electric Power Generation)</p> <p>That is, as a minimum, water quality should be managed to provide water of a physical and chemical nature to support a pristine or near pristine aquatic ecosystem and which will allow people to safely engage in recreation activities such as swimming, paddling or fishing in aesthetically pleasing waters and is suitable for hydro electric power generation for the Moorina power scheme.</p>
Surface waters flowing through <b>Nature Recreation, Conservation Areas, Regional Reserves or Game Reserves</b> from private land, state forest or unallocated crown land	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems from which edible fish can be harvested</p> <p>B: Recreational Water Quality Aesthetics</p> <p>(i) Primary contact water quality</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>That is, as a minimum water quality should be managed to provide water quality of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish may be harvested; and which will allow people to safely engage in recreation activities such as swimming, paddling or fishing in aesthetically pleasing waters.</p>
Surface waters with their headwaters within <b>Nature Recreation, Conservation Areas, Regional Reserves or Game Reserves</b>	<p>A: Protection of Aquatic Ecosystems</p> <p>(i) Protection of pristine or nearly pristine ecosystems</p> <p>B: Recreational Water Quality and Aesthetics</p> <p>(i) Primary Contact Water Quality</p> <p>(ii) Secondary Contact Water Quality</p> <p>(iii) Aesthetic Water Quality</p> <p>That is, as a minimum water quality should be managed to provide water quality of a physical and chemical nature to support a pristine or nearly pristine aquatic ecosystem from which edible fish may be harvested; and which will allow people to safely engage in recreation activities such as swimming, paddling or fishing in aesthetically pleasing waters.</p>

<b>Land Tenure</b>	<b>Protected Environmental Values</b> *(see notes on page 22)
<p>Surface waters flowing through <b>National Parks</b> (Douglas Apsley, Mount William ) or <b>State Reserves</b> (St Marys Pass, St Patricks Head, St Columba Falls and Little Beach) from private land, state forests or un-allocated crown land</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(iii) Protection of modified (not pristine) ecosystems from which edible fish are harvested having regard for the management objectives outlined in Schedule 1 of the <i>National Parks and Reserves Management Act 2002</i></p> <p>B: Recreational Water Quality &amp; Aesthetics</p> <p>(i) Primary contact water quality</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>That is, as a minimum, water quality should be managed to provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish may be harvested; which will allow people to safely engage in recreation activities such as swimming, paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface waters that have their headwaters within <b>National Parks</b> (Douglas Apsley, Mount William ) or <b>State Reserves</b> (St Marys Pass, St Patricks Head, St Columba Falls and Little Beach)</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(i) Protection of pristine or nearly pristine ecosystems having regard for the management objectives outlined in Schedule 1 of the <i>National Parks and Reserves Management Act 2002</i></p> <p>B: Recreational Water Quality &amp; Aesthetics</p> <p>(i) Primary contact water quality</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>That is, as a minimum, water quality should be managed to provide water of a physical and chemical nature to support a pristine or near pristine aquatic ecosystem which will allow people to safely engage in recreation activities such as swimming, paddling or fishing in aesthetically pleasing waters.</p>

Land Tenure	Protected Environmental Values*(see notes on page 22)
All Estuarine surface waters	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems from which edible fish, shellfish and crustacea are harvested</p> <p>B: Recreational Water Quality and Aesthetics</p> <p>(i) Primary contact water quality</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>E: Industrial Water Supply (Fish Farming – Brid Estuary)</p> <p>That is, as a minimum, water quality should be managed to provide water of a chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish, shellfish and crustaceans may be harvested; which allows people to safely engage in activities such as swimming, boating or fishing in aesthetically pleasing waters; and to allow fish farming practices to be conducted on the Brid Estuary.</p>

Notes:

- \* this does **not** include PEVs for areas of the South Esk Catchment that are within these municipalities. For further information on the South Esk refer to the paper: “Environmental Management Goals for Tasmanian Surface Waters: Macquarie and South Esk River Catchments”
- \*\* Historic mining activities or other historic land uses may have resulted in long term water quality impacts to streams or rivers within these land tenures and their associated ecosystems. This may mean that the water quality in these rivers or streams may not currently support pristine or nearly pristine ecosystems or primary contact recreational activities. This should be taken into consideration at the time that management decisions are being made for individual rivers, creeks or streams.

## 5 WATER QUANTITY VALUES FOR WITHIN THE DORSET & BREAK O'DAY MUNICIPAL AREAS

### 5.1 Overview

While water quality is a very important part of any water management regime, the issue of how much water a river or stream carries, and how that flow is managed, is of equal importance. Water quality and quantity are closely linked.

The State Government intends to re-organise the way water flow in our rivers and streams is managed, and one of the key understandings is that there needs to be a specific allocation of water for the river or stream itself. This is necessary not only to protect the aquatic life of the river, but also to maintain basic 'river health'. If there is insufficient flow at crucial times of the year, the overall quality of the remaining water may be badly affected. This will very likely have a negative effect on human uses of the water, as well as on the environment.

In some instances there may be competing uses for the available resource, and that there may need to be trade-offs to ensure a balanced sharing arrangement between human uses and the needs of the river environment.

The allocation of water for the environment must be based on scientific information, and on legitimate community values and uses.

### 5.2 Water quantity values

Five broad categories of water quantity values have been identified, and as with the water quality PEVs, it is likely that most rivers will attract more than one value/use category. The categories are:

- Ecosystem values;
- Physical landscape values.
- Consumptive and non-consumptive use values;

- Recreation values;
- Aesthetic landscape values;

Your advice will provide input into a broader process aimed at gathering water management values from stakeholders, community groups and government agencies. This information will be utilised when water management planning for your catchment is undertaken however, water management goals have already been established for some areas as shown in Table 6.

An appraisal of water quantity values will be undertaken in order to develop water management goals for the catchment. This will be undertaken during the water management planning process. When you consider your values you may find that you value one more than another, particularly where there may be insufficient water available to look after all of them. If you feel that you can prioritise your values in order of importance if water availability becomes a problem, then please do so.

An explanation of the water quantity value categories and examples of specific values are given below:

#### Ecosystem values

The term is used to identify those values which are to be protected and / or enhanced in the current state of aquatic and adjacent land ecosystems. Specific water values associated with the ecosystem value category may be:

- protection of an endangered species (plant or animal);
- protection or improvement in native fish populations;
- protection of riverine vegetation;

- provision of adequate water for stream habitat for flora and fauna;
- provision of water for wetland and/or estuary ecosystems.

#### Physical Landscape Values

These values are closely related to the physical nature of the catchment. This includes the nature and constitution of channels, the frequency of floods and droughts, soil and rock types, and vegetation coverage. These values are also closely associated with ecosystem function, and may overlap with the protection of ecosystem values. Specific water values associated with physical landscape values may include:

- provision of variable flows;
- prevention of unnatural erosion;
- protection or improvement of riparian zone.

#### Consumptive and Non-Consumptive Use Values

These are related to the current and potential human uses of water bodies. Consumptive use refers to the extraction of water from the water body, with no return of it to the waterbody. Examples may include:

- provision of water for irrigation;
- provision of water for town supply;
- provision of water for industry.

Non-consumptive use refers to extraction or use of water, where the water is eventually returned to the river. Examples may include:

- use of water for hydro-electricity generation;
- use of water for fish farming.

#### Recreational Values

These include the range of direct human uses of water bodies for purposes such as kayaking, canoeing, sailing, swimming, fishing etc. This type of value is difficult to quantify, but is an essential part of our way of life in

Tasmania. Water quality issues are also important, especially where primary contact occurs (swimming for example), or where the recreational activity relies on a base of good quality water, such as a recreational fishery. Examples may include:

- maintenance or improvement of the quantity (and quality) of water for recreational fishery (trout, blackfish etc);
- provision of sufficient water for whitewater rafting;
- provision of sufficient water (of adequate quality) for swimming.

#### Aesthetic Landscape Values

These values relate to human appreciation of water and adjacent environments. It is often extremely difficult to address these types of values, or work out the flow requirements to ensure their protection. They are, however, legitimate values which must be acknowledged in any good management process. Examples may include:

- maintenance or improvement of flow through gorges or over waterfalls;
- protection of scenic features in a river.

The Community Water values identified through the PEVs process can therefore be considered when making management decisions for water quality.

## 6 Community Water Values for the Dorset and Break O’Day Municipal Areas

Tables 6 through 10 summarise Community Water Values collected at a number of workshops in the Dorset and Break O’Day Municipal Areas. These values relate to both water quality and water quantity.

**Table 6: Community Water Values for the Great Forester Catchment collected at the October 1999 meeting of the Brid-Forester River Integrated Catchment Management Group**

Water Value Categories	Specific Water Values, Great Forester Catchment
<b>Ecosystem Values</b>	<ul style="list-style-type: none"> <li>❖ Maintain or improve water quality               <ul style="list-style-type: none"> <li>• Improve low flow quantities</li> <li>• Maintain flows for floral and faunal stream habitat</li> <li>• Protect <i>Astacopsis gouldii</i></li> <li>• Protect whitebait and blackfish fisheries</li> </ul> </li> <li>❖ Avoid algal blooms               <ul style="list-style-type: none"> <li>• Maintain adequate flows into estuary</li> </ul> </li> <li>• Protect riparian zone</li> </ul>
<b>Consumptive and Non-Consumptive Use Values</b>	<ul style="list-style-type: none"> <li>• Maintain sufficient water for Scottsdale water supply</li> <li>• Maintain flows for riparian use (stock and domestic)</li> <li>• Maintain water for fish farming</li> <li>• Maintain flows for industry</li> <li>• Maintain flows for irrigation</li> <li>• Establish a water rationing/emergency plan for water use</li> <li>• Improve water storage and timing of take</li> </ul>
<b>Recreational Values</b>	<ul style="list-style-type: none"> <li>• Maintain or improve whitebait fishery in lower Great Forester</li> <li>• Maintain or improve blackfish and trout fisheries</li> <li>❖ Maintain water quality for swimming and recreation at Scouts cabin               <ul style="list-style-type: none"> <li>• Canoeing</li> <li>• Platypus watching</li> </ul> </li> </ul>
<b>Physical Landscape Values</b>	<ul style="list-style-type: none"> <li>❖ Reduce riverbank erosion and loss of land</li> <li>❖ Reduce catchment scale erosion               <ul style="list-style-type: none"> <li>• Protect or improve riparian zone</li> <li>• ‘The Cut’</li> </ul> </li> </ul>

Water Value Categories	Specific Water Values, Great Forester Catchment
Aesthetic Values	<ul style="list-style-type: none"> <li>❖ Reduce unnatural turbidity</li> <li>❖ Reduce incidence of green slimes and algae</li> <li>• Maintain/improve riparian zone</li> <li>• Remove unnatural objects from river</li> <li>• Maintain adequate flows over Cuckoo Falls</li> </ul>

❖ Values that are directly related to water quality

### Ecosystem Values Identified by the Department of Primary Industries, Water and Environment for the Great Forester Catchment

(N.B.: all are of equal priority)

- *Astacopsis gouldii* (giant freshwater crayfish)
- *Prototroctes maraena* (grayling)
- *Galaxiella pusilla* (dwarf galaxiid)
- *Engaeus spinicaudatus* (Scottsdale burrowing crayfish) - an obligate riparian vegetation dweller
- Rearing and spawning habitat for *G. maculatus* and *G. truttaceus*; spawning for grayling in particular, as well as for lampreys, blackfish, trout, estuarine perch, sandies
- Macrophytes - these are of botanical importance as well as a habitat for macroinvertebrates
- White Gum (*E. viminalis*) country is important botanically
- Ricegrass is a minor problem in Bridport

**Table 7: Community Water Values for the Ringarooma Catchment collected at the meeting of the Ringarooma Integrated Catchment Management Group held at Derby on 8 December 1999)**

<b>Water Value Categories</b>	<b>Specific Water Values, Ringarooma Catchment</b>
<b>Ecosystem Values</b>	<ul style="list-style-type: none"> <li>• Protect natural forests in the headwaters of the catchment</li> <li>• Maintain water quality</li> <li>• Preserve river fauna</li> <li>• Maintain stream habitat for flora and fauna</li> <li>• Maintain and/or improve summer flows</li> <li>• Protect Ramsar wetland</li> </ul>
<b>Consumptive and Non-Consumptive Use Values</b>	<ul style="list-style-type: none"> <li>• Maintain flows and water quality for human consumption</li> <li>• Maintain flows and quality for riparian use (stock and domestic)</li> <li>• Maintain flows for irrigation</li> <li>• Maintain flows for industry</li> </ul>
<b>Recreational Values</b>	<ul style="list-style-type: none"> <li>• Maintain trout, blackfish and eel fisheries</li> <li>• Maintain water quality for swimming</li> <li>• Maintain flows and quality for the Derby River Derby</li> <li>• Maintain flows and quality for canoeing</li> <li>• Maintain the river system for educational purposes</li> </ul>
<b>Physical Landscape Values</b>	<ul style="list-style-type: none"> <li>• Preserve geological formations - boulders, gorges, falls and rapids (including Ralphs Falls and Cash's Gorge)</li> <li>• Preserve wetlands</li> <li>• Preserve existing mix of rural and forested landscape</li> <li>• Preserve heritage landscape (e.g. water races)</li> </ul>
<b>Aesthetic Values</b>	<ul style="list-style-type: none"> <li>• Maintain aesthetic river qualities for tourism and ecotourism</li> <li>• Maintain/improve riparian zone</li> <li>• Maintain historical and heritage values</li> <li>• Maintain educational values and experiences of the river</li> <li>• Improve control of erosion and weeds</li> <li>• Restrict introduction of non-native flora</li> </ul>

**Ecosystem Values Identified by the Department of Primary Industries, Water and Environment for the Ringarooma Catchment**

(N.B.: all are of equal priority)

- *Astacopsis gouldii* (Giant freshwater crayfish)
- *Galaxiella pusilla* (dwarf galaxiid)
- *Prototroctes maraena* (Grayling)
- Rearing and spawning habitat for *G. maculatus* and *G. truttaceus*, spawning for grayling in particular, as well as for lampreys, blackfish, trout, estuarine perch, sandies.
- Macrophytes - these are of botanical importance as well as habitat for macroinvertebrates.
- Ringarooma R is affected by the sediment wave from the mine tailings (dilution issue).

**Table 8: Community Water Values collected at the Scottsdale Public and Stakeholder Workshop held on 16 May 2001**

Water Value Categories	Specific Water Values, Scottsdale
<p><b>Ecosystem Values</b></p>	<ul style="list-style-type: none"> <li>• Maintain quality to support whitebait fisheries in lower Great Forester</li> <li>• Maintain waterbird habitat in Blackmans Lagoon and the RAMSAR wetland – Little Waterhouse.</li> <li>• Maintenance and protection of the local wetlands.</li> <li>• Maintain water quality of a suitable level to sustain native galaxiids (<i>Galaxiella pusilla</i>), giant fresh water crayfish (<i>Astacopsis gouldi</i>), Scottsdale burrowing crayfish (<i>Engaeus spinicaudatus</i>) and the Mt Arthur crayfish.</li> <li>• Green and Gold tree frogs (<i>Litoria raniformis</i>) and some other species have been returning to the area in the last five years so maintenance of the environment so this species remains in the area is highly valued.</li> <li>• Maintain frog and duck populations in Blue Lake.</li> <li>• Maintain water quality to a support platypie and eel populations in most streams.</li> <li>• Maintain habitat and water quality that is suitable for maintenance of Australian graylings particularly on the east coast.</li> <li>• Maintenance of blackfish populations in most streams.</li> <li>• Maintenance of native freshwater snail species (<i>Beddomeia briansmithi</i>, <i>Beddomeia fromensis</i>, <i>Beddomeia minima</i> and <i>Beddomeia tasmanica</i>).</li> <li>• Maintain the natural interactions of wildlife with the natural streams.</li> <li>• Maintenance of a rare water plant species (further information to be clarified once identification is carried out).</li> <li>• Maintain areas of healthy native vegetation for its value as shade, maintaining water quality, aesthetics and bank maintenance.</li> <li>• Maintain natural forests in the upper catchments.</li> <li>• Maintenance of riparian vegetation however native riparian vegetation is more highly valued than non native vegetation.</li> <li>• Maintain bank vegetation and areas where erosion is not an issue. Erosion is a problem in these catchments.</li> <li>• Maintain low sediment loads in streams particularly in the Brid River.</li> <li>• Maintain environmental flows in streams.</li> <li>• Maintain and increase areas where stock are excluded from streams as this reduces turbidity and faecal contamination and aids the maintenance of native vegetation.</li> </ul>

<b>Water Value Categories</b>	<b>Specific Water Values, Scottsdale</b>
<b>Consumptive and Non-Consumptive Use Values</b>	<ul style="list-style-type: none"> <li>• Maintain water quality suitable for fish farming on the lower Brid Forester Estuary.</li> <li>• Maintain Water Quality in the upper reaches of the Great Forester for fish farming (fish hatchery).</li> <li>• Fish processing on the Lower Brid River.</li> <li>• Maintain adequate flows to power the Moorina power station (Hydro).</li> <li>• Maintain water quality at a level which is suitable for Bridport water supply on the Brid River and Nabowla water supply.</li> <li>• Maintain water quality at a level that is suitable for homestead use throughout all catchments.</li> <li>• Maintain water quantity and quality that is suitable for Auspine and Frenchpine for the purposes of on site storage for fire fighting purposes.</li> </ul>
<b>Recreational and Aesthetic Values</b>	<ul style="list-style-type: none"> <li>• Swimming in Lower Brid Forester Estuary</li> <li>• Swimming near the Scout Cabin on the Great Forester.</li> <li>• Swimming in the Ringarooma Catchment for the Derby River Derby.</li> <li>• Swimming and paddling in all waterways by local residents in the area.</li> <li>• Swimming in Monchin Dam which is on a tributary of the Ringarooma Catchment.</li> <li>• Swimming at Little Mussleroe Estuary</li> <li>• Maintain water quality suitable for swimming and water skiing at Branxholm, Derby, Valley Pond and Blue Lake.</li> <li>• Maintain water quality in Pioneer dam which is suitable for water skiing.</li> <li>• Maintain the water quality of the Ringarooma for rafting and canoeing.</li> <li>• Maintain water quality and flows to allow canoeing on the Boobyalla River.</li> <li>• Maintain water quality near Mt Cameron for school camp activities and canoeing.</li> <li>• Maintain water flows and quality to allow gem fossicking to continue in Main Creek, Fly By Night Creek (Gladstone) and Weld River.</li> <li>• Fishing <ul style="list-style-type: none"> <li>❖ Great Forester and all other major waterways (trout)</li> <li>❖ Big Waterhouse (trout)</li> <li>❖ Little Waterhouse (trout)</li> <li>❖ Blackmans Lagoon (trout)</li> </ul> </li> </ul>

Water Value Categories	Specific Water Values, Scottsdale
	<ul style="list-style-type: none"> <li>❖ Branxholm</li> <li>• Maintain aesthetic value of North East Park near Tuckers Creek.</li> <li>• Maintain aesthetics of Great Forester Gorge near Forester Road.</li> <li>• Maintain aesthetic values of local waterfalls but in particular Cuckoo Falls (on Hogarth River), Ralph Falls, St Columba Falls and Halls Falls.</li> <li>• Maintain the aesthetic quality of Denison Gorge on the Little Forester River.</li> <li>• Maintain aesthetics for wildlife and wilderness tour operations to continue.</li> </ul>
<b>Other Issues</b>	<ul style="list-style-type: none"> <li>• Lower the percentage of forests that are harvested to prevent excessive erosion. ie In accord with the Forestry Code of Practice by not logging large tracts of land at one time.</li> <li>• Larger buffer zones should be required on smaller waterways in upper catchments to maintain water quality and water quantity.</li> <li>• The amount of land under a reserve category is disproportionate across the catchment and there is minimal land under reserve in the Little Forester catchment.</li> <li>• Maintain or enhance the amount of forest reserve within the catchment as it helps conserve the water flows and water quality in catchments. The increases in plantation forestry could have implication on water quantity in catchments.</li> </ul>

**Table 9: Community Water Values collected at the Derby Public and Stakeholder Workshop held on 17 May 2001**

Water Value Categories	Specific Water Values, Derby
<b>Ecosystem Values</b>	<ul style="list-style-type: none"> <li>• Maintenance of healthy platypus communities.</li> <li>• Maintenance of instream habitat to support <i>astacopsis gouldi</i> (fresh water crayfish) and burrowing crayfish.</li> <li>• Maintenance of healthy fish populations in streams particularly trout, blackfish and whitebait.</li> <li>• Maintain healthy eel populations in waterways.</li> <li>• Maintain goshawk populations.</li> <li>• Maintain areas of native flora and fauna.</li> <li>• Maintain riparian vegetation for healthy waterways and for its shade values.</li> <li>• Maintain areas free of cracked willows.</li> <li>• Value the maintenance of native vegetation of Dorset River and value less highly areas containing willows.</li> <li>• Maintain native areas of catchments and reduce the areas of catchments that are infected with non native species (weeds).</li> <li>• Maintain or improve instream aquatic habitat by not removing woody debris and other riverbed material from waterways.</li> <li>• Maintain areas of natural forests particularly where they occur at the headwaters of waterways.</li> <li>• Maintain low water temperatures to sustain the current variety of aquatic life.</li> <li>• Maintain the RAMSAR wetland on the Lower Ringarooma.</li> <li>• Maintain areas of streams without manmade barriers within them that prevent fish passage.</li> <li>• Maintain streams that are free of human made chemicals.</li> <li>• Maintain waterways to be free of industrial discharges.</li> </ul>
<b>Consumptive/ Non Consumptive Values</b>	<ul style="list-style-type: none"> <li>• Maintain and encourage the practice of collecting winter water flows in dams for use in summer.</li> <li>• Maintain areas free of plantation forestry due to the impacts forestry has on water yields in the catchment.</li> <li>• Maintain balanced water use within the catchment.</li> <li>• Maintain water quality at a level that is suitable for homestead use throughout all catchments.</li> <li>• Maintain Winnaleah irrigation scheme for its use for irrigation, homestead use and drinking. This is a major agricultural water scheme for the area.</li> </ul>

<b>Water Value Categories</b>	<b>Specific Water Values, Derby</b>
	<ul style="list-style-type: none"> <li>• Maintain the value of flow in intermitten streams during the irrigation season, this flow is created from irrigation runoff and water table increases.</li> <li>• Maintain adequate flows to power the Moorina power station (Hydro).</li> <li>• Maintain quality and quantity of water suitable for the tin mine operation on the Ringarooma.</li> <li>• Maintain quality and quantity of water suitable for fire control for the Branxholm and Black Creek saw mills.</li> <li>• Maintain water quality at a level that is suitable to sustain eel populations for harvesting on all major rivers.</li> <li>• Maintain water quality at a level that is suitable for fish farming on the Upper and Lower Brid River.</li> </ul>
<b>Recreational and Aesthetic Values</b>	<ul style="list-style-type: none"> <li>• Swimming between Derby and Mutual Bridge on the Ringarooma River for the Derby River Derby.</li> <li>• Maintenance of water quality and quantity that is suitable for rafting particularly for the Derby River Derby.</li> <li>• Swimming on Ringarooma River</li> <li>• Swimming on the Ringarooma at Talawa and Barnetts Swimming Hole.</li> <li>• Swimming on the Dorset River at Dead Horse Hill</li> <li>• Swimming on the Ringarooma River at Mutual.</li> <li>• Maintain water quality in Blue Lake that is suitable for swimming, waterskiing and boating.</li> <li>• Maintenance of water quality that is suitable for swimming or diving in the following locations: <ul style="list-style-type: none"> <li>❖ Valley Pond</li> <li>❖ Derby Mine Hole</li> <li>❖ Gordon</li> <li>❖ Mini Jesup</li> <li>❖ Pioneer Mine Hole</li> </ul> </li> <li>• Swimming by property owners in the streams that run via their properties occurs in all streams.</li> <li>• Maintenance of water quality that is suitable for waterskiing on the flowing Mine Holes: <ul style="list-style-type: none"> <li>❖ Valley Pond</li> <li>❖ Derby Mine Hole</li> <li>❖ Pioneer Mine Hole</li> <li>❖ Blue Lake</li> </ul> </li> </ul>

Water Value Categories	Specific Water Values, Derby
	<ul style="list-style-type: none"> <li>• Maintain water quality at the Scout Cabin on the Great Forester at a level that is suitable for swimming and other recreational activities.</li> <li>• Maintain water quality and aesthetics of all major rivers and dams for their use as recreational camping areas.</li> <li>• Maintain water quality and flows to allow canoeing on the lower reaches of the Ringarooma and Great Forester Rivers.</li> <li>• Maintain water flows and quality to allow gem fossicking to continue within most of the rivers systems in the area particularly Weld River.</li> <li>• Fishing <ul style="list-style-type: none"> <li>❖ Wyniford Creek</li> <li>❖ Dorset River</li> <li>❖ Caris Brook</li> <li>❖ Legerwood Creek</li> <li>❖ Boobyalla River</li> <li>❖ Ringarooma (Trout, Blackfish, Eels)</li> <li>❖ Mussleroe River Estuary(Marine fish species)</li> <li>❖ Maurice River on the Ringarooma</li> <li>❖ Ansons River</li> <li>❖ Tomahawk River</li> <li>❖ Brid Forester River</li> <li>❖ Frome River and Frome Dam</li> <li>❖ Cascade Dam</li> <li>❖ Derby mine Hole</li> <li>❖ Valley Pond (located between Derby and Branxholm)</li> <li>❖ Mini Jesup</li> <li>❖ Pioneer Mine Hole</li> <li>❖ Scamander River (Bream at mouth)</li> </ul> </li> <li>• Maintain duck populations on rivers for the purposes of duck shooting.</li> <li>• Maintain aesthetic values and tourist values of local waterfalls but in particular Cuckoo Falls, Ralph Falls, Halls Falls, St Columba Falls and Krushka Falls.</li> <li>• Maintain water quality at a suitable level for canoeing on Scamander River.</li> <li>• Maintain the aesthetic values of the Groom River particularly for photography.</li> <li>• Maintain the aesthetic quality of the Forester Gorge on the Great Forester River</li> </ul>

<b>Water Value Categories</b>	<b>Specific Water Values, Derby</b>
	<ul style="list-style-type: none"> <li>• Maintenance of native vegetation and access along rivers, access to waterfalls and to heathland lagoons for walking.</li> <li>• Maintain aesthetics and recreational values of picnicking locations adjacent to rivers particularly Ralph Falls Reserve and the lagoons in the area.</li> <li>• Maintain walking tracks for their aesthetic and tourist value particularly the following areas: Ringarooma River between Derby and Moorina, Dorset River junction and Branxholm and Black Creek Ravine and falls (a fluvial based amenity).</li> <li>• Maintain Wyniford River and Blue Tiers for its aesthetics and walking from the headwaters to the River mouth.</li> <li>• Maintenance of trails for trail bike riding and horse riding.</li> </ul>
<b>Other Issues</b>	<ul style="list-style-type: none"> <li>• Maintain the Old Railway heritage track which passes around the Lagoons and Sloop Rock.</li> <li>• Manage silt and sediment from past tin mining practices as it is slowly moving down the Ringarooma River.</li> <li>• Maintain salinity free status of Tomahawk and Boobyalla catchments which are salinity prone areas.</li> <li>• Maintain and control erosion created by agricultural practices and other industrial sectors.</li> <li>• Concern about the potential for chemical spills and industrial pollution in waterways.</li> <li>• Maintain septic tanks to reduce as far as practicable their impact on water quality.</li> <li>• Continue rehabilitation of old mining areas to prevent further erosion and runoff to waterways.</li> <li>• Concern about the impact on waterways of both urban and rural areas from road works and road spills.</li> </ul>

**Table 10: Community Water Values collected at the St Helens Public and Stakeholder Workshop held on 18 May 2001**

Water Value Categories	Specific Water Values, St Helens
<b>Ecosystem Values</b>	<ul style="list-style-type: none"> <li>• Maintain water quality in Georges River that is suitable to support Australian grayling populations.</li> <li>• Maintain healthy platypie populations in all rivers and creeks.</li> <li>• Maintain water quality in the Great Mussleroe to support <i>astacopsis gouldi</i> (freshwater crayfish) between the altitudes of 200 and 400 metres.</li> <li>• Maintain water quality in St Mary's Rivulet and Mount Elephant to support <i>astacopsis franklini</i> (freshwater crayfish).</li> <li>• Maintain water quality to support burrowing crayfish species.</li> <li>• Maintenance of the swan galaxiid species in the Douglas and Denison Rivers.</li> <li>• Maintain Mountain Trout in the Break O'Day River.</li> <li>• Maintain blackfish populations in Georges River and Jocks Lagoon</li> <li>• Maintain quality of water to support various galaxiid species throughout most of the catchments in the region.</li> <li>• Maintain eel populations in waterways.</li> <li>• Maintain water quality to support Lamprey populations in the coastal area of the Groom River.</li> <li>• Maintain water quality to support native water rat species.</li> <li>• Maintain the following bird species within the local catchments: sea eagles, wedgetail eagles, white hawks, sparrow hawks, goshawks, kookaburras, magpies, native hens, wild duck species including mountain ducks, tiel ducks, wood ducks and black ducks, royal spoonbills, white egrets, grey egrets, migratory wader including greenshanks, white faced blue cranes, and cormorants.</li> <li>• Maintenance of water quality to support migratory waders on Georges Bay.</li> <li>• Maintain riparian vegetation to support snake species.</li> <li>• Maintain Green and Gold tree frogs (<i>Litoria raniformis</i>), white frog and froglet populations.</li> <li>• Maintenance of native macroinvertebrate species in all streams such as stoneflies and mayflies.</li> <li>• Maintain water quality at a suitable level to sustain seagrass populations in Georges Bay.</li> <li>• Maintain low sediment loads in streams.</li> <li>• Maintain low turbidity levels and the high clarity in the Groom River, Ransom River, Georges River, Douglas River and Apsley River.</li> <li>• Waters of the Groom and Ransom Rivers are very acidic.</li> </ul>

Water Value Categories	Specific Water Values, St Helens
	<ul style="list-style-type: none"> <li>• Maintain areas of dense native riparian vegetation.</li> <li>• Maintain areas of riparian vegetation that is free of environmental weeds including: ragwort, cumbungi (bull rush), water hyacinth, paraquatica, willows, blackberries, fox gloves, gorse and broom.</li> <li>• Maintain the riparian vegetation around the Great Mussleroe River, Ransom River, Groom River and Dawns Rivulet as it is rainforest type vegetation and are remaining areas of glacial refugia.</li> <li>• Maintain and nominate St Helens Point wetlands on to the RAMSAR wetlands list, for their International significance regarding their micro algae species and several other unique and threatened species.</li> <li>• Maintain Jock Lagoon and the RAMSAR wetland for its migratory birds.</li> <li>• Value and maintain areas of the South Esk Pine on the Apsley River as well as tree ferns and other ferns and native orchids in catchments.</li> <li>• Maintenance of streams to prevent illegal dumping.</li> </ul>
<b>Consumptive/ Non Consumptive Values</b>	<ul style="list-style-type: none"> <li>• Maintain water quality at a level that is suitable for homestead use throughout the catchments.</li> <li>• Maintain water quality suitable for St Helens town water supply.</li> </ul>
<b>Recreational and Aesthetic Values</b>	<ul style="list-style-type: none"> <li>• Swimming <ul style="list-style-type: none"> <li>❖ South George River below St Columba Falls</li> <li>❖ Swimming below the intake bridge near St Columba Falls</li> <li>❖ Georges Bay</li> <li>❖ Dianas Lagoon</li> <li>❖ Henderson Lagoon</li> <li>❖ Grants Lagoon</li> <li>❖ Big Lagoon</li> <li>❖ Scamander River</li> <li>❖ Avenue River upstream of the Causeway</li> <li>❖ Apsley River</li> </ul> </li> <li>• Maintain water quality in all waterways in the catchment at a level which is suitable for swimming as most people swim in the streams that run past their properties.</li> <li>• Maintain Prices Reach on the Scamander Estuary for waterskiing.</li> <li>• Maintain the quality of Ansons Bay at a level that will sustain kayaking, sail boarding, sailing, water skiing, canoeing and fishing.</li> <li>• Maintain water quality at a level that is suitable for canoeing on Big Lagoon, Grants Lagoon and Diane Basin.</li> <li>• Maintain all lagoons for their aesthetic qualities.</li> </ul>

Water Value Categories	Specific Water Values, St Helens
	<ul style="list-style-type: none"> <li>• Maintain Medeas Cove Sanctuary for its recreational and bird watching qualities.</li> <li>• Maintain fish populations for the purposes of fishing in all waterways in the region.</li> <li>• Fishing <ul style="list-style-type: none"> <li>❖ North George River</li> <li>❖ South George River</li> <li>❖ Groom River</li> <li>❖ Ransom River</li> <li>❖ Georges Bay</li> <li>❖ Dianas Lagoon</li> <li>❖ Henderson Lagoon</li> <li>❖ Grants Lagoon</li> <li>❖ Big Lagoon</li> <li>❖ Ansons Bay</li> </ul> </li> </ul>
<b>Other Issues</b>	<ul style="list-style-type: none"> <li>• The weir at Scamander that prevents salt water flowing up the catchment is valued.</li> <li>• Maintain or enhance the amount of forest reserve within the catchment as it helps conserve the water flows and water quality in catchments. The increases in plantation forestry could have implication on water quantity in catchments.</li> <li>• Effective management of plantations to prevent silting of rivers.</li> <li>• Many of the Rivers have remains of siltation and old tin mine slugs in them, the dissipation of these down the river should be managed as well as possible.</li> <li>• Maintain sewage ponds to prevent overflows in to sensitive environments.</li> <li>• Maintain areas free of stormwater discharges.</li> <li>• Maintain areas free of chemicals/sprays even at the scale of garden applications.</li> <li>• Manage and reduce forestry burn offs to reduce sediment, herbicide and ash runoff in to streams.</li> </ul>