



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

**ENVIRONMENTAL
MANAGEMENT
GOALS
for TASMANIAN
SURFACE WATERS**

FLINDERS MUNICIPAL AREA CATCHMENTS

November 2002



Environmental Management Goals

For Tasmanian Surface Waters:

Flinders Municipal Area Catchments

During 2001/2002 Protected Environmental Values (PEVs) were set for the Flinders Municipal Area. 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 Flinders Municipal Area.

The discussion paper was prepared by the Environment Division in association with the Land and Water Management Branch of the Department of Primary Industries Water and Environment, the Tasmanian Parks and Wildlife Service and the Flinders Island Council.

Words and expressions used in the discussion 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 discussion paper is divided into five main sections:

- The first part discusses water reform in general.
- The second part gives some general information relating to the area covered in the discussion paper.
- The third part discusses the *State Policy on Water Quality Management*.
- The fourth part discusses the Protected Environmental Values for the catchment.
- The fifth section discusses water quality and water quantity values

This paper has been modified into its current form to reflect that the process for setting PEVs for the Flinders Municipal Area is now complete. It was considered, however, that much of the information included in the discussion paper should remain as a record of the PEV setting process.

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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 water 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 sometimes 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. Our waterways are not immune from problems, however, and many of our river systems are showing signs of stress.

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.

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 recently introduced 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 by the use of best practice environmental management;
- 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 the discussion paper was to explain how the water quality values have been identified and could be used. Local communities had a key role in identifying these values in their catchments.

(b) water quantity management

The Government had recently finalised new water management legislation to replace the *Water Act 1957*. *The Water Management Act, 1999* provides 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 development of water management plans

The second purpose of this discussion paper was to canvas the public's views on what is valued in the 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. The following questions of the catchment stakeholders were asked. What uses or values do you have for surface waters in this area that rely upon maintaining or enhancing water quality? 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?

The catchment stakeholders/publics answers to these questions then help to develop the community water values for regional wetlands and waterways. 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. Therefore the public submissions providing local knowledge was important.

1.4 How will the public input be used?

Information from the public on values particularly relating to water quality assisted the Board of Environmental Management and Pollution Control and the Flinders Council to finalise the range of Protected Environmental Values for the surface waters of your regional waterways. These values will also be shown in management plans for the region.

Information from community stakeholders, catchment groups and the public on water quantity values will be utilised 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.

FLINDERS MUNICIPAL AREA CATCHMENTS OVERVIEW

2.1 Furneaux Group

This document covers all of the Islands within the Flinders Municipal Area. This catchment background, however, mainly focuses on the Furneaux Group along with a small amount of information on the Kent and Hogan Groups as little information is available for the smaller outer Islands.

The Furneaux group of Islands is located off the North East tip of Tasmania in Bass Strait. The Furneaux group of Islands consists of over 50 islands which once constituted a land bridge that linked Tasmania to mainland Australia. The largest Island is Flinders Island at 1,333 km², then Cape Barren Island at 445 km², and Clarke Island 82 km². Many of the smaller islands are used for animal grazing and are accessible by boat by local residents with navigational knowledge of the channels. Flinders Island is accessible by both boat and air, as are some of the other smaller islands. The Furneaux Group of Islands makes up the greater part of the Flinders Municipal Area. The current population of the Islands is less than 1000 people. 1996 bureau of statistics data has the Flinders Island population at 924¹.

2.1.1 Climate and Geology

The climate of the Islands is influenced by the surrounding seas which act to moderate the temperature. Climate data is only collected for Flinders Island. The mean daily maximums for Flinders Island are 22.7°C in February and 13.2°C for July and minimum temperatures range from 6.2°C in July

to 13.6°C in February². The average annual rainfall for the region is about 760 mm per year. The wettest months are between May and August with those months experiencing rainfall between 73.4 and 85.9mm. The climate on the Islands is subject to the “Roaring Forties” which are strong prevailing westerly winds.

The geology of the Islands is dominated by granite which occupies about a third of the Islands area, including the striking features of the southern part of Strzelecki Range, Darling Range, The Patriarchs and the higher parts of Cape Barren Island such as Mount Munro and Mount Kerford. About half of the Islands area is coastal sand dunes and related soil deposits. On Flinders Island there is a broad eastern coastal plain and a narrow western coastal plain, which are composed of Cainozoic sediments, sands, grits and clays. The Furneaux Group has geological and geomorphological features which are unique and are outlined in the Furneaux Natural Resource Management Strategy³.

The variation in rainfall, altitude, geology and landform has lead to considerable variety in the soil and vegetation types found on the islands. Nineteen different soil types have been reported by Dimmock to occur on Flinders Island⁴. Deep calcareous sandy soils occur along the coastal dunes and narrow flats and mostly

² Data from the Bureau of Meteorology website: www.bom.gov.au/climate

³ Bayley, S, 1999. Furneaux Natural Resource Management Strategy. Natural Heritage Trust.

⁴ Dimmock, G.M. 1957. Soils of Flinders Island, Tasmania. Soil and Land Use Series, Division of Soils, CSIRO.

¹ Data from the Australian Bureau of Statistics website: www.abs.gov.au

support scrub vegetation with some shrub land, woodland and low forest. The undulating plains such as those found on the western side of Flinders Island and Cape Barren Island have deep, mostly sand and duplex soils which generally support some forests but mainly eucalypt woodlands and scrub vegetation. Woodland vegetation and peppermint eucalypt forests mainly dominate the granite based slopes of the Islands. Vegetation on the smaller islands is dominated by tussock grasslands and coastal heathland.

2.1.2 Flora and Fauna

The flora of the Furneaux Group is regarded as a major asset. The region is biogeographically significant as it is the southern most limit of some mainland Australian species and the northern most limit of some Tasmanian endemic species.

The Furneaux Islands are renowned for the diversity of wildlife and in particular the many bird species. There are 19 species of native mammals on the islands. Evidence suggests that some mainland Tasmanian species have become extinct on the Island such as the Tasmanian devil, eastern barred bandicoots, forester kangaroo and other species. Over 150 bird species have been recorded in the Furneaux group with 11 species being Tasmanian endemic. The lagoons on the east coast of Flinders Island are areas of significant habitat for waders and waterfowl. Logan Lagoon and the eastern Cape Barren Island wetlands are listed as RAMSAR sites, which are wetlands of international significance.

2.1.3 Employment and Industry

Agriculture is the main employment sector for the Island and is a major component of the local economy. Many of the local businesses rely on the

agricultural sector to maintain their viability. The main agricultural products are wool, lamb, beef and live cattle. Flinders Island was once home to a thriving fishing industry, however this activity has declined over recent decades. Abalone fishing however, has become very common. Other fishing activities on the Islands are rock lobster, scallops, shark, and fish species. Lady Barron is home to an abalone hatchery and packing operation and the main fishing ports are at Lady Barron and Killiecrankie.

A Marine Farming Development Plan has been produced for the Furneaux Island Group. The plan identifies areas of coastal waters which may be suitable for marine farming. The plan identifies 18 areas as being suitable for zoning for the purposes of marine farming.⁵ All marine farming activities on the Islands would be confined to those regions unless given authorisation under the *Marine Farming Act 1995* or *Living Marine Resources Management Act 1995*. Some of the proposed zones cover areas of existing farms and others are recognised as being suitable for the expansion of the industry. Sixteen of the eighteen areas covered in the plan are new areas designated for future marine farming development. Marine farming could increase from the current 92 hectares to 738 hectares.

The Island also has a small seasonal tourism industry, centred on Flinders Island. It is estimated that approximately 7,000 people visit Flinders Island each year and it is recognised that there is the potential for growth in this sector. The natural assets of the Island are the biggest draw card for tourists. Flinders Island has many

⁵ 1999. Marine Farming Development Plan – Furneaux Islands. Food, Agriculture and Fisheries Division, Department of Primary Industries, Water and Environment.

superb beaches that could be marketed in terms of tourism. Some camping sites have been developed by Parks and Wildlife at Trousers Point and Allports beach, other basic camping is allowed on Crown Land areas.

2.1.4 Conservation and Heritage

Flinders Island has several areas reserved under the *National Parks and Wildlife Act 1970*, the Wingaroo Nature Reserve, Strzelecki National Park, Logan Lagoon Conservation Area and North East River Game Reserve. Strzelecki National Park covers an area of 4,215 hectares and is located to the south west end of Flinders Island. This park protects highly significant and diverse ecosystems as well as spectacular coastal and mountain landscapes. Wingaroo Nature Reserves covers 9,144 hectares and is located at the northern end of Flinders Island. This reserve protects an extensive area of endangered heathland, valuable wetlands, estuarine marshes and relict Oyster Bay Pine *Callitris rhomboidea* scrub-woodland communities that are of considerable conservation significance. The North East River Game Reserve, on the north-east tip of Flinders Island, covers 2,405 hectares and is reserved for the diversity of plant communities including endangered heath lands, wetlands, estuarine marshes and relict *C. rhomboidea* scrub-woodland. Logan Lagoon Conservation Area is a RAMSAR listed site and covers 75 km². It is protected as it is a near natural wetland and provides feeding and resting habitat for a number of migratory waders. Protected Environmental Values have already been set for Strzelecki National Park, North East River Game Reserve, Wingaroo Nature Reserve and for Logan Lagoon Conservation Area.

The region has 14 wetlands listed on the Directory of Important Wetlands in

Australia as well as the two RAMSAR wetlands⁶.

The islands are significant in terms of cultural heritage particularly with respect to aboriginal heritage. Many aboriginal sites with stone tools, artefacts and shell middens have been found within the Furneaux Island group. A total of 41 Aboriginal sites and 8 potential sites have been recorded on Flinders Island.⁷ The Islands are also recognised for the number of ship wrecks which have occurred throughout the Island group with over 120 shipwrecks having occurred. Other historic features of the Island are light houses and areas that have been established for mining and birding activities.

2.2 Water Quality

Due to the low rainfall and relatively small size of the catchments in the Furneaux Group the flow of rivers, creeks and streams is very seasonal. There are very few permanently running streams on the Islands. The main water courses on Flinders Island are Pats River, North East River, Sapphire River and smaller streams running from the Strzelecki Peaks, Darling Range and Mt Tanner. The major water bodies of Cape Barren Island are Modder River, Lee River and Rices River with many smaller streams and rivers running from the peaks to the coast. Clarke Island has two major waterways Thomas Creek and Maclaines Creek.

⁶ Data from the Directory of Important Wetlands in Australia website:
www.environment.gov.au/wetlands/wet2.html

⁷ Bayley, S, 1999. Furneaux Natural Resource Management Strategy. Natural Heritage Trust.

2.2.1 Drainage Schemes

A notable water feature on Flinders Island is the two drainage systems that have been constructed. The Furneaux drainage scheme is an actively managed scheme. This drainage scheme covers 39,000 hectares and most of this area is considered prime agricultural land. The Commonwealth Closer Settlement Board under the War Service Soldier Settlement Scheme constructed the drainage schemes in the 1950's and 1960's⁸. This scheme drains into four main areas; Foochow, Middle and Patriarchs Inlets and the southern half of the scheme to Cameron Inlet.

The Bootjack drainage scheme drains 10,000 hectares and drains to Logan Lagoon and Adelaide Bay. The quality of water in these drains is of importance as many of the areas on the eastern side of Flinders Island are sensitive and important conservation areas. Logan Lagoon is a RAMSAR site and the other areas have been given Class B conservation status under the Tasmanian Classification of Estuaries⁹. Some of the problems associated with these drainage systems are bank erosion, siltation and sedimentation due to stock access.

2.2.2 Town Water Supply

The three largest towns on Flinders Island and the main township on Cape Barren Island have Town Water Supplies. Whitemark's water supply is sourced from an instream reservoir on

Pats River. Water supplies for Killiecrankie and Cape Barren Island are derived from catchment dams. The Killiecrankie water supply is not suitable for human consumption. Lady Barron's water supply is from an underground aquifer. Flinders Island Council has control over the Whitemark and Lady Barron supplies.

2.2.3 Water Quality Issues

The most common causes of declining water quality for inland surface waters and the wetlands are erosion of water courses, salinity, impacts of fire, land clearance, water extractions for consumptive uses, agricultural pressures and impacts of wastewater. It has been highlighted in the Furneaux Natural resource management strategy that protection of riparian vegetation is important due to its role in maintaining water quality and river health¹⁰. There are many sections of waterways that have had all of the riparian vegetation removed and hence the water quality can become degraded. Roadside practices are also an area identified as impacting on catchment water quality. Pollutants and sediments from road runoff have the potential to enter the rivers and groundwater aquifers.

The management of waste is an important issue in maintaining the long term quality of the natural environment in the region. There are four tip sites on Flinders Island and one on Cape Barren Island. These sites need to be better managed as they are potential sources of pollutants to rivers and streams.

Very little water quality information has been collected for the rivers and streams in the Furneaux Group making it

⁸ Giblin, M., 1996. Furneaux Drainage Area: Options for Local Ownership. Report to the Furneaux Group.

⁹ 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

¹⁰ Bayley, S, 1999. Furneaux Natural Resource Management Strategy. Natural Heritage Trust.

difficult to determine a baseline of water quality however the Furneaux Natural Resource Management Plan identifies that water needs to be better managed.

2.3 Furneaux Estuarine Waters

The Furneaux Group is also important for its coastal, estuarine and marine environments. There are a number of factors that can impact on these environments such as: stormwater runoff, agricultural runoff, septic tank effluent, marine debris and other forms of wastewater discharge.

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 on Flinders Island.¹¹ Results are summarised below. In determining the classification of Tasmanian estuaries the report acknowledged that there were limits to the information available for assessment of the different types of estuaries.

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 five classes:

Classification of Tasmanian estuaries:

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. North East Inlet and Thirsty Lagoon were considered as Class A estuaries.

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. The following estuaries listed by geographical region were recognised as being of high conservation significance: Rocky Head, Sellars Lagoon, Logan Lagoon, Cameron Inlet, The Mines, Middle Inlet, Shag Rock, Modder, Foochow Inlet, Dover, Lee, Rices, and Patriarch.

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. Pats Estuary was identified as having moderate conservation significance.

¹¹ 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

No Class D or Class E estuaries which are degraded or badly degraded were identified for the area.

2.4 Kent Group

The Kent group of islands consists of Judgement Rocks (0.39ha), South West Isle (19.09ha), Deal Island (1576.75), Erith Island (323.19ha), Dover Island (295.02 ha) and North East Isle (32.62ha). This group of islands have recently been designated as National Park under the *National Parks and Wildlife Act, 1970*. Most of these islands are uninhabited by humans but have distinctive bird populations and maybe visited by seals.

Erith Island has been highly modified in the process of improvement for cattle grazing and has largely degenerated to a paddock with sparse natural vegetation and patches of soil erosion. There is now no grazing on the island as it is hoped that the islands native vegetation will regenerate. There are signs of human habitation on the island with a house, grave yard, dams, fences and cattle yards in evidence on the island. Deal Island is also an island with a highly modified landscape, it has a lighthouse, airstrip, roads, jetty, four houses, dams and a museum.¹² This is a highly modified island, with very little of its natural environment intact due to fire, land clearing and grazing.

2.5 Hogan Group

The main islands of the Hogan Group are Twin Islets (5.61ha), Long Island

(22.85), Round Island (3.95ha), East Island (12.42ha) and Hogan Island (232.27 ha).

The largest Island of this group, Hogan Island, is an elongated island running north to south with a highly modified natural environment. 80% of the island is grassland with little soil and a lot of bare granite slabs.¹³ The islands natural vegetation and springs were damaged by uncontrolled livestock grazing. The Twin Islets are steep sided granite islands. Both the north and the south Islets are relatively undisturbed. Long Island also makes up part of the Hogan Group and is a long an narrow island which is largely bare rock. The soil on this island is soft black and sandy and is worthy of further investigation. This island is also an undisturbed island.

Round Island as its name suggests is a round island with slabs of granite forming cliffs which slope from the water on the eastern and northern sides. This is a small island with a representative diversity of seabirds and skinks and is a refuge within the Hogan Group. East Island also makes up part of the Hogan Group. Half of this island is bare granite with little soil cover, the remainder of the island has a sparse amount of soil cover with *poa* species being the dominant vegetation type. The majority of these islands are currently dedicated as unallocated crown land.

¹² Brothers, N, et.al. 2001. Tasmania's Offshore Islands: seabirds and other natural features. Tasmanian Museum and Art Gallery.

¹³ Brothers, N, et.al. 2001. Tasmania's Offshore Islands: seabirds and other natural features. Tasmanian Museum and Art Gallery.

3 WATER QUALITY : THE STATE POLICY ON WATER QUALITY MANAGEMENT

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)** for the surface waters in each region. **PEVs are the current values and uses of a water body for which water quality 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. More than one PEV may be applied to a 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

The Board of Environmental Management and Pollution Control will then specify a range of 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 PEVs to be protected.

The Policy also 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 nearly 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 water quality
- (ii) Secondary contact water quality
- (iii) Aesthetics water quality

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

- (ii) Subject to coarse screening and disinfection.

Under the current *Policy* this PEV applies to water used at 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 disinfected/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 that had been suggested as a starting point and which may have been suitable for surface waters of the region.

These PEVs were developed into the final PEVs as shown in Section 4 and relate to the attached land tenure map for the region.

We wanted the community to tell us about specific areas of your 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)? Other questions were whether existing values and uses are under threat from deteriorating water quality.

The Board and the regional planning authorities considered and took account of all submissions before coming to a decision on PEVs for these wetlands and waterways.

4 WATER QUALITY : PROTECTED ENVIRONMENTAL VALUES FOR THE FLINDERS MUNICIPAL AREA CATCHMENTS

In 2002 the Board of Environmental Management & Pollution Control, in association with the Director of Tasmanian Parks & Wildlife Service and Flinders Council, set Protected Environmental Values for the surface waters of the Flinders Municipal Area, as required by the *State Policy on Water Quality Management 1997*.

The public discussion paper – *Proposed Environmental Management Goals for Tasmanian Surface Waters: Flinders Municipal Area* – was developed by the Department of Primary Industries, Water & Environment, local government and Parks officers, and approved for release to stakeholders and the general community by the Board, the Parks & Wildlife Service and Flinders Council last year. This paper explained the Policy and how the environmental values for water quality (PEVs) are identified and used.

The Discussion Paper was circulated amongst agencies and organisations having an interest in surface waters in the region. The identified stakeholders (149 people) and community were invited to participate in regional water values workshops on Cape Barren Island (25/10/2001) and Flinders Island

(25/10/2001). The meetings were advertised inviting the general public to have input into the PEV setting process. The meetings were advertised in the *Island News* (27/9/2001 and 12/10/2001) and 20 people participated in the process. The local school also requested we attain values from the children and subsequently two class room educational visits were conducted. The meetings were followed by an extended comment period until (23/11/01). 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 and comment was invited on these changes until January 31 2002.

Information collected during the community consultation with regard to water quality was incorporated and reflected in the setting of the Protected Environmental Values. Other community water values will be incorporated into the future development of water management and catchment management plans.

PROTECTED ENVIRONMENTAL VALUES FOR THE FLINDERS MUNICIPAL AREA

The Board, in association with Flinders Island Council the Director of Parks and Wildlife and after a public consultation process has finalised the water quality Protected Environmental Values (PEVs) that are suitable for surface waters of Flinders Municipal Area. The PEVs (drawn from the *State Policy on Water Quality Management*) for surface waters within the Flinders Municipal Area, are shown under the land tenure categories in Table 1 and Map 1.

Remember - the Protected Environmental Values chosen from the Policy are those values and uses which are currently in evidence.

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 1: Protected Environmental Values (PEVs)for the Flinders Municipal Area	
Land Tenure	Protected Environmental Values (*see note on page 21)

Table 1: Protected Environmental Values (PEVs)for the Flinders Municipal Area

Land Tenure	Protected Environmental Values <small>(*see note on page 21)</small>
<p>Surface Waters flowing through Private Land</p> <p>(including forest on private land)</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems <ul style="list-style-type: none"> a. from which edible fish are harvested <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (Rooks River, North East River, Patriarchs Inlet, Pats River at the mouth, Samphire River at the mouth) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>C: Raw Water for Drinking Water Supply (Pats River offtake, Pats River Storage Dam and between the offtake and the Dam and Cape Barren Island Offtake)</p> <ul style="list-style-type: none"> (ii) Subject to coarse screening plus disinfection <p>D: Agricultural Water Uses</p> <ul style="list-style-type: none"> (i) Irrigation (ii) Stock watering <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; that is acceptable for town drinking water at the Pats River offtake, Pats River Storage Dam and between the offtake and the dam (subject to coarse screening plus disinfection); that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in primary contact recreation activities such as swimming at Rooks River, North East River, Patriarchs Inlet, Pats River at the mouth, Samphire River at the mouth and secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>

Table 1: Protected Environmental Values (PEVs)for the Flinders Municipal Area

Land Tenure	Protected Environmental Values <small>(*see note on page 21)</small>
Surface Waters flowing through Aboriginal Land	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems <ul style="list-style-type: none"> b. from which edible fish are harvested <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (j) Primary contact water quality (Rooks River) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>C: Raw Water for Drinking Water Supply (Cape Barren Island Offtake)</p> <ul style="list-style-type: none"> (ii) Subject to coarse screening plus disinfection <p>D: Agricultural Water Uses</p> <ul style="list-style-type: none"> (i) Irrigation (ii) Stock watering <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; that is acceptable for town drinking water at the Cape Barren offtake (subject to coarse screening plus disinfection); that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in primary contact recreation activities such as swimming at Rooks River and secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>

Table 1: Protected Environmental Values (PEVs)for the Flinders Municipal Area

Land Tenure	Protected Environmental Values ^(*see note on page 21)
<p>Surface Waters flowing through Forest Reserves from Unallocated Crown Land, State Forest and Private Land.</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems <ul style="list-style-type: none"> a. From which edible fish are harvested <p>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 & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface waters with their headwaters within Forest Reserves.</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of pristine or nearly pristine ecosystems <p>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 & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek 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 (where permitted), paddling or fishing in aesthetically pleasing waters.</p>

Table 1: Protected Environmental Values (PEVs)for the Flinders Municipal Area

Land Tenure	Protected Environmental Values ^(*see note on page 21)
<p>Surface Waters flowing through National Parks, State Reserves, Nature Reserves or Historic Sites from Private Land, State Forest or Unallocated Crown Land</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of a modified (not pristine) ecosystems <ul style="list-style-type: none"> a. from which edible fish are harvested <p>having regard for the management objectives for national parks, State reserves, nature reserves or historic sites as outlined in Schedule 4 of the <i>National Parks and Wildlife Act, 1970</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified ecosystem from which edible fish may be harvested, and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface Waters with their headwaters within National Parks, State Reserves, Nature Reserves or Historic Sites.</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of pristine or nearly pristine ecosystems <p>having regard for the management objectives for national parks, State reserves, nature reserves or historic sites as outlined in Schedule 4 of the <i>National Parks and Wildlife Act, 1970</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or nearly pristine ecosystem; and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>

Table 1: Protected Environmental Values (PEVs)for the Flinders Municipal Area

Land Tenure	Protected Environmental Values ^(*see note on page 21)
<p>Surface Waters flowing through Nature Recreation Areas, Conservation Area, Regional Reserves or Game Reserves from Private Land, State Forest or Unallocated Crown Land</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of a modified (not pristine) ecosystem <ul style="list-style-type: none"> a. from which edible fish are harvested <p>having regard for the management objectives for nature recreation areas, conservation areas, regional reserves or game reserve as outlined in Schedule 4 of the <i>National Parks and Wildlife Act, 1970</i></p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified ecosystem from which edible fish maybe harvested, and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface Waters with their headwaters within Nature Recreation Areas, Conservation Areas, Regional Reserves or Game Reserves, or flowing through Nature Recreation Areas, Conservation Areas, Regional Reserves or Game Reserves from adjacent headwaters in National Parks.</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Protection of Pristine or nearly pristine ecosystems <p>having regard for the management objectives for nature recreation areas, conservation areas, regional reserves or game reserve as outlined in Schedule 4 of the <i>National Parks and Wildlife Act, 1970</i></p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek 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 (where permitted), paddling or fishing in aesthetically pleasing waters.</p>

Table 1: Protected Environmental Values (PEVs)for the Flinders Municipal Area

Land Tenure	Protected Environmental Values ^(*see note on page 21)
<p>Surface Water flowing through State Forest</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems <ul style="list-style-type: none"> a. From which edible fish are harvested <p>having regard for the management objectives outlined in Schedule 3 of the <i>Forestry Act, 1920</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; and which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface waters flowing through Public Reserves under the <i>Crown Lands Act 1976</i></p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems <ul style="list-style-type: none"> a. from which edible fish are harvested <p>having regard for the management objectives for public reserves outlined in Schedule 4 of the <i>Regional Forest Agreement (Land Classification) Act, 1998</i></p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish are harvested; which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling or fishing in aesthetically pleasing waters.</p>

Table 1: Protected Environmental Values (PEVs)for the Flinders Municipal Area

Land Tenure	Protected Environmental Values ^(*see note on page 21)
<p>Surface waters flowing through Unallocated Crown Land</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems <ul style="list-style-type: none"> a. from which edible fish are harvested <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support modified, but healthy aquatic ecosystems from which edible fish may be harvested; which will allow people to safely engage in recreation activities such as swimming (where permitted), paddling and fishing in aesthetically pleasing waters.</p>
<p>All Estuarine Surface Waters</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems from which edible fish, shellfish and crustacea are harvested <p>B: Recreational Water Quality and Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (ii) Secondary contact water quality (iii) Aesthetic water quality <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 crustacea may be harvested; which allows people to safely engage in activities such as swimming, boating or fishing in aesthetically pleasing waters.</p>

* 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 State Policy on Water Quality Management, 1997.

5 WATER QUANTITY VALUES FOR THE FLINDERS MUNICIPAL AREA CATCHMENTS

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 proposes 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 (Water Management Act 1999). 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 there may need to be trade-offs needed 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 also 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 Protected Environmental Values, 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;

From the public's input, specific water management objectives can be developed for the catchment, and incorporated into a regional or catchment-based water management plan.

In most cases, the government will weigh up the identified objectives with any available scientific data. Additional data may need to be obtained, and economic analyses done to determine what impact attempting to protect all the identified values may have. It is possible that, in some cases, there may simply not be enough water to go around, and a trade-off in values may then be necessary.

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 artificial erosion whilst maintaining where appropriate natural processes of erosion and deposition;
- 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 quantity.

6 Community Water Values Flinders Island Municipal Area

Cape Barren Island Meeting Community Water Values 25 October 2001

Consumptive/Non Consumptive	<ul style="list-style-type: none"> • Maintain water quality for the Town Water Supply on Cape Barren Island.
Recreational/Aesthetic	<ul style="list-style-type: none"> • Maintain water quality at a level suitable to support swimming throughout Cape Barren Island but particularly on Rooks River. Most rivers on Cape Barren Island do not contain enough water to sustain recreational activities. • Maintain water quality at a level suitable to support fishing on the following waterways: <ul style="list-style-type: none"> ❖ Modder River ❖ Lee River (Deep Bay) ❖ Rices River (Kents Bay) ❖ Little River ❖ Battery Creek. • Maintain water quality in Rooks River to support the collection of coloured stones. • Maintain water quality at Corner Creek for paddling and the collection of watercress. • Maintain water quality to support camping alongside waterways. • Maintain water quality and aesthetics to allow for walking along river banks. • Maintain water quantity in order to maintain the aesthetic value of the waterfalls. • Maintain the aesthetic values of Rooks River.
Ecosystem / Basic River Health	<ul style="list-style-type: none"> • Maintain the intact natural landscape values of Cape Barren Island. • Maintenance of vegetation on stream banks to prevent erosion. • Maintain water quality suitable to support trout populations in most streams. • Maintain water quality at a level suitable to support eel populations. • Maintain water quality to support birdlife including swans, ducks, native hens and chickens. • Maintain water quality in Battery Lagoon to support the many frog species inhabiting this area.
Other Values/Issues	<ul style="list-style-type: none"> • Maintain the cultural values of all the creeks and rivers on the Island. • Maintain ability to be able to collect shells from waterway. • Would support some low key nature based activity on the Island. • Should protect creeks from being dammed as this destroys the creeks. • General concern about the decline in fish populations in costal areas. • Although there is a desire to maintain the town water supply most people use tank water as they do not like the colouration (tannins) of the Town Water. There is a general concern since the dam has been put in that water is not flowing down Corner Creek and where once traditional water cress was collected this can no longer occur as there is no water flowing out of the dam to sustain the water cress. • The low population and lack of industry allows Cape Barren Islands waterways to remain in a pristine condition.

Flinders Island Meeting Community Water Values 25 October 2001

<p>Consumptive/ Non Consumptive</p>	<ul style="list-style-type: none"> • Maintain water quality suitable for irrigation throughout the Island groups when the resource is available. • Maintain water quality in the Samphire River Dam so it is suitable for irrigation. • Maintain water quality throughout the Furneaux group so that it is suitable for stock watering, particularly in Pickford and Eden’s Creek. • Maintain water quality on Pats River and Pats River Dam so it is suitable for town water supply. • Maintain water quality so that it is suitable for homestead use when water is available in all creeks and rivers. • Maintain water quality of Killiecrankie River for non-potable homestead uses. • Maintain water quality on Pats River for private homestead usage. • Maintain water quality on the outer islands for household uses such as washing.
<p>Recreational/ Aesthetic</p>	<ul style="list-style-type: none"> • Maintain water quality at a level that is suitable to support swimming at the following locations: <ul style="list-style-type: none"> ❖ North East River ❖ Patriarch Inlet ❖ Pats River – Swimming at the mouth of the River ❖ Samphire River at the mouth. • Maintain water quality at a level suitable to support fishing at the following locations: <ul style="list-style-type: none"> ❖ North East River ❖ Samphire River ❖ All East Coast Lagoons (fish stock not always suitable for fishing) ❖ Patriarch River and Lagoon ❖ Long Point Estuary ❖ All east coast estuaries.. • Maintain water quality at a level suitable for paddling and wading on the Samphire River and in the East Coast Lagoons. • Maintain water quality to support secondary contact activities such as boating and kayaking on the North East River and East Coast Lagoons. • Maintain water quality to support bird populations to enable bird watching on North East River, Samphire River, East Coast Lagoons of Flinders Island, Patriarch Lagoon and Long Point Estuary. • Maintain water quality in Edens Creek and North East River to support bird populations for the purposes of shooting. • Maintain the aesthetics of Cape Barren Island Lagoons.

**Ecosystem / Basic
River Health**

- Maintain water quality in Reedy Lagoon on the NW side of Flinders Island to preserve rare species of microflora endemic to Tasmania (as reported by P. A. Tyler for the National Estate Grants Program 9111)
- Maintain the native values of North East River as it is free of forestry and doesn't have a lot of farming occurring in the catchment.
- Maintain the water quality of the Patriarchs River to support the native pigmy perch (only location this species has been discovered on the Island so far) and mountain trout.
- Maintain the water quality on Big River to support galaxiids and other fish species.
- Maintain water quality in Edens Creek to support galaxiids.
- Maintain water quality on Wallanippi Creek to support galaxiid populations.
- Maintain water quality of the Samphire River to support galaxiid and mullet populations.
- Maintain water quality in Modder River to support galaxiid populations.
- Maintain water quality in Rooks River to support galaxiid populations.
- Maintain water quality of Cronleys Creek to support galaxiid populations.
- Maintain water quality in Joes Creek (arises in the National Park) to support galaxiid populations.
- Maintain water quality in all streams to support eel and native yabbie populations.
- Maintain water quality in Bowmans Creek and Chowback Creek to support eel, fish and birdlife.
- Maintain water quality of the waterways in the Strezlecki National Park to support the burrowing crayfish.
- Maintain water quality in all the estuaries to support native crab species.
- Maintain the water quality and water flows in the ephemeral lagoons to sustain healthy frog populations particularly the green and gold tree frog.
- Maintain the water quality of all waterways but particularly the lagoons and estuaries to support waterbirds.
- Maintain water quality of the east coast of Flinders Island, as it is part of the migratory bird path where at least 140 species of bird can reside.
- Maintain water quality and on Samphire River to support a wide variety of fish and bird species.
- Maintain sufficient water quality and quantity to support the wetlands on the east side of Flinders Island.
- Maintain water quality in the east coast wetlands.
- Maintain water flows into conservation areas to support bird species and to maintain the tourist value of the area.
- Maintain the natural condition of streams as not all streams run all year. Many of the rivers also disappear underground which is a natural phenomenon, which should be maintained.
- Maintain the natural water flows in the wetlands as drought and flood conditions are a natural part of these systems.
- Maintain areas free of unnatural erosion and maintain native riparian vegetation on the Samphire River for river health and as bird nesting areas.
- Maintain areas of the Samphire River that are free of weeds.
- Manage the prevalence of pampas grass near streams as this is a prolific weed.
- Maintain areas free of unnatural erosion by protecting intact riparian zones.
- Maintain water values to support native riparian vegetation around the waterways of Strezlecki National Park and Fotherington Creek.
- Flinders Island as a whole is valued for its biodiversity.

	<ul style="list-style-type: none">• Cape Barren Island lagoons are valued as they are intact ecosystems and should be maintained.
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	<ul style="list-style-type: none"> • Maintain and encourage the fencing of riparian vegetation to prevent stock access. • Maintain the natural values and diversity of vegetation near Officers Creek. • Maintain the value of the melaluca forest near Big, Samphire, Dart and Wallalimpicck Rivers. • Maintain drainage flows off agricultural land to reduce water logging and salinity.
<p>Other Values/Issues</p>	<ul style="list-style-type: none"> • Concern about the threat to game fishing on North East River from refuelling of boats in this area. Concern if there is a move in the future to covert land to plantation forestry and the impacts this will have on the ecosystem. • Concern that there is a general lack of knowledge with respect to water quantity on Flinders Island, particularly with respect to groundwater which is where the majority of the water is sourced. • Maintain sufficient water quality and quantity to support the wetlands on the east side of Flinders Island by directing water to other wetlands rather than opening Cameron’s inlet. • Maintain the naturalness of the east coast wetlands and ensure they are not further modified by the transfer of more water to them than is provided for by the natural contours of the land. • Potential for water flows from Cameron’s Inlet to be transferred up to Sellars Lagoon or Chain Lagoons to allow a larger habitat for water birds over a longer period of time. • Maintain Cameron’s Inlet to the extent that it does not back up water on to the agricultural land. • General concern about acid sulphate soils and their interaction with water quality and what impacts this could potentially have. • There is a general potential for salinity in both the groundwater and surface waters through rainfall inputs in to the system. • Phytophthora cinnamoni is widespread throughout the Furneaux group where it causes disease in heathland plants. It can spread in the water as microscopic spores and hence changes to the drainage networks on the Island should be considered carefully as this could shift infected waters into the drainage channels and infect other susceptible vegetation. • Maintain the historical and cultural values associated around the waterways of the Furneaux Group. Some of the historic values are listed below: <ul style="list-style-type: none"> ❖ Historic tin mining at Mines Creek which is now used for the collection of Killiecrankie Diamonds. ❖ Maintain the historic values of Nautilus Cove, as it is the site of the settlement of the first sealers. ❖ Maintain historic values of tin mining at Youngs Creek and Officers Creek. ❖ Apple Orchard Point on Cape Barren Island should be preserved for its historical and cultural significance. ❖ Maintain historical and cultural values of Preservation Island and Rum Island as these were discovered from Sydney and were first settled in 1797. ❖ Maintain the values of Clarke Island. There are 7-8 permanent residents on the Island. ❖ Maintain historic and cultural values of Wyabalena as the first site of settlement on Flinders Island.

Flinders Island School Children's Water Values 26 October 2001

Consumptive/ Non Consumptive	<ul style="list-style-type: none"> • Maintain water quality suitable for drinking on Pats River.
Recreational/ Aesthetic	<ul style="list-style-type: none"> • Maintain water quality at a level that is suitable to support swimming on North East River, Pats River and at all beaches.
Ecosystem / Basic River Health	<ul style="list-style-type: none"> • Maintain areas of streams that are fenced to protect the vegetation and water quality. • Control duck and shag populations on waterways as they stir up the water. • Maintain water quality at a level suitable to support fish species. • Maintain water quality in all waterways to support pelicans, sea eagles and wedgetailed eagles.