

PROTECTED ENVIRONMENTAL VALUES FOR THE DERWENT ESTUARY

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1 Background

In 1997, the State Government of Tasmania enacted new legislation to manage water quality in all waters of the State. The *Tasmanian Water Quality Management Policy 1997* (the Policy) was modelled on the national framework, and has at its core the setting of Protected Environmental Values (PEVs) for all waters of the State. These PEVs are based on existing environmental values and human uses, and are in the process of being set throughout the State. PEVs will form an important basis for on-going management and are clearly of great relevance to the Derwent Estuary Program (DEP). PEVs will eventually be linked with related water quality objectives or guidelines. These guidelines will define the water quality standards which should be met in order to protect an environmental value.

An important objective of the DEP – as clearly indicated in the work plan - is to facilitate the implementation of the State Water Quality Management Policy for the Derwent Estuary. Therefore, it was proposed that PEVs would be drafted through a consultative process with stakeholders and the community. These draft PEVs will then be referred to EMPCA for their consideration/action and included in Council planning schemes, if required.

An overview of the Policy is provided below, together with a discussion of how this will be integrated within the DEP. The methodology used in drafting the PEVs and the final PEVs for the Derwent Estuary are presented in subsequent sections.

2 Tasmania's State Policy on Water Quality Management

Tasmania's Policy on Water Quality Management was adopted in September of 1997. The Policy's objective is to protect and enhance water quality while allowing for sustainable development. In a change from previous legislation, which focused on regulating end-of-pipe discharges, the Policy focuses on protecting/enhancing ambient water quality in rivers, water bodies and coastal waters.

The degree of required protection is based on the values and uses of the environment for which it has been determined that a given water body should be protected. These values and uses are termed Protected Environmental Values (PEVs).

Protected Environmental Values

The PEVs listed in the Policy are as follows:

- A. Protection of Aquatic Ecosystems
 - (i) *Protection of pristine or nearly pristine ecosystems*
 - (ii) *Protection of modified ecosystems*
 - (a) *from which edible fish, crustacea and shellfish are harvested*
 - (b) *from which edible fish, crustacea and shellfish are not harvested*

- B. Recreational Water Quality and Aesthetics
 - (i) *Primary contact water quality*
 - (ii) *Secondary contact water quality*
 - (iii) *Aesthetic water quality*

- C. Raw Water for Drinking Water Supply
 - (i) *subject to coarse screening only*
 - (ii) *subject to coarse screening plus disinfection*

- D. Agricultural Water Uses
 - (i) *irrigation*
 - (ii) *stock watering*

- E. Industrial Water Supply
(*specify industry*)

Of these, only A, B and E are relevant to saline, estuarine waters.

The Policy also indicates that:

- PEVs are to be designated and reviewed through a catchment-based consultative process
- PEVs are intended to reflect the community's current uses and values for the water resource, and do not specifically address future desires or objectives.
- PEVs are normally linked with maps, and may include references to unique habitats, species, uses or other features (e.g. conservation areas, reserves) which occur within the identified area(s).

Water Quality Guidelines and Objectives

Water quality guidelines are estimates, based on best scientific information available, of the level of indicators which should be met in order to protect an environmental value. These guidelines are also frequently referred to as water quality indicators or environmental indicators and generally consist of physical, chemical or biological measurements (i.e. numbers) which reflect the environmental condition of a water body. These indicators might include, for example, concentrations of nutrients, chlorophyll a or faecal indicator bacteria measured in water, levels of heavy metals, hydrocarbons or toxic phytoplankton measured in shellfish and so forth.

The Policy states that specific guidelines to protect human health should be those recommended by NH&MRC, and that guidelines to protect other values should be derived predominantly on the basis of site specific information and/or the latest Australian Water Quality Guidelines. Other authoritative and appropriate information may also be used by the Board of Environmental Management (the Board) in setting guidelines.

Water quality objectives (WQOs) for a given body of water are the most stringent set of water quality guidelines that will achieve all of the nominated PEVs for that system. The Policy indicates that the Board is responsible for determining water quality guidelines for key indicators to achieve protected environmental values. These Guidelines and Objective are not required to be shown in planning schemes.

Other relevant issues

The Water Quality Policy identifies a number of issues/tasks/activities – listed below – that are very relevant to the DEP. These include:

- Erosion/stormwater run-off code of practice (COP) to be developed;
- Agricultural COP to be developed;
- Councils to prepare/implement stormwater management plans – assessment of the need for these is required within 3 years of Policy adoption;
- Revision of forestry practices code;
- Road construction, maintenance and drainage best practice/COPs to be developed;
- Disposal of wastes from boats – strategy to be developed/implemented;
- Discharge of ballast water – responsible authorities to prepare Port Management plans within 3 years of Policy adoption;
- The Policy itself is to be reviewed 3 years after its initial adoption and at 5-year intervals thereafter.

3 Integration of the Policy and the Derwent Estuary Program

There are a number of areas in which the Policy and DEP overlap and complement each other. The definition of existing uses and values, the public consultation process and the drafting of PEVs for the Derwent Estuary are clearly identified in Stage 2 of the DEP. Furthermore, there are a number of potentially complimentary parallels between the Water Quality Indicators/Environmental Quality Objectives outlined in the Policy and the environmental indicators/thresholds proposed as part of the DEP.

However, there are some critical differences between the DEP and Policy. The DEP uses the existing uses/values of the Derwent as a starting point (Stage 2), but the ultimate goal of the Program is to develop a shared vision of future uses/values (Stage 3), and then to develop a strategy and implementation program to achieve this vision (Stages 4 and 5).

The Policy focuses primarily on the protection or enhancement of existing values and uses, but does not specifically address the identification or achievement of future goals and objectives. The Policy does however identify a number of measures to be used in achieving the protection/enhancement of water quality. These include limiting emissions from point sources (e.g. via recycling and reuse of wastewater), adoption of best practice environmental management, development of various guidelines and codes of practice, reduction of diffuse sources pollution, etc.

In summary, it is proposed that the DEP and the Policy will essentially run parallel during Stage 2 of the DEP. In Stage 3, however, the DEP will focus on future uses and values and target those indicators and thresholds required to achieve these.

4 Methodology Used in Drafting PEVs for the Derwent

On the basis of discussions with DPIWE's Policy staff and workshops with the DEP Technical Working Group, it was agreed that:

- In setting PEVs, it is appropriate to divide up the estuary into several smaller regions, to better reflect variations in uses and values;
- In writing PEVs, a balance should be maintained between simplicity and inclusion of sufficient site-specific information such that unique values and uses within each region are reflected;
- Where possible, PEVS and related information should be indicated on GIS-based maps;
- Sources of information used in drafting PEVs should be clearly identified.

5 Consultation process

Draft PEVs were initially prepared through a series of workshops with the DEP's Technical Working Group and in close consultation with DPIWE's Policy group. The Derwent Estuary was divided into 4 subregions which reflect differences in human uses and natural conditions (see Figure 2). PEVs were then drafted to reflect the unique uses and ecological features (e.g. habitat types, conservation areas, species of conservation significance, etc.) within each subregion (see Figures 3 through 6). GIS based maps have been developed for each of the 4 subregions and for the Derwent as a whole.

The Discussion Paper – *Draft Protected Environmental Values for the Derwent Estuary* – was developed by the Derwent Estuary Program in association with DPIWE and councils and approved for release to stakeholders and the public in January 2001. This paper explained the Policy and how the environmental values for water quality (PEVs) are identified and used.

The estuary area extends from the New Norfolk Bridge to a line between Tinderbox and the Iron Pot Light. The streams and catchment immediately landward of the estuary were the subject of a separate discussion

paper, however consultation for both sets of PEVs was carried out at the same time. A separate discussion paper and consultation process were completed for the Derwent River, upstream of New Norfolk.

The Discussion Paper was sent to 170 stakeholders who were invited to attend one of three workshops (held Feb-Mar 2001) to discuss proposed Protected Environmental Values for the estuary and catchment and to identify Community Water Values. Stakeholders invited included community groups such as Waterwatch, Landcare and catchment management groups, farmers, industries, Hobart Water and planning authorities. Unfortunately, these workshops were not well attended.

Three public meetings were held three weeks after the stakeholder workshops. These meetings were advertised in the Public Notices section of the Mercury on two consecutive Saturdays. To raise the profile of these meetings a media release was sent out which resulted in an article appearing in 'The Mercury', a radio interview on ABC "Drive Time", a story on WIN TV news and an article in the Derwent Valley Gazette. Attendance at the public meetings was better than at the stakeholder workshops, but it was still low considering the population of the municipalities involved.

The main changes made to the PEVs for the Derwent Estuary resulting from the community consultation were as follows:

- inclusion of several additional habitats and species of conservation significance;
- addition of swimming as an existing recreational use in the middle section of the estuary.

These amendments to the PEVs and the compiled Community Water Values were sent to stakeholders and those who attended the meetings for feedback. No comments requiring further amendments to the PEVs or Community Water Values were received and there appear to be no outstanding issues in relation to identifying the PEVs for the Derwent Estuary.

The Board of Environmental Management and Pollution Control in association with the Brighton, Clarence, Derwent Valley, Glenorchy, Hobart and Kingborough Councils, and the Director of National Parks and Wildlife then endorsed the Protected Environmental Values.

5 Protected Environmental Values for the Derwent

The PEVs for each of the four regions of the Derwent Estuary are detailed in the following pages.

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.

Area 1 - Ralphs Bay

1. Ecological Values

This area of the Derwent Estuary is characterised by relatively high salinities, shallow water depths and sheltered waters. Important estuarine habitat types include mud and sand flats, saline flats, salt marshes, coastal dunes (e.g. South Arm) and wetlands (e.g. Lauderdale) (1). Seagrass meadows may have been formerly abundant in Ralphs Bay, but seem to have vanished over the past 30-40 years (2). Major conservation areas include the South Arm State Recreation Area and South Arm Wildlife Sanctuary. Threatened/protected species found in this area include dolphins, small whales, the salt marsh moths and the spotted handfish (3). Other species of conservation significance include many types of seabirds, particularly waders and shorebirds. Mortimer Bay has been identified as an important breeding area for pied oyster catchers (4).

Finfish are harvested from Ralphs Bay by recreational fishermen, however shellfish harvesting has been prohibited due to high concentrations of heavy metals (1).

2. Recreational Uses

Ralphs Bay is used for both primary and secondary recreation. Windsurfing is popular off Lauderdale and the bay is widely used for recreational boating and fishing, with popular anchorages off Shelly Beach.

On the basis of the values and uses described above, Protected Environmental Values for Ralphs Bay (Area 1 on the attached Figure) are defined as follows:

- A: Protection of Aquatic Ecosystems:
- (ii) Protection of modified (not pristine) ecosystems from which edible fish, but not shellfish or crustacea, are harvested, and having particular regard to the ecological values identified in paragraph 1 above.
- B: Recreational Water Quality and Aesthetics:
- (i) Primary contact water quality
 - (ii) Secondary contact water quality
 - (iii) Aesthetic water quality
- and having particular regard to the recreational uses identified in paragraph 2 above.

SOURCES:

- (1) *Coughanowr, 1997. State of the Derwent Estuary Report,*
- (2) *Rees, 1993. Seagrass Communities. Masters Thesis, Department of Geography and Environmental Studies, University of Tasmania, Hobart.*
- (3) *Bryant and Jackson, 1999. Tasmania's Threatened Fauna Handbook (4) Parks and Wildlife Service, pers comm, 1999*

**Area 2 – Lower Derwent Estuary:
Tasman Bridge to Tinderbox/South Arm**

1. Ecological Values

This area of the Derwent Estuary is characterised by relatively high salinities, intermediate to deep water depths and is well-mixed by winds and currents. Important estuarine habitat types include rocky cliffs, intertidal and subtidal rocky reefs, macroalgae beds, seagrass beds, sandy beaches and coastal dunes (1). Major conservation areas within this area include the Cape Direction Muttonbird Sanctuary, Tinderbox Marine Reserve, Kingston Beach Golf Course Wildlife Sanctuary and Alum Cliffs Recreation Reserve. Threatened/protected species found in this area include whales (southern right, humpback, orca), dolphins, seals, wedge tailed eagles, southeastern seastars and the spotted handfish (2). Other species of conservation significance include giant string kelp, seahorses/sea dragons, threefins and muttonbirds (3).

Finfish are harvested from the lower Derwent by recreational fishermen, however shellfish harvesting has been prohibited due to high concentrations of heavy metals (1). Abalone, crayfish and sea urchins are also harvested from the area, particularly along the western shoreline, south of Tarooma.

2. Recreational Uses

The lower Derwent is used for both primary and secondary recreation. Popular swimming beaches include Howrah Beach and Bellerive Beach, Opossum Bay, Half Moon Bay, Blackmans Bay, Kingston Beach, Tarooma and Long Beach/Sandy Bay. The area is also widely used for recreational boating and fishing. The Tinderbox Marine Reserve and surrounding areas are popular sites for snorkelling and scuba diving.

On the basis of the values and uses described above, Protected Environmental Values for the Lower Derwent (Area 2 on the attached Figure) are defined as follows:

- A: Protection of Aquatic Ecosystems:
- (ii) Protection of modified (not pristine) ecosystems from which edible fish, crustaceans and abalone, but not other shellfish, are harvested, and having particular regard to the ecological values identified in paragraph 1 above.
- B: Recreational Water Quality and Aesthetics:
- (i) Primary contact water quality
 - (ii) Secondary contact water quality
 - (iii) Aesthetic water quality
- and having particular regard to the recreational uses identified in paragraph 2 above.

SOURCES:

- (1) Coughanowr, 1997. *State of the Derwent Estuary Report*,
- (2) Bryant and Jackson, 1999. *Tasmania's Threatened Fauna Handbook*
- (3) Parks and Wildlife Service, pers comm, 1999

**Area 3 - Middle Derwent Estuary:
Tasman Bridge to Bridgewater Causeway**

1. Ecological Values

This region of the Derwent Estuary is considerably narrower than downstream areas, and is partially sheltered from prevailing westerlies. The shoreline is relatively convoluted with numerous embayments (the largest of these is Herdsmans Cove, where the Jordan River joins the estuary). Water depths between the Bowen and Tasman bridges are deep to intermediate, permitting the passage of large ships. Above the Bowen Bridge, however, the channel becomes more well-defined and is bordered by extensive subtidal flats. Salinities in this area are intermediate, and the water column ranges from strongly stratified at the Bridgewater Causeway to partially mixed at the Tasman Bridge (1).

Important estuarine habitat types include numerous bays and coves, rocky promontories, silt/pebble beaches, saline and intertidal flats, salt marshes and seagrass beds. Wetlands were formerly present at the heads of many embayments, but have been largely reclaimed with the exception of a few remnants (e.g. Goulds Lagoon, Risdon Cove) (1). Major conservation areas include the East Risdon Nature Reserve, Green Point Nature Reserve and Goulds Lagoon Wildlife Sanctuary. Threatened/protected species found in this area include dolphins, occasional seals, green and gold frog, and southeast seastars. (2). Goulds Lagoon and Risdon Cove also provide important habitat for a range of waterbirds (3).

Finfish are harvested from the lower Derwent by recreational fishermen, however shellfish harvesting has been prohibited due to high concentrations of heavy metals.

2. Recreational Uses

The middle Derwent is primarily used secondary recreation, particularly small boat sailing, rowing and fishing. Some primary contact uses also occur, such as swimming, water skiing and wind -surfing, and the annual Cross-Derwent Swim occurs near the southern boundary of this area.

3. Industrial water supply

The Pasmenco Hobart zinc smelter at Risdon, extracts approximately 65,000 kL/day of estuarine water from this area for use in the foreshore gas scrubbers.

On the basis of the values and uses described above, Protected Environmental Values for the Middle Derwent (Area 3 on the attached Figure) are defined as follows:

- A: Protection of Aquatic Ecosystems:
 - (ii) Protection of modified (not pristine) ecosystems from which edible fish, but not shellfish or crustaceans, are harvested, and having particular regard to the ecological values identified in paragraph 1 above.

- B: Recreational Water Quality and Aesthetics:
 - (i) Primary contact water quality
 - (ii) Secondary contact water quality
 - (iii) Aesthetic water qualityand having particular regard to the recreational uses identified in paragraph 2 above.

- E. Industrial Water Supply
(Pasmenco Hobart Smelter)

SOURCES:

- (1) *State of the Derwent Estuary Report, 1997*
- (2) *Bryant and Jackson, 1999. Tasmania's Threatened Fauna Handbook*
- (3) *Parks and Wildlife Service, pers comm, 1999*

***Area 4 – Upper Derwent Estuary:
Bridgewater Causeway to New Norfolk Bridge***

1. Ecological values

The upper Derwent Estuary is characterised by a narrow channel bordered by extensive shallow flats and wetlands. The water column is strongly stratified and salty water persists at depth upstream to the New Norfolk Bridge. Important estuarine habitat types include brackish marshes, intertidal mud flats and subtidal seagrass (e.g. *Ruppia*) beds (1). Conservation areas include the Derwent River Wildlife Sanctuary and Derwent Cliffs State Reserve.

Species of conservation significance include many types of waterfowl, waders and other birds. Thousands of ducks and swans make use of the area, particularly in mid-summer, and harriers and other raptors are frequently seen hunting in the marshes. The mudflats and wetlands also serve as critical habitat for many species of fish, amphibians and invertebrates (2). The Tasmanian whitebait and Tasmanian mudfish (important components of the annual whitebait runs) are both known to spawn in the area. The upper Derwent is an important passage for migratory fish. Sea trout, black bream, yellow eye mullet and eel pass through this area in large numbers, as do 6 smaller fish species collectively known as whitebait (3). Threatened/protected species found in this area include coastal migratory waders, Australian grayling (fish), sea eagles and great crested grebes. (4).

Finfish are harvested from the upper Derwent by recreational fishermen, however, shellfish do not colonise this area due to unsuitable salinities.

2. Recreational Uses

The upper Derwent is used for both primary and secondary recreation. The entire area is generally used for rowing, kayaking, canoeing, motorboat racing, water-skiing, and fishing. Swimming is generally restricted to the river around New Norfolk.

4. Industrial water supply

The Norske Skog paper mill at Boyer uses approximately 1000 to 2000 kL/day of estuarine water from this area for washing down and other uses on site.

On the basis of the values and uses described above, Protected Environmental Values for the Upper Derwent (Area 4 on the attached Figure) are defined as follows:

- A: Protection of Aquatic Ecosystems:
 - (ii) Protection of modified (not pristine) ecosystems from which edible fish are harvested, and having particular regard to the ecological values identified in paragraph 1 above.

- B: Recreational Water Quality and Aesthetics:
 - (i) Primary contact water quality
 - (ii) Secondary contact water quality
 - (iii) Aesthetic water qualityand having particular regard to the recreational uses identified in paragraph 2 above.

- E. Industrial Water Supply
(*Norske Skog paper mill*)

SOURCES:

- (1) Coughanowr, 1997. *State of the Derwent Estuary Report*
- (2) Parks and Wildlife Service, pers comm, 1999
- (3) Inland Fisheries Commission, pers. comm, 1999
- (4) Bryant and Jackson, 1999. *Tasmania's Threatened Fauna Handbook*