

REGIONAL NRM STRATEGY DEVELOPMENT
MARINE AND ESTUARINE WATER QUALITY
SOUTHERN REGION

1. Overview of the asset within the Region

The coastal waters of the Southern Region occur within the Davey, Bruny and Freycinet bio-regions. The east and south-eastern coastline is extremely convoluted and, as such, is characterised by a number of relatively shallow and sheltered coastal embayments, such as Great Oyster Bay, Frederick Henry and Norfolk Bays and the D'Entrecasteaux Channel. In contrast, the southern and south-western coastal waters are exposed to the Southern Ocean, which generates some of the largest swell in Australia, although some protection can be found in the protected waters of Bathurst Harbour. Water quality in the south is driven largely by the Southern Ocean, while the coastal waters along the east coast of Tasmania are heavily influenced by the East Australian Current.

A number of different estuary types are found within the Region, due largely to differences in wave energy, rainfall and catchment size. Relatively small estuaries with a sand bar at the mouth are common on the east coast whereas open estuaries and bays with a large marine influence are more common in the south-east. The three largest estuaries within the Region, the Derwent and Huon River estuaries and Bathurst Harbour, are all drowned river valleys. Tannin-stained (tea coloured) waters are characteristic of south and west coast estuaries.

Of the 111 estuaries recognised in Tasmania, 39 occur within the Southern Region. The Derwent estuary and its surrounds are the focus of development for the State capital of Hobart and associated suburbs. Larger population centres such as Sorell (Pitt Water) and Huonville (Huon) are also situated on estuaries. Estuaries within the Region provide port facilities for commercial shipping, such as the Derwent and Spring Bay, while smaller fishing ports exist at Dover (Port Esperance), Southport and Dunalley (Blackman Bay).

A study of Tasmanian estuaries (Edgar *et al.* 1999) determined the conservation significance of each estuary, with the highest conservation significance for each type of estuary generally based on the least human disturbance and the greatest proportion of catchment under statutory protection. Five estuaries in this Region (Bryans Lagoon, Southport Lagoon, New River Lagoon, Bathurst Harbour and Payne Bay) were determined to be of critical conservation significance. A further 9 estuaries are considered to be of high conservation significance, in particular Great Swanport and Cloudy Bay Lagoon. Not surprisingly, most of the estuaries of high conservation significance in the Southern Region are situated within National Parks in the south and west or within Freycinet.

Poor water quality within coastal waters and estuaries can cause a number of problems. Faecal waste can cause a number of human health issues such as infection through direct contact or by eating shellfish. Excess nutrients can cause algal blooms that may adversely affect the ecosystem, cause toxic shellfish poisoning or simply turn waterways into an unattractive green mess. Increased siltation from land clearing can result in dirty, turbid (murky) water that is unsightly and may turn sandy beaches into mudflats. Low oxygen levels can affect biological productivity, including adversely affecting fisheries and marine farming.

2. Current asset condition

There has been no overall assessment of the condition of water quality in coastal waters within the Southern Region.

The National Land and Water Resources Audit determined that of the estuaries within the Southern Region 15 were near pristine, 3 were largely unmodified, 17 were modified and 4 were severely degraded. As for high conservation significance estuaries, most of the pristine estuaries are located on the south and west coast.

Water quality within estuaries on the south and west coast is likely to be very good, due to the lack of modification in these catchments. In contrast, some estuaries on the south east and east coast show signs of reduced water quality, such as elevated chlorophyll and faecal coliform concentrations and intermittently high turbidity and nutrient levels.

3. Issues associated with, or threats to the asset

A number of major threats to estuarine water quality occur within the Region, including:

- Increased siltation from use of cleared land and urban and rural runoff;
- Increased nutrient loads from sewage and agricultural fertilisers;
- Urban effluent;
- Modification of water flow through dams and weirs;
- Marine farms.

In respect to water quality, these threats may manifest as increases in turbidity, algal blooms associated with increasing nutrients, high faecal coliforms from sewage or reduced oxygen levels which affect the overall productivity of the estuary.

All of the threats listed above are likely to be significant threats to estuarine water quality within the Southern Region. The Derwent estuary is considered by the Commonwealth a national hotspot for estuarine water quality, with identified issues including historic heavy metal pollution, intermittent faecal contamination, depressed oxygen levels, and elevated nutrient concentrations.

It is very important to recognise that many threats to estuarine water quality originate from activities that occur further up in the catchment (*eg.* land clearing and agricultural fertilisers), away from the actual estuary. These types of influences on water quality are known as non-point sources of pollution. Sewage outfalls or storm water drains discharging directly into coastal or estuarine waters are known as point sources of pollution. Pollutants from marinas and slipway facilities can have a direct localised impact on water quality.

4. Current responses to issues and threats

The *State Coastal Policy* (1996) not only references other relevant legislation and policies, but also provides a framework for considering natural resource management issues on the coast in an integrated way. It thus provides a significant support to good water quality management in the State's estuaries.

The *Environmental Management and Pollution Control Act 1994* is the principal State legislation that addresses threats to water quality in relation to point sources of pollution.

The *Water Management Act 1999* provides for the preparation of water management plans which must include an assessment of likely detrimental effects of the plan on water quality, taking into account the needs of persons or ecosystems using the water.

The *State Policy on Water Quality Management* seeks to protect or enhance the qualities of most of Tasmania's surface waters, including coastal waters. The policy aims to reduce diffuse and point source pollution to waterways, to ensure water quality monitoring is carried out and to promote integrated catchment management. The policy provides for the determination of Protected Environmental Values (PEVs) and the setting of Water Quality Objectives (WQOs) for individual bodies of water.

The community of the Southern NRM Region has had involvement in setting PEVs for most of the estuaries in the Region and will also be involved in setting PEVs for the remainder of coastal waters within the Region. The community will have involvement in setting resource condition and management action targets for the Region's coastal waters.

The Derwent Estuary Program is a large, joint project involving Commonwealth, State and local government (6 affected councils). Established in 1999, it is designed to address a range of key issues including water quality. The Program's Management Plan was produced in December 2001.

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

The clean coastal waters of this Region are very important for wild fisheries, particularly rock lobster and abalone fishing on the south-west coast and around the lower Channel area. The coastal waters are enjoyed for recreation by locals and provide magnificent scenery for tourists to the Southern area.

However, it is important to recognise that in many cases coastal or estuarine waters near population centres provide a waste disposal service, as outfalls for sewage and stormwater. The disposal of waste in this manner may severely compromise water quality in these waters.

The estuaries are a significant source of recreation for locals and tourists alike, providing activities such as fishing, boating and swimming. Many of the estuaries and coastal bays contain port facilities for commercial and recreational vessels. The Huon River, D'Entrecasteaux Channel and Tasman Peninsula are important marine farming areas for salmon and shellfish such as mussels and oysters.

6. Available data and its usefulness

The Tasmanian Aquaculture and Fisheries Institute (TAFI) conducted a baseline study of physical and chemical water quality indicators in 8 estuaries within the Southern Region (Murphy *et al.* 2003). The study drafted Tasmania specific indicator levels for some key water quality parameters. Results of the study are being made available in the 2003 Tasmanian State of the Environment report.

Water quality data for the Huon estuary was collected and reported in the CSIRO Huon Estuary Study (Butler *et al.* 2000). Follow-up water quality data to this study is currently being collected in the Huon River and D'Entrecasteaux Channel by CSIRO and TAFI.

The State of the Derwent Report (Coughanowr 1997) summarised available environmental data on the Derwent estuary. The author of this report now heads up the Derwent Estuary Program, a joint Commonwealth, State and Local Government initiative to restore and protect the Derwent Estuary. The program includes the collection and collation of water quality data for the estuary.

The Environment Division of DPIWE has historically undertaken some water quality sampling within estuaries in the Southern Region. Data is available on DPIWE databases.

The Tasmanian Shellfish Quality Assurance Program (TASQAP) monitors water quality in shellfish growing areas in relation to toxic algal blooms faecal coliforms. Current monitoring occurs in a number of estuaries and coastal waters including the D'Entrecasteaux Channel, Pitt Water, the Tasman Peninsula, Little Swanport, Great Swanport, and Great Oyster Bay. Data is available through TASQAP.

It is likely that a significant amount of water quality data has been recorded by individual shellfish farmers in these areas but the quality and availability of this data is unknown.

Water quality data is also likely to have been collected by salmonid farmers in the Huon River, D'Entrecasteaux Channel and Tasman Peninsula but the quality and availability of this data is unknown.

It is likely that any community based monitoring of coastal and estuarine water quality within the Region has been minimal, although community monitoring is incorporated within the Derwent Estuary Program. In addition, the Huon Healthy Rivers Project is an integrated catchment management program involving school and community groups, local forestry and aquaculture industries, in water quality monitoring and Landcare activities.

There is no ongoing broad-scale monitoring of water quality within coastal and estuarine waters in the Southern Region.

7. Information gaps and actions required to fill these gaps

In most cases, management of water quality in coastal and estuarine waters is compromised due to a lack of information regarding the relative contribution of catchment activities to water quality problems.

Long term trends in water quality are poorly understood due to a lack of broad scale monitoring and ongoing data collection.

Notwithstanding this lack of information, logic dictates that management strategies that aim to reduce or minimise man made inputs of particulate matter and nutrients into estuaries and the coastal zone will significantly address potential source of water quality decline within the Southern Region. Preparation of water quality improvement plans (Coastal Catchment Initiative) should address these management strategies.

8. Current Aspirational, Resource Condition, and Management Action targets for the asset (at the national, state and/or regional level) and any data on progress towards targets

National aspirational targets for coastal and estuarine water quality are contained in the *National Water Quality Management Strategy* and the *National Principles for the Provision of Water for Ecosystems*.

The National NRM Standards and Targets Framework includes “matters for target”, for which regional targets must be set. Those that apply to coastal and estuarine water quality include; Estuarine, coastal and marine habitats integrity, Nutrients in aquatic environments, and Turbidity/suspended particulate matter in aquatic environments.

Several natural resource management priorities for Tasmania (published in the *Tasmanian Natural Resource Management Framework* (2002), at pp. 16–18) are directly relevant to coastal and estuarine water quality; Water management, Soil management and Management of coastal/marine environment.

Tasmania Together Environmental Goal 23, “*Ensure there is a balance between environmental protection and economic and social development*”, and Goal 24, “*Ensure our natural resources are managed in a sustainable way now and for future generations*”, are particularly relevant to coastal and estuarine water quality.

9. Proposed Management Action targets for the asset (at the national, state and/or regional level)

Suggested achievable actions to achieve these targets

- Preparation of water quality improvement plans (WQIPs) consistent with *Framework for Marine and Estuarine Water Quality Protection*. Ideally, WQIPs should be integrated into NRM plans.
- Set and maintain coastal and estuarine waters Protected Environmental Values.
- Define Water Quality Objectives for coastal and estuarine waters.
- Recognise PEVs and WQOs in adoption of DPIWE's integrated property planning initiative and ensure that plans adequately manage run-off water quality.

10. Relevant scientific publications

ANZECC State of the Environment Reporting Task Force (2000). *Core environmental indicators for reporting on the state of the environment*. Environment Australia, Canberra. 92 pp

Australian Estuaries and Coastal Waterways: A Guide to the Biogeochemistry of Sediment and Water, CD-ROM available at <http://www.agso.gov.au/sales/>

Butler, E., Parslow, J., Volkman, J., Blackburn, S., Morgan, P., Hunter, J., Clementson, L., Parker, N., Bailey, R., Berry, K., Bonham, P., Featherstone, A., Griffin, D., Higgins, H., Holdsworth, D., Latham, V., Leeming, R., McGhie, T., McKenzie, D., Plaschke, R., Revill, A., Sherlock, M., Trenerry, L., Turnbull, A., Watson, R., and Wilkes, L., (2000) CSIRO, Huon Estuary study, Environmental research for integrated catchment management and aquaculture. *Project number 96/284*. 285 pp

Coughanowr, C (1997). State of the Derwent Estuary – a review of environmental quality data to 1997. *Supervising Scientist Report 129, Supervising Scientist, Canberra*. 130 pp

Edgar, G.J., Barrett, N.S. and Graddon, D.J. (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 Technical Series Report 2*,. 205 pp

Murphy, R.J, Crawford, C.M and Barmuta, L (2003) Estuarine Health in Tasmania, status and indicators: water quality. *Tasmanian Aquaculture and Fisheries Institute Technical Report Series No. 16*. 114pp

OzEstuaries Database at <http://www.ozestuaries.org/>

EstuarineWQ South+AH.doc

Ward, T., Butler, E. and Hill, B. (1998). *Environmental indicators for National State of the Environment reporting – Estuaries and the Sea*. Australia: State of the Environment (Environmental Indicator Reports), Department of Environment, Canberra. 80 pp

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