

DRAFT

REGIONAL NRM STRATEGY DEVELOPMENT

MARINE AND ESTUARINE HABITAT

NORTH WEST REGION

1. Overview of the marine and estuarine environmental assets within the Region

The Tasmanian marine and estuarine environments are a significant asset of the State. Tasmania has more coastline per unit land area than any other State in Australia – about 4900km (excluding Macquarie Island) [Australian Surveying and Land Information Group 1993]. Tasmania's marine and estuarine environments include rocky reefs, wetlands, saltmarshes, river estuaries, harbours and open coast. Tasmania's marine and estuarine environments are incompletely described (Zann 1995) although recent work has greatly improved our understanding of much of the inshore habitats in the south east of the State. Tasmania's rich variety of marine and estuarine life includes delicate basket stars and leafy seadragons, giant kelp forests, seagrass beds, sponge gardens, endangered handfish and seastars, crustaceans, plankton, fairy penguins, great white sharks, turtles and migrating whales.

Marine environments can be classified into a hierarchical system of both large biogeographical provinces and smaller bioregions. The Tasmanian marine environment has two biogeographical provinces (bioprovinces): the Bassian bioprovince and further south, the Tasmanian bioprovince. Based on the distribution of reef plants and animals, the Bassian and Tasmanian marine bioprovinces are further divided into eight distinct bioregions (Edgar *et al* 1995) and four of these bioregions occur in the area covered by the North West Region (See Map 1). The north coast of Tasmania tends to be rocky, with sand and muds offshore and lies entirely within the Boags bioregion. The waters of the Boags bioregion are generally relatively homogeneous along the whole north coast and contain the highest number of species found in the Tasmanian bioregions. The calmer sea conditions result in the absence of surf-tolerant species (Edgar *et al* 1995).

Waters surrounding King Island fall within the Otway bioregion. Many of the intertidal invertebrates and other species in the water are typical of South Australian species (Edgar *et al* 1995). The west coast and southwest coast is divided into two marine bioregions: the Franklin bioregion and the Davey bioregion, although most is contained within the Franklin bioregion. This primarily rugged, rocky coastline is broken only at Macquarie Harbour and where several large rivers form relatively large estuaries (eg. the Pieman and Arthur rivers). The Franklin bioregion is notable for the fact that it has a relatively low diversity of species and an obvious lack of characteristic species (Edgar *et al* 1995). The extreme wave energy in this bioregion appears to reduce the number of species present. The Davey bioregion has a low number of fish species and a range of algae that are distinctly different from those

Estuarine Habitat NW

found elsewhere (Edgar *et al* 1995). The influence of dark, tannin-stained water in the water column on the marine benthos is considerable in this bioregion.

The North West Region contains several marine and estuarine habitats of significant value to the State. Lavinia Nature Reserve on King Island is a RAMSAR listed wetland. It is one of only a few remaining, largely unaltered natural areas on the island. The site is of critical importance as a feeding area for the endangered Orange-bellied parrot (*Neophema chrysogaster*). The Robbins Passage / Boullanger Bay wetlands in the far northwest of Tasmania are of outstanding significance to shorebirds. The wetlands and saltmarshes provide breeding, roosting and feeding habitat for the largest diversity and density of migratory and resident shorebirds found anywhere in Tasmania. The area is home to two species of shorebirds nationally listed as threatened with extinction, the endangered Little Tern and the vulnerable Hooded Plover, fifteen birds that are listed on the Japan-Australia Migratory Bird Agreement (JAMBA) and / or the China-Australia Migratory Bird Agreement (CAMBA). These birds are also listed under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999*. The shorebird values have led to the listing of the Robbins Passage Wetlands area on the Register of the National Estate, and it is seen as fulfilling five of the criteria for Ramsar listing as a Wetland of International Significance. It also meets the conditions necessary for recognition as an Important Bird Area.

The North West Region contains two Class A estuaries, the Black River and Wanderer estuary, as assessed by Edgar *et al* (1999). Class A estuaries are those assessed as possessing critical conservation significance. These are estuaries and associated catchment areas that show minimal effects of human activities and are identified as key components within an integrated system of representative reserves around Tasmania. They also include sites with exceptional fish and invertebrate biodiversity.

Several species listed under the *Tasmanian Threatened Species Protection Act 1995* are known to occur in marine and estuarine environments within the North West Region. The Australian Grayling *Prototroctes maraena* is a fish species normally found in fresh water and estuaries but requires a marine stage in its breeding cycle. The North West Region appears to be an ecological 'hotspot' for this species. The Port Davey skate *Raja* sp is another listed species that very little is known about. Its distribution is presently restricted to Port Davey and Macquarie Harbour.

Other migratory marine species, such as whales, pass through waters within the North West Region en-route to breeding or feeding grounds and a number of these species are protected under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*. Several other species are only occasional visitors to Tasmanian waters and do not breed here (eg. marine turtles).

The marine and estuarine environments within the North West Region also support important marine farming and wild fisheries industries that are heavily dependent on

Estuarine Habitat NW

healthy ecosystems. There are also many themes of cultural heritage within these waters including Aboriginal heritage and numerous shipwrecks. The Tasmanian coastal zone is also being increasingly recognised for its important recreational resources and a growing tourism market.

2. Current asset condition

There is very limited information available on marine and estuarine environments across the North West Region, or indeed within the State. Work by Edgar (1984) and Edgar *et al* (1995), on the biota of the State's coastal waters has been used to identify the marine bioregions described previously. Edgar *et al* (1999) also classified 111 Tasmanian estuaries and assessed these for the conservation significance, concluding that two estuaries within the North West Region are of critical conservation significance (see above). The National Land and Water Resources Audit determined that of the 38 estuaries within the North West Region 14 were near pristine (mostly located on the west coast), 3 were largely unmodified, 15 were modified and 6 were severely degraded.

Recently, the Tasmanian Aquaculture and Fisheries Institute (TAFI) has completed inshore habitat mapping around Robbins Island that has greatly improved our knowledge of this area and work by Rees (1993) mapped seagrass distribution around the Tasmanian coastline including areas within the North West Region. However much of this work has been done at a macro level and there is a real need for baseline data at a much finer scale to be collected so it can be established exactly what habitats exist within the Region. This information is critical in the decision-making framework that allows these resources to be sustainably managed.

A number of fisheries management plans have also been implemented under the *Living Marine Resources Management Act 1995* to cover important commercial species, such as abalone and rock lobster, which are fished within the North West Region.

3. Issues associated with, or threats to the asset

Marine and estuarine environments are extremely complex and dynamic systems influenced by a range of spatial and temporal gradients, with species and communities in a state of constant flux. It is estimated that over a quarter of the area of the state of Tasmania is below the high water mark. Yet there is a significant lack of knowledge about the condition of the ecology of the marine and estuarine environments of Tasmania, which creates a great deal of uncertainty about how to manage human impacts.

What is known however, is that healthy marine and estuarine environments provide significant ecosystem services critical to human health and well being, for the protection of natural resources and for economic uses. A range of human activities threaten many marine and estuarine environments as a result of intensified land use

Estuarine Habitat NW

and demand for limited coastal resources. Several key impacts identified within Tasmania include:

- Introduced pest flora and fauna;
- Loss of marine and estuarine habitats, which in turn impacts on the ongoing viability of coastal zone use and productivity;
- Over-exploitation of marine and estuarine resources;
- Non-point source urban and catchment pollution;
- Increasing residential development on unique coastal habitats;
- Marine pollution;
- Increased sedimentation and acid sulfate soils from agricultural production;
- Reduced environmental flow regimes from upstream water abstractions.

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 includes a statutory requirement for monitoring through a report on the coastal zone in the five yearly State of Environment Report.

The *Living Marine Resources Management Act 1995* places responsibility on the Government to manage and protect the State's living marine resources in a sustainable manner. The Act has clear objectives for protection and management of fish and their habitats in a sustainable way for the enjoyment of all 'users'.

The *Marine Farming Planning Act 1995* makes provision for zoning of State waters by way of marine farming development plans, preparation of an environmental impact statement in relation to draft marine farming development plans, management controls to regulate marine farming activities within marine farming zones and the allocation of leases over areas within marine farming zones.

The *Threatened Species Protection Act 1995* provides for the protection and management of threatened native flora and fauna and promotes the conservation of native flora and fauna.

Since 1999, Environment Australia require assessments of the ecological sustainability of wild export fisheries, such as abalone and rock lobster, under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Tasmanian Shellfish Quality Assurance Program assesses contaminants and dinoflagellates under requirements through the *Public Health Act 1997* and the *Food Act 1998*.

Since 1999, TAFI has implemented a program called SEAMAP Tasmania that is mapping the distribution of seafloor habitat types in estuarine, coastal and marine

Estuarine Habitat NW

waters of Tasmania through photographic, acoustic, biological and sediment sampling. Maps, video and images are published or updated, as they become available (see www.utas.edu.au/docs/tafi/seamap/index.htm). Currently the SEAMAP Tasmania program has progressed up the east coast of Tasmania, heading in a anticlockwise direction around the State as far north as Schouten Island. It is the intent, however, that by 2008 all inshore habitats out to the 40m depth contour will have been mapped around the whole of the Tasmanian coastline and several of the Bass Strait Islands.

Baseline surveys investigating the presence and current distribution of introduced marine pests for the 'major' ports of Burnie, Devonport, Port Latta and Stanley have been or soon will be completed. Similar surveys, although on a slightly less intensive scale, are to be undertaken for the 'minor' port of Strahan and for Port Davey anchorages.

The Conservation of Freshwater Ecosystems Value Project is part of the implementation of the State's Water Development Plan with the purpose of designing and implementing a conservation management system based on CAR (Comprehensive, Adequate and Representative) principles. The Project is conducting a Statewide audit of ecological values associated with a range of aquatic ecosystems including wetlands, estuaries and saltmarshes. A number of conservation measures will be implemented to protect significant ecosystem values including recommendations and prescriptions on development and management activities impacting on the values, voluntary conservation agreements with private landholders and, where appropriate, reserves on public land.

Parks and Wildlife Management Plans for 88 offshore islands are drafted and going through the approval process. The existing tenures of the islands are very mixed including Nature Reserve, National Park, Game Reserve, State Reserve, Conservation Area and Unallocated Crown Land. These Management Plans, however, will provide a significantly higher level of control over activities on the islands including a number contained within the North West Region.

The Tasmanian Government is committed to establishing a Tasmanian Representative System of Marine Protected Areas that will have broad-based community support. The Tasmanian Marine Protected Areas Strategy was developed and released in 2000. Its primary goal is to establish and manage a comprehensive, adequate and representative system of Marine Protected Areas, whilst taking into account and minimising any negative impact on social, cultural and economic values.

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

The coastal waters of the North West Region are important for wild fisheries and aquaculture. The waters on the west coast and around King Island are important fishing grounds for the State's most valuable wild fisheries, rock lobster and abalone. Locally, scalefish make an important contribution to the Tasmanian seafood industry and there is a significant kelp collection and processing industry on King Island and the west coast. The area is also used extensively by the recreational community and supports a steadily growing tourist market.

There are three marine farming development plans currently operating within the North West Region. The Port Sorell and Far North West plans provide water that is predominantly used for the culture of Pacific oysters while the Macquarie Harbour plan supports a rapidly expanding salmonid industry. Under *the Marine Farming Planning Act 1995* each of these plans must be reviewed within ten years of their implementation. It is unlikely that significantly more will be zoned, in that existing plans are considered to have included most of the suitable water.

The natural beauty of the Arthur River, Pieman River and Macquarie Harbour estuaries is a major tourist asset that supports a number of scenic boat cruises. A number of other tourist ventures could potentially exist within this Region by taking advantage of the native fauna that inhabits this area eg: whale and seal watching tours.

6. Available data and its usefulness

Edgar (1994) and Edgar *et al* (1995) has published work classifying Tasmanian Coastal waters as part of some preliminary research conducted to identify representative marine protected areas within the State. Edgar *et al* (1999) also published work classifying 111 Tasmanian estuaries for their conservation significance using ecological and physical attributes, population and land use.

These works are effectively the only attempts to strategically assess the marine and estuarine environments within the State over the last two decades. Other supplementary work that complements this research includes unpublished theses by Last (1983) and Rees (1993) who examined, respectively, the ecology and zoography of fishes from soft-bottom habitats of the Tasmanian shore zone, and Tasmanian seagrass communities.

As previously mentioned the Tasmanian Aquaculture and Fisheries Institute has recently completed inshore habitat mapping around Robbins Island. The Robbins Passage Wetlands Coast & Landcare Group (RPWG) has also just completed a values mapping project, undertaken by World Wide Fund for Nature Australia, for the Robbins Passage / Boullanger Bay wetlands area.

Estuarine Habitat NW

Baseline surveys investigating the presence and current distribution of introduced marine pests for the 'major' ports of Burnie, Devonport, Port Latta and Stanley have been or soon will be completed. Similar surveys, although on a slightly less intensive scale are to be undertaken for the 'minor' ports of Strahan and for Port Davey by the end of 2003. Information collected from these surveys will be provided to a Decision Support System that is being set up by the Commonwealth to assess the risk of pest translocation through international and coastal shipping movements.

There is a fairly large body of work that has been conducted within Macquarie Harbour (See De Blas 1994, Koehnken 1996) although most of this work focuses on the effects of the acid mine drainage that is delivered into the Harbour from the King River.

For each of the three marine farming development plans that exist within the North West Region, environmental impact assessments were undertaken that included an examination of the marine and estuarine habitats that occur in those areas under consideration for marine farming (see www.dpiwe.tas.gov.au). Following the implementation of the plans each lease holder has also been required to supply the Marine Environment Section of DPIWE with individual habitat maps of their lease areas.

Barrett and Wilcox (2001) have conducted biological surveys and habitat mapping of proposed Marine Protected Areas by the Tasmanian Fishing Industry on three sections of the north coast within the North West Region.

DPIWE's ricegrass management team have also mapped the extent of the ricegrass (*Spartina anglica*) infestation within the North West Region and have spent the last four years working with local communities to eliminate this introduced pest species from the north coast between the Marcus River and Black River and to maintain a designated ricegrass free zone within the Port Sorell estuary.

7. Information gaps and actions required to fill these gaps

There is a serious lack of baseline data describing marine and estuarine habitats and ecosystems within the North West Region.

Some of the actions required to fill these gaps include:

- The establishment of a comprehensive Statewide database of coastal and estuarine species and ecosystems.
- The establishment of coordinated monitoring programs, including permanent monitoring stations, along the north and west coast.
- Reviews of the conservation status of coastal and estuarine species and habitats to determine appropriate resource management and conservation measures.

Estuarine Habitat NW

- Improved education and training, and the communication of collected information, to develop community skills and partnerships to enhance coastal and estuarine management.
- Installation of water meters (at least within priority catchments) where over-allocation of the water resource may be occurring and appropriate environmental flow regimes need to be set.

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

The following NRM National Outcomes [??SOURCE??] apply to marine and estuarine habitats within the North West Region:

- The development of sustainable production systems, which maintain or rehabilitate biodiversity and ecosystem services,
- The avoidance or minimisation of threatening processes on locations or systems which are critical for the conservation of biodiversity, agricultural production, cultural and social values,
- The maintenance of biodiversity, populations of significant species and ecological communities and ecosystem services and functions.

The National NRM Standards and Targets Framework includes “matters for target”, for which regional targets must be set. These include estuarine, coastal and marine habitat integrity, nutrients in aquatic environments, turbidity / suspended particulate matter in aquatic environments, significant native species and ecological communities and ecologically significant invasive species.

In addition Tasmania *Together* Goal 20 (our economy) and Goals 21, 22, 23 and 24 (our environment) are relevant to the protection and conservation of marine and estuarine habitats.

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

The following are proposed as achievable goals to achieve these targets:

- Maintain marine and estuarine Protected Environmental Values.
- Continued habitat mapping under SEAMAP Tasmania to ensure all marine and estuarine areas within the North West Region are mapped as a minimum out to the 40m depth contour.
- Adopt DPIWE’s integrated property planning initiative to manage diffuse source pollutants.
- Better coordination of integrated catchment management practices and the setting of appropriate environmental flow regimes to maintain healthy ecosystem function in downstream estuaries and inshore marine environments.

Estuarine Habitat NW

- Continue monitoring at major ports for new introduced marine pests.
- Continued implementation of the State's Marine Protected Area Strategy, with a view to ensuring better representation in the North West Region.
- Better understanding of the relative contribution that different land use practices make to water quality and quantity.

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 Land Information Group 1993, *1:100 000 Coastline database*, Australian Land Information Group, Canberra.

Bryant, S. G. and Jackson, J. (1999) *Tasmania's Threatened Fauna Handbook: what, where and how to protect Tasmania's threatened animals*. Threatened Species Unit, Parks and Wildlife Service, Hobart.

De Blas, A. 1994 *The Environmental Effects of Mount Lyell Operations on Macquarie Harbour and Strahan*, Australian Centre for Independent Journalism University of Technology, Sydney.

Department of Environment 1975, *Heavy Metals and Mine Residues in Macquarie Harbour*, Department of Environment, Tasmania.

Edgar, G. J., 1984, *Marine Life and Potential Marine Reserves in Tasmania: Part 2*, Occasional Paper No. 7, National Parks and Wildlife Service Tasmania.

Edgar, G. J., Moverley, D., Peters, D., and Reed, C. 1995 *Regional Classification of Tasmanian Coastal Waters and Preliminary Identification of Representative Marine Protected Area Sites*, Ocean Rescue 2000 Project D705, Parks and Wildlife Service Tasmania.

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.

Koehnken, L. 1996, *Macquarie Harbour – King River Study*: Technical Report, Department of Environment and Land Management, Tasmania

Last, P. 1983, Aspects of the Ecology and zoography of fishes from soft-bottom habitats of the Tasmanian shore zone, Unpublished Doctoral thesis, Zoology Department, University of Tasmania.

Estuarine Habitat NW

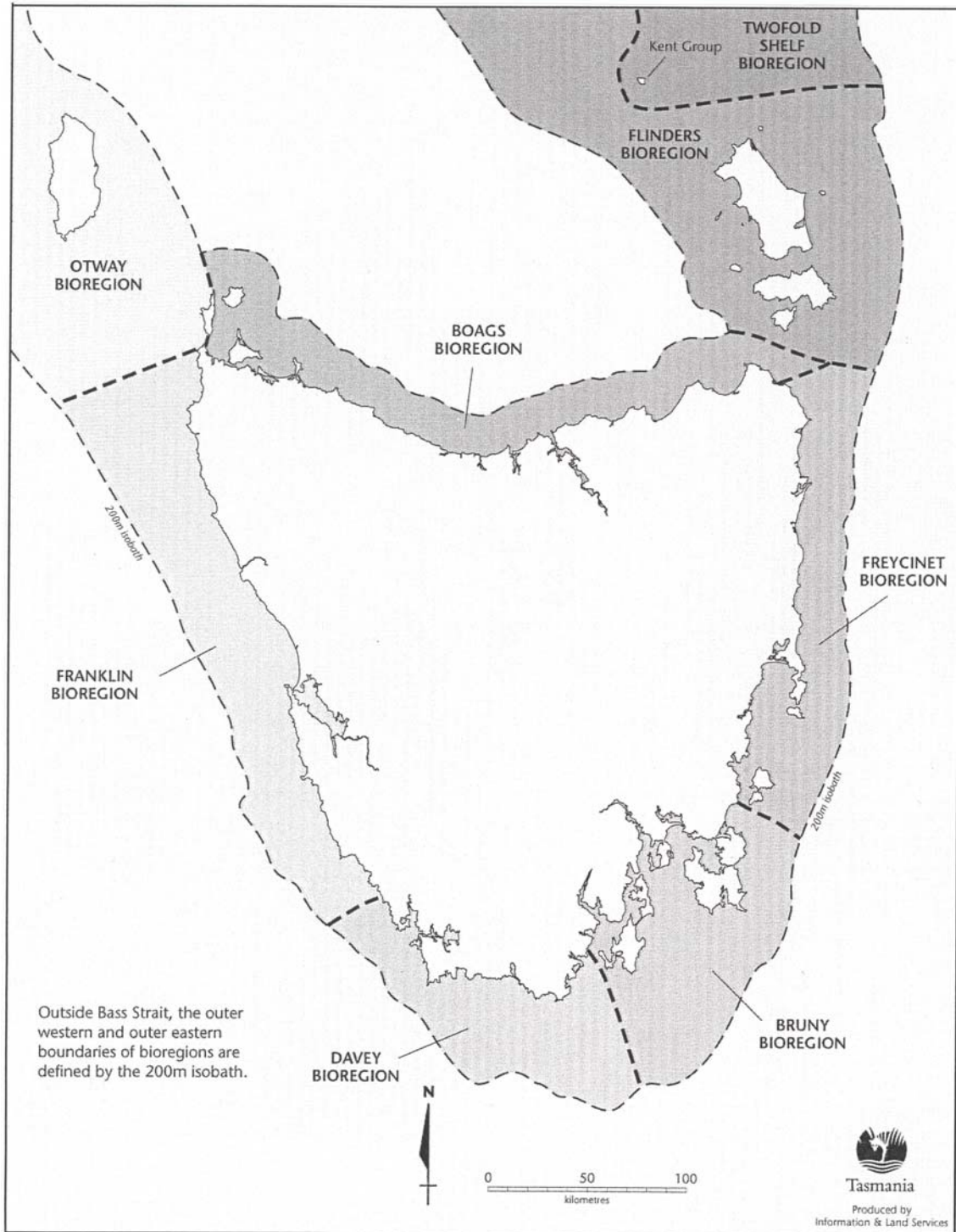
Murphy, R.J, Crawford, C.M and Barmuta, L (2003) *Estuarine Health in Tasmania, status and indicators: water quality*. Tasmanian Aquaculture and Fisheries Institute Technical Report Series No. 16.

Rees, C. 1993 Tasmanian seagrass communities, Unpublished MSc thesis, Department of Geography and Environmental Studies, University of Tasmania

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.

Zann, L. P., 1995, *State of the Marine Environment Report for Australia*, Great Barrier Reef Marine Park Authority for Ocean Rescue 2000.

Estuarine Habitat NW



Map 1. Tasmanian Interim Bioregions

Note: It is recognised that the definition of bioregions under the Interim Marine and Coastal Regionalisation of Australia is interim and is based upon the best possible available information. As an ongoing iterative process, it will be subject to change in light of new information.

Estuarine Habitat NW

CONTRIBUTORS TO PAPER

The following people have been involved in the drafting of this paper:

Author:

NAME	POSITION	AGENCY
Colin Shepherd	Principal Marine Environmental Officer	Marine Environment Section, Marine Resources, DPIWE

Others:

NAME	POSITION	AGENCY
Ray Murphy	Acting Senior Marine Environmental Management Officer	Marine Environment Section, Marine Resources, DPIWE
Darby Ross	Manager	Marine Farming and Environment Section, Marine Resources, DPIWE
Chris Rees	Manager – Coastal & Marine	Coastal Management, Environment Division, DPIWE
Doug Nicol	Principal Fisheries Management Officer	Wild Fisheries, Marine Resources, DPIWE
Rebecca Pinto	Senior Aquatic Ecologist (Environmental flows)	Water Assessment and Planning, Water Resources, DPIWE

Date: 28 July 2003