



Working on the Coast



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This manual provides best practice guidelines for many small-scale works in coastal areas. It is designed for local government, other land managers and contractors who undertake works on the coast.

The Manual explains the physical coastal processes that shape our coastline and the unique and important coastal values that require careful management. It describes key impacts of common coastal work activities and provides recommendations of what to do and what to avoid during these activities to protect coastal values.

The coastal environment is dynamic and complex and the shoreline is always changing in response to the interactions between wind, waves and tides. Coastal systems are delicately balanced to survive in these highly changeable environments. Management of these areas is further complicated by the number of authorities having land management and legislative responsibilities, some of which overlap or are not clearly defined.

Marine and coastal ecosystems are predicted to be highly vulnerable to the impacts of climate change. Coastal wetlands will be particularly vulnerable to changes in hydrology and the impacts of sea level rise. Significant areas of Tasmania's coast are at risk of erosion from exposure to sea level rise and storm surge inundation (DPIPWE 2010).

To work successfully in the coastal zone, and to avoid costly problems in the future, land managers will need an understanding of physical coastal processes, and have the wisdom to know when it is better to do nothing, by applying the precautionary principle. It is important to seek specialist advice and consult broadly with other coastal stakeholders and the community.

Tab Illustration by Brett Littleton

1.1 Tasmania's coastline

Tasmania's coastline boasts vast and diverse coastal features such as estuaries, dunes, sandy beaches, rocky shores and headlands, sea cliffs, lagoons, tidal creeks and rivers, intertidal flats, rocky reefs, harbours and open coast. It also supports a wide range of habitats and ecosystems such as heathlands, woodlands, saltmarshes, seagrass beds, sponge gardens and kelp forests, as well as a rich variety of birds, fishery resources and marine life.

Tasmania's coast is a valuable and irreplaceable asset with diverse and sensitive natural and cultural values that require protection. Many coastal areas are highly valued for recreation, tourism, resources (such as fisheries), amenity and intrinsic values.

Tasmania has a remarkably long coastline for its size, due to a highly indented shoreline with large estuaries, harbours and embayments, and many offshore islands,

Figure 1.1 South coast track in the World Heritage Area
© Chris Rees



including those in the Furneaux Group and King, Maria, Bruny and Macquarie Islands (Sharples 2006). Tasmania has a longer coastline than Victoria and NSW combined (Mount 2001).

No place in Tasmania is more than 115km from the sea and most population centres and major industries are on or near the coast. Many Tasmanians live, work and play on the coast.

1.2 Coastal processes

The coastal zone is not a stable and constant environment, but a dynamic place that can change rapidly in response to natural processes such as seasonal weather patterns.

Waves, winds, currents, tides and storms are the major forces on the coast. The results of actions and interactions of these natural forces on the shoreline and near-shore seabed are called coastal processes. These include erosion and deposition, movement of dunes, longshore drift, and the effects of storms on the coastline.

There are complex issues at the land and sea interface and an understanding of the connectivity between the catchment and the coast is essential in managing coastal issues and landscapes. Activities in the catchment can affect the water quality of river systems and wetland areas, which in turn impacts on the health of coastal and marine environments. This can have implications for natural values such as seagrass beds, fish stocks and biodiversity.

Many coastal foreshores are still responding to the last sea level rise around 6 000 to 7 000 years ago and will continue to respond to increases in sea level associated with climate change.

The geology, alignment of coastal landforms and local

geomorphology (orientation and shape of coastal landforms) can all influence how coastal processes operate. The alignment of the coast influences the way waves are bent (refracted) as they approach the shore and the way they are aligned to the coast, and therefore how sand is moved along the shoreline.

Waves

Waves are formed by winds blowing over the sea. Waves are the most important force on sandy coasts because they transport sand on- and offshore and can also move sand along the shore. In winter, beach profiles often become steeper due to stronger wave action, which removes sand from the beach and deposits it on offshore sandbars. In summer, calmer waves bring sand back to the beach (Figure 1.2).

The relative amounts of summer deposition and winter erosion can mean that sand dunes gradually move either seaward or landward. Beaches backed by parallel ridges (eg. Seven and Nine Mile, Rheban and many in the north-west) demonstrate a history of accretion (sand build-up) and seaward expansion. Others, like Roches Beach in the east and Ocean Beach in the west, appear to have entered a new phase of sustained erosion.

Currents

Nearshore currents are created by winds, waves, tides and river flows. These currents may transport large amounts of sand and alter the shape of offshore sandbars.

Longshore currents (longshore drift) occur when waves come in at a slight angle to the shoreline. Each wave washes sand grains diagonally up the beach, the sand moves down the beach with the backwash and is then edged a little further along the beach by the next wave.

As a result, the sand is carried in a zigzag pattern along the beach and can cause an overall movement of sand and currents in one direction, called longshore drift. The effects of longshore drift can be observed by noting where sand builds up against a solid object (e.g. a groyne) or by the way a spit forms across a river mouth.

Rip currents can also carry large amounts of sand to offshore bars during wilder weather.

Tides

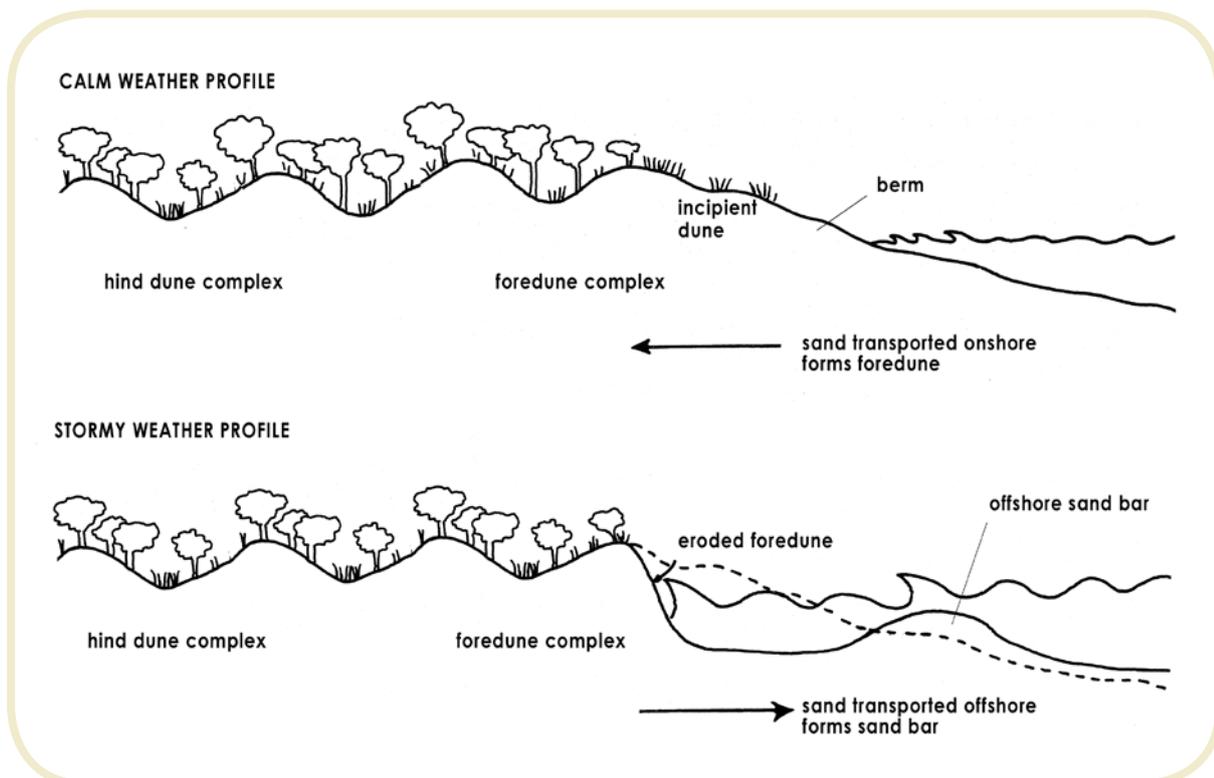
Tides play a more indirect role in transporting sand and altering the shape of sandy coastal areas. The ebb and flow of tidal waters can create tidal currents that transport sand and are mostly seen in areas where there is a narrow passage between landforms.

Tides play an important role in coastal estuaries where the regular inundation of low-lying areas often supports saltmarsh and wetland habitats which are important water filters and fish nursery areas.

In the lunar month, the highest tides occur roughly every 14 days, at the new and full moons, when the gravitational pull of the moon and the sun are in line. These are called **spring tides** (Tarbuck & Lutgens 1987).

On Australia's east coast, the highest tides occur

Figure 1.2 Beaches and foredunes undergo major cycles of change, as storm waves drag sand out to the surf zone and calmer swells bring the sand back onshore. The beach, foredune and offshore sandbar are all part of the one dynamic system. Source: Community Coastcare handbook (Thorp 2005)



during the winter months of June, July and August, and the summer months of December, January and February. The highest of each of these periods (i.e. one in winter and one in summer, totalling two per year) are known as the **king tides**.

The winter king tide usually occurs at night and may go unnoticed. Consequently the summer king tide, usually during the daytime, catches the most attention (Tarbuck & Lutgens 1987).

Wind

Wind takes over as the main dune-forming process above the high tide mark. Wind picks up sand grains deposited by waves and moves them landwards until vegetation (or other obstructions) slows the wind, and the sand grains fall. Sand grains become trapped in vegetation and form dunes. Wind is also a cause of dune erosion and blowouts, often when vegetation has been disturbed and sand becomes mobile.

Storms

Storms can dramatically change beach, dune and bar systems in a very short period. Storms produce high energy and steep waves that can erode beaches, destroy foredunes and even erode the dunes behind. It often takes years after a storm before the original dune is restored; intervention may be required if public safety is at risk.

In some locations, 90% of the amount of sand moved by the annual longshore drift can occur in just two weeks during very stormy periods. A major storm or succession of storms is likely to occur every 20 years or so.

Shoreline erosion and recession

Erosion is the wearing away of land or the removal of beach or dune sediments by wave action, tidal currents, wave currents, wind or drainage. Erosion may result in long-term losses of sediment and rocks, or merely the temporary redistribution of coastal sediments.

Recession is the result of ongoing erosion with no sediment replenishment, resulting in the landward retreat of the shoreline.

The impacts of sea level rise and climate change will result in more frequent and severe storm events and higher sea levels will increase the rate of coastal erosion and lead to coastal recession in many coastal areas.

Sediment budget

Sediment budget refers to the balance between sediment added to and removed from a sandy coastal system by coastal processes. When more material is added than is removed, there is a surplus of sediment and the shore builds seaward. Coastal erosion occurs when coastal processes remove more material from the shore than is added.

The movement of sand and sediment in coastal areas is very important to the way humans use the coast. Sand can build up in unwanted areas (river channels) and be eroded from valued sandy landforms such as beaches. Understanding coastal processes is essential to ensuring that coastal works do not cause unwanted changes to sand movement such as increasing erosion.

Figure 1.3 Significant saltmarsh areas are associated with Duckhole Rivulet within the Pitt Water-Orielton Lagoon Ramsar site in south-east Tasmania.
© Vishnu Prahalad

1.3

1.3 Managing conflicting uses of coastal areas

Tasmania's coast is an irreplaceable asset of natural, economic, recreational, cultural and historical significance. Managing the coast and coastal resources requires a balance between these values. Sometimes the range of activities and values associated with any particular area of coastline can be in conflict.

Planning in coastal areas needs to take into account the range of coastal values, assets and land use types, to ensure that land use is appropriate for the area and not likely to create conflict in the future.

Coastal land management is further complicated because a range of legislation and a number of different authorities are responsible for managing the spectrum of coastal values.

There are no simple answers for managing conflicting uses but the best outcomes are achieved through a holistic approach that includes consideration of natural, economic and cultural values, the natural processes, community perception, the land use, threats and unique local issues. Broad consultation, expert advice and planning are essential.

Tips for managing conflicting uses

- Public safety must be paramount
- Identify all of the stakeholders in your particular area
- Identify all of the values through consultation with stakeholders and by seeking expert advice
- Identify all the natural and cultural heritage values – seek expert advice
- Identify the threats, both present and future
- Provide lots of opportunities for stakeholders to be involved in planning and decision-making, as this will reduce conflict in the long term
- Ensure that you understand the relationships between the potential coastal uses and values – some may be completely incompatible



Case Study 1.1: Pitt Water-Orielton Lagoon Ramsar site – an example of the complexity of managing coastal areas

Pitt Water-Orielton Lagoon is an extensive and diverse wetland system in south-eastern Tasmania providing habitat for migratory and resident shorebirds and is an important estuarine ecosystem for marine life. The lagoon area provides habitat for a number of threatened bird species and is one of only a few locations in the world that is home to the threatened Tasmanian live-bearing seastar (*Parvulastra vivipara*).

The wetland supports a number of threatened plant species as well as some of the most significant saltmarsh habitat in Tasmania. The area is an important nursery for the commercially valued school shark and also supports commercial oyster farming. Recreational activities include fishing, paddling, windsurfing and kite-surfing. The area is also rich in Aboriginal heritage values.

The wetland is surrounded by residential development and high-intensity agricultural land as well as some light industry and a golf course.

Pitt Water-Orielton Lagoon is one of 10 internationally recognised Ramsar sites in Tasmania. Ramsar wetlands are recognised as Wetlands of International Importance by the Ramsar Convention, an intergovernmental treaty that provides the framework for international cooperation for the conservation and wise use of wetlands.

Parts of the wetland area are also managed as a Nature Reserve under the *National Parks and Reserves Management Act 2002*. The Parks and Wildlife Service (DPIPWE) is responsible for

managing the nature reserve; Crown Land Services (DPIPWE) is responsible for the management of any unallocated Crown land; the Biodiversity Conservation Branch of DPIPWE is responsible for upholding the commitment to the Ramsar Convention; the Sorell and Clarence City Councils are responsible for stormwater management and any areas of council land.

In addition, the wetland is bisected by two causeways managed by the Department of Infrastructure, Energy and Resources.

A range of other legislation also covers the heritage values, threatened species, fisheries and marine resources and weed management. The migratory shorebirds that use this area annually are protected under a number of international agreements including CAMBA*, JAMBA** and ROKAMBA^, to which Australia is a signatory.

In addition to these natural and cultural values the area receives stormwater from the surrounding residential areas, is under pressure from inappropriate access by vehicles, horse and dogs, has some significant weed incursions and is subject to agricultural runoff from the surrounding catchment.

A management plan for the area has been created by the Parks and Wildlife Service to guide its activities and a collaborative project, being implemented by a committee that represents the majority of the stakeholders, has produced some good outcomes in managing access, controlling weeds, protecting Aboriginal heritage, raising awareness and protecting bird values and habitat.

*China-Australia Migratory Bird Agreement **Japan-Australia Migratory Bird Agreement ^Republic of Korea-Australia Migratory Bird Agreement

1.4 Legislation

This section details the legislative framework of coastal management decision-making and the more common legislation that will be triggered by activities and works in coastal environments.

Coastal management in Tasmania is complex and a number of authorities are responsible for different jurisdictions. Always seek advice to ensure that planned activities meet the legislative requirements.

In addition to the information provided here, **Appendix 1** lists the relevant legislation for coastal management. The legislative and policy requirements for each type of activity are listed in **Appendix 2**.

1.4.1 Resource Management and Planning System

All planning decisions made in Tasmania fall under the umbrella of Tasmania's Resource Management and Planning System (RMPS). All the legislation that contributes to the RMPS has five common objectives that drive decisions about the use of land and natural resources in the state:

- promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity
- provide for the fair, orderly and sustainable use and development of air, land and water
- encourage public involvement in resource management and planning
- facilitate economic development in accordance with these objectives
- promote the sharing of responsibility for resource management and planning between the different spheres of government, the community and industry in the state.

The RMPS covers:

- local planning schemes that are prepared and administered by councils
- state policies applicable to particular issues, which must be adhered to by both local and state government
- a single appeal system involving the Resource Management Planning Appeal Tribunal (RMPAT)
- a suite of processes and instruments which gives legislative effect to the RMPS objectives above

1.4.2 Tasmanian coastal legislation

Aboriginal Relics Act 1975

The *Aboriginal Relics Act 1975* provides for the preservation of Aboriginal relics and the declaration, management and protection of Protected Sites. Under the Act, Aboriginal heritage is referred to as 'relics', and includes such things as artefacts, paintings, carvings, engravings, arrangements of stones, middens, or any objects, sites, or places that show signs of the activities of Aboriginal inhabitants.

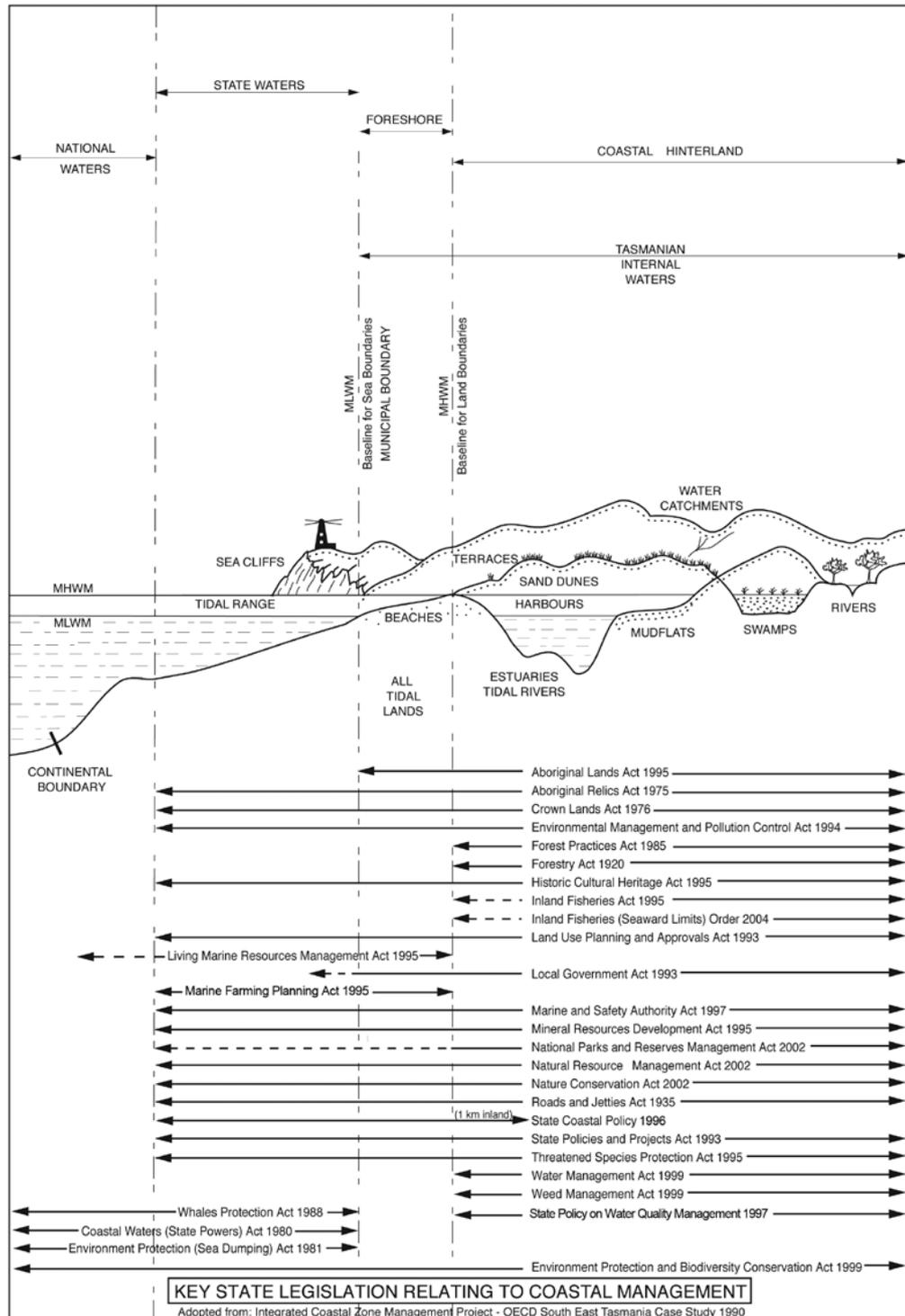
All Aboriginal heritage is protected under the *Aboriginal Relics Act 1975*. If at any time during works Aboriginal heritage is suspected, you must cease works immediately and contact Aboriginal Heritage Tasmania for appropriate management advice.

Crown Lands Act 1976

In Tasmania, the majority of coastal land is Crown land covered by the *Crown Lands Act 1976*. The Act governs the management and use of Crown land, including land that is licensed or leased from the Crown.

Crown Land Services (DPIPWE) is responsible for the assessment of all applications for the use of Crown land, including the private use of land reserved under the *Crown Lands Act 1976* and land reserved

Figure 1.4 Key state coastal legislation. Adapted from: Integrated coastal zone management project – OECD south-east Tasmania case study 1990.



under the *National Parks and Reserves Management Act 2002*. The Parks and Wildlife Service are however responsible for the day to day management of land reserved under the *National Parks and Reserves Management Act 2002*.

All land below the high water mark falls under the jurisdiction of the Crown. Developments involving Crown land may also require approval from council under the *Land Use Planning and Approvals Act 1993*.

Environmental Management and Pollution Control Act 1994

The *Environmental Management and Pollution Control Act 1994* (EMPCA) is the primary environment protection legislation in Tasmania. The role of EMPCA is to integrate local government and state planning assessment, and environmental management and approvals. Three classes of activities are identified under EMPCA (Levels 1 to 3), reflecting the range of potential environmental impacts.

Local government authorities have responsibility for the assessment, approval and environmental regulation of smaller-scale activities (Level 1) and must endeavour to prevent or control activities that might cause pollution.

The implementation of approved activities, along with any conditions, is regulated through a permit process under the *Land Use Planning and Approvals Act 1993*. Level 1 approved activities are deemed to pose the lowest level of risk to the environment.

This manual covers both construction and ongoing maintenance for small- to medium-scale coastal management activities (including those classified as Level 1 under EMPCA) undertaken by local government works crews, other government agencies, contractors, consultants and other parties.

Historic Cultural Heritage Act 1995

The *Historic Cultural Heritage Act 1995* provides protection of heritage with respect to places of archaeological, architectural, cultural, historical, scientific, social and technical significance.

Land Use Planning and Approvals Act 1993

The *Land Use Planning and Approvals Act 1993* (LUPAA) is the central Act within the RMPS. It provides the framework and key components for strategic and statutory land use planning and development. LUPAA requires that a local council planning scheme must aim to further the objectives of the RMPS, be consistent with any state policies, and have regard to the council strategic plan.

LUPAA provides for the creation, application and administration of planning schemes by planning authorities. Council planning schemes set out the requirements that apply to new land use and development. Planning controls on land use are applied in the form of zones and associated development controls.

The Tasmanian Planning Commission (formerly the Resource Planning and Development Commission, RPDC) is responsible for assessing planning schemes and planning-scheme amendments that are prepared by local planning authorities. Appeals against decisions made by local planning authorities are resolved through RMPAT.

Living Marine Resources Management Act 1995

The *Living Marine Resources Management Act 1995* promotes the sustainable management of living marine resources, provides for management plans relating to fish resources, and protects marine habitats. Living marine resources refers to all fish

species and other marine life including marine plants and vegetation such as seagrass and seaweed. It does not include whales or aquatic mammals or birds, or freshwater fish.

The Act applies to both commercial and recreational fisheries, as well as to aquaculture, marine reserves, marine pollution, release and importation of fish, diseases and pests, and other marine habitat-protection issues.

The Act and its regulations set minimum sizes of fish that can be taken; establish allowable fishing equipment and techniques, total allowable catches and bag limits for fisheries; give powers to fisheries officers, and allow for Fisheries Management Plans to be prepared.

National Parks and Reserves Management Act 2002

The *National Parks and Reserves Management Act 2002* provides for the management of national parks and other reserved lands. These include national parks, state reserves, nature reserves, game reserves, conservation areas, nature recreation areas, regional reserves, historic sites, private nature reserves and private sanctuaries. The Act sets out the values and purposes of each reserve class and how they should be managed according to management objectives for each class.

Nature Conservation Act 2002

The *Nature Conservation Act 2002* provides for the conservation and protection of the fauna, flora and geological diversity of Tasmania and for the declaration of national parks and other reserved land. The Act also provides for conservation covenants and reservation of private lands.

Schedule 1 sets out the different classes of reserved land, and outlines their values and the purpose for reservation.

Schedule 3a sets out a list of threatened native vegetation communities. In addition to individual threatened species, a number of threatened coastal vegetation communities are defined (e.g. riparian vegetation, wetlands, saltmarsh).

State Policies and Projects Act 1993

This Act deals with the making of Tasmanian Sustainable Development Policies, the integrated assessment of projects of state significance, the State of the Environment Reporting and for related purposes. The two state policies most relevant to the coastal zone are the *State Coastal Policy 1996* and the *State Policy on Water Quality Management 1997*.

State Coastal Policy 1996

The *State Coastal Policy 1996* has a central objective of sustainable development of the coastal zone. All activities, uses and developments that might impact on the coast are required to meet the objectives, principles and outcomes of the State Coastal Policy.

The policy has three main guiding principles:

- protection of natural and cultural values of the coast
- use and development of the coast in a sustainable manner
- integrated management and protection of the coastal zone is a shared responsibility.

The coastal zone is defined in the *State Coastal Policy 1996*, and revised in 2003 in accordance with the *State Coastal Policy Validation Act 2003*, as the area encompassing state waters and all land to a distance of 1km inland from the high water mark.

The main vehicles for implementing the State Coastal Policy are through land use planning controls, marine farming development plans, and local council strategic and operational plans.

Where there is a discrepancy between the State Policy and the provisions of a council planning scheme, the State Policy takes precedence.

A review of the *State Coastal Policy 1996* started in 2004, resulting in a proposed new *draft State Coastal Policy 2008*, which has yet to be formally adopted.

Until a new State Coastal Policy is gazetted, the *State Coastal Policy 1996* remains in force.

State Policy on Water Quality Management 1997

The central objective of the *State Policy on Water Quality Management 1997* is sustainable management of Tasmania's surface and groundwater resources, by protecting or enhancing their qualities while allowing for sustainable development.

Protected Environmental Values (PEVs), which describe the current uses and values of waterways, must be set for all Tasmanian surface waters, including estuarine and coastal waters. PEVs have been documented in a consultative process that involved all interested industry and community groups.

PEVs are useful in determining which key indicators should be monitored, and target levels for protecting or improving water quality for designated uses. In general, these values should be protected by implementation of best practice environmental management, and by compliance with emission limits set by the regulatory authority to minimise pollution of waterways.

Threatened Species Protection Act 1995

Threatened species are native species that are listed under state and federal legislation to receive special protection. Tasmanian species become listed under the *Threatened Species Protection Act 1995* due to restrictions in their abundance, range or habitat, or threatening processes likely to result in population reduction.

Management options to protect listed species include declaring areas of critical habitat, preparing and implementing recovery and threat-abatement plans, and instigating interim protection orders. Interim protection orders prevail over planning schemes, and can include the prohibition or regulation of any activity likely to affect the habitat adversely.

Weed Management Act 1999

The *Weed Management Act 1999* is the central legislation covering weed control and eradication in Tasmania. A core component is the legal process of declaring a weed species under the Act. Once declared, appropriate actions can then be taken against the plant species, including preparing a weed management plan. The legislation also addresses compliance requirements, and powers of inspectors appointed under the Act.

1.4.3 Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999

Activities that are likely to have an impact on matters of national environmental significance, for example listed threatened species and ecological communities, or listed migratory species, may also trigger an assessment under the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This assessment is conducted by the Australian Government, and the assessment is triggered by the referral of the matter to the Minister for the Environment.

1.5 Assessments and approvals

Before planning or undertaking works at any location, check who owns the land and what approvals and permissions are required. Works on public land, such as beaches, dunes and coastal reserves, will require the permission and approval of the land manager/

owner. This would generally be Crown Land Services (CLS), Parks and Wildlife Service (PWS) or the local council. For private land, permission of the landowner will be required.

Land below high water mark is generally Crown land; works there require approval under the *Crown Lands Act 1976*. There are also some Crown reserves extending up to 30m inland from high water mark. These are shown on the Tasmanian 1:25 000 scale topographic maps.

Councils and state agencies, such as PWS and CLS, can assist in identifying ownership of the land and the responsible land management authority. They can also

Table 1.1 Approval processes for coastal management activities

Councils	State government	Australian Government
Planning approval under the local planning scheme.	Approvals under the various state Acts detailed in section 1.4, such as <i>Aboriginal Relics Act 1975</i> , <i>Crown Lands Act 1976</i> , <i>Environmental Management and Pollution Control Act 1994</i> , <i>Land Use Planning and Approvals Act 1993</i> , <i>Living Marine Resources Management Act 1995</i> , <i>National Parks and Reserves Management Act 2002</i> , <i>Nature Conservation Act 2002</i> , <i>Threatened Species Protection Act 1995</i> , <i>Weed Management Act 1999</i> .	Compliance with <i>Environment Protection and Biodiversity Conservation Act 1999</i> may require approvals.
Building approval under the Building Code of Australia.	Each agency has different processes and requirements for approvals that they administer.	
The Engineering, Works and Parks and Recreation branches of local government are also required to obtain planning and building approvals from within their local governments.		

advise on the nature of any approvals required and how to go about lodging an application for approval.

Common approval processes are summarised in Table 1.1. Each land manager may also have requirements for certain formal assessments to be carried out so that values such as natural and cultural heritage and the potential impacts of a proposed activity are systematically considered.

Reserve Activity Assessment (RAA), Parks and Wildlife Service

The RAA system applies to all reserves managed under the Tasmanian *National Parks and Reserves Management Act 2002*. Depending on the nature and size of the proposed activity, an RAA assessment may be required for works undertaken in any reserves administered by PWS. The proposed activity will be assessed in order to minimise or reduce the potential for impacts on the reserve values. In some instances this may require input from specialists.

Aboriginal Heritage Assessment, Aboriginal Heritage Tasmania

Any development or works outside an existing development footprint should involve Aboriginal Heritage Tasmania at the beginning of the planning stage. It will advise if an Aboriginal heritage investigation or mitigation measures are needed to protect Aboriginal heritage. The level of investigation required will depend on the size and complexity of the project, the potential for Aboriginal sites to be present and what sites are already known in the area.

Crown Land Services Assessments, Department of Primary Industries, Parks, Water and Environment (DPIPWE)

Any activity occurring on Crown land requires

approval from Crown Land Services (CLS). Crown land may be sold, leased or made available for use under licence. It includes lands such as beaches, coastal and river reserves, public reserves, reserved roads, road verges, schools and hospitals. Coastal land or land adjoining inland waters will generally not be available for sale.

Formal application must be made to CLS to purchase the land or hold a lease or a licence over it. Application forms are found on the DPIPWE website.

A leaseholder has exclusive possession of the Crown land for a fixed term and pays rent. A licence does not provide for exclusive possession and is usually issued for access purposes or temporary short term use. Sale gives freehold title of the land upon payment of market value or an agreed price and is generally by public auction, tender or private treaty.

CLS assesses applications for land purchases and developments taking into account its merits, the management objectives for the land, and a public benefits test. Applications are considered by a Technical Advisory Group made up of government stakeholders with technical expertise across a number of areas, including environmental, European and Aboriginal heritage, and conservation. The public benefits test assesses the economic, social and environmental benefits of the proposal.

Environmental Impact Assessment (EIA), DPIPWE

The Environment Protection Authority Board's environmental impact assessment process applies to projects that are classified as Level 2 activities (under Schedule 2 of the *Environmental Management and Pollution Control Act 1994*), or other activities as determined by the Director of the Environment Protection Authority.

The scale and impact of the proposed activity determines whether an environmental impact assessment is required. Many of the activities covered in this Manual would be regarded as Level 1 activities, and therefore would not require a formal environmental impact assessment. These activities will, however, still require assessments of coastal values in order to minimise impacts on coastal environments and to abide by environmental legislation. Some of the more complex and larger activities, such as shoreline protection works, may be classified as Level 2 activities.

Threatened Species Assessment, Australian Government

The *Environment Protection and Biodiversity Conservation Act 1999* protects nationally listed threatened species by requiring activities or developments that are likely to have a significant impact upon a nationally listed threatened species to undergo a formal environmental impact assessment and approval process.

Additional assessments

If formal assessment processes are not deemed necessary it is still important to ensure that all natural and cultural values are identified before works commence.

Check with the Tasmanian Heritage Office and the heritage section of PWS for heritage values.

Search the Tasmanian Geoconservation Database at DPIPWWE for geoheritage sites.

Seek expert advice on wildlife and vegetation values from the DPIPWWE Biodiversity Conservation Branch and the Wildlife Management Branch.

Seek expert advice on coastal processes and coastal landforms from a coastal geomorphologist.

1.6 Working with contractors

In many circumstances contractors will be engaged to undertake works in coastal areas, such as fencing, earthmoving, vegetation management and weed control.

The qualifications and performance standards that need to be met will differ from one land manager to the next.

Contractors may not always be up to speed with latest best practice or have an understanding of the complex values and issues within the coastal environment. The guidelines throughout this manual will provide a benchmark for 'best practice' standards to expect from contractors.

Choose contractors with high environmental standards. Seek references or evidence of environmental credentials.

Provide clear environmental management targets in contract schedules. Works guidelines in this manual could be used as a basis for clauses in agreements with contractors.

A contractor who gets the job done in half the expected time might save money initially, but it could take a lot more time and money to fix problems that result from cutting corners or not following correct procedures.

1.7 Before work starts

This section deals with the importance of planning coastal management works and provides a step-by-step process for good management of work activities. Effective works on the coast require thorough planning and preparation, risk assessment and monitoring. Works must adhere to all relevant Australian and Tasmanian Acts, regulations, codes, strategies, and management plans.

Undertaking environmental management activities and construction works in coastal areas without adequate care could lead to environmental damage, which may be difficult and expensive to remediate. Works in the wrong place or completed incorrectly can soon be destroyed by natural coastal processes.

It makes sense to develop a works plan, obtain specialist advice, get the correct approvals, and notify or involve nearby residents and other interested people. It may be necessary to do cultural and natural heritage surveys before commencing works, to locate and identify values such as Aboriginal heritage, geoheritage, threatened species or vegetation of high conservation value.

Managing coastal environments is not an exact science and sometimes innovative methods may be more appropriate than traditional approaches. The guidelines in this manual do not rule out other approaches, as long as they are supported by specialist advice.

1.7.1 Things to consider

Works on unstable coastal landforms such as dunes, cliffs and beaches can increase erosion, which in extreme cases can lead to loss of structures (e.g. retaining walls) and danger to the public.

Coastal vegetation is important habitat and plays a role in stabilising foreshore areas. Some coastal vegetation communities are threatened or contain threatened species. Works should avoid impacts on threatened species, minimise damage to vegetation and implement rehabilitation where required.

Works on soft and sandy shorelines will be especially vulnerable to the increasing frequency of storm surges and rising sea level associated with global changes in climate.

Works should be appropriate for the site: soft' methods (e.g. revegetation) are preferable to 'hard' structures (e.g. seawalls) on the shoreline. Hard structures need engineering advice and require ongoing maintenance.

Acid sulfate soils in some areas can cause great damage to coastal structures and natural values if disturbed. Some areas have toxic sediments (e.g. heavy metals from mines or refineries) that may cause water pollution if disturbed.

Particular precautions are required with the use of machinery, particularly large machines such as excavators and bulldozers, on fragile and unstable coastal soils.

Machinery and equipment can transport weeds and diseases, and should be cleaned off-site before travel to the work site.

Commercial activities that rely on protecting natural ecosystems (e.g. fisheries and ecotourism) may be adversely affected by some works.

Some wildlife such as shorebirds, penguins and threatened species are extremely vulnerable to disturbance of their coastal habitat.

Works in coastal areas may disturb Aboriginal or other heritage sites and destroy cultural heritage values.

Consultation with the community is important to gain support for works and activities. Working with local organisations such as Coastcare groups is critical to ensure that proposed works will not impact on existing coastal management work being undertaken by volunteers.

1.7.2 Prepare a plan – six steps to effective coastal works

Planning is essential for all work activities to ensure works are undertaken effectively, efficiently, safely and with minimal impact on the environment. This section outlines how to plan effective coastal works.

Environmental management and construction projects require careful investigation and planning to ensure that the works:

- are effective in solving the environmental problem
- are appropriate for the specific site conditions (including impacts of sea level rise and climate change)
- are undertaken with minimal intervention at the site
- minimise damage to the environment
- maintain the integrity of ecosystems
- respect and protect Aboriginal heritage places and other heritage places
- involve the community through consultation and participation.

A works plan should be prepared before starting work, outlining the works to be done and who will do them, ensuring staff or contractors have appropriate skills and training for the job.

The plan should include a risk assessment detailing the measures that will be used to minimise the risk of causing environmental damage. It should specify the proposed methods and procedures and identify the materials, labour and costs, both for the works and for maintenance and ongoing monitoring.

Some key coastal issues to include in the plan

Identify sensitive vegetation communities and threatened species that might be affected by the works and need to be protected. A scientific survey may be needed.

Design works specifically for conditions at the site (e.g. direction of the prevailing wind/s, waves and movement of marine sediments) and interfere as little as possible with the coastal processes and ecosystems. Time activities to accommodate the tides and seasonal changes in winds, weather and storms. Consider seeking specialist advice on whether the proposed work methods, design and placement of structures are suitable for local conditions, especially on soft or sandy coasts. Consider and seek advice on the local, natural coastal processes.

Identify and avoid any potential impacts on wildlife and plan to reduce these impacts. Seek advice if working near sensitive wildlife habitat, such as shearwater rookeries or penguin colonies. Time activities to allow for seasonal breeding cycles for birds such as penguins and nesting shorebirds. Also consider providing for wildlife requirements (e.g. when revegetating an area, remember some shorebirds require bare patches to build their nest in the sand).

Protect Aboriginal and cultural heritage values. Ensure that these values are identified and any specifications for activities adhered to.

Work with the local community: in particular, it is important to collaborate with local environmental groups such as Coastcare groups.

Protect surface and groundwater quality. Take steps to minimise pollution and changes to the natural drainage patterns of the shore area.

Minimise construction and excavation on the seabed or shoreline. Manage it carefully under the advice of engineers and a coastal geomorphologist. Identify potential acid sulfate soils and toxic sediments.

Avoid introducing marine and terrestrial weeds, pests and diseases (e.g. on the wheels of vehicles, in mulch products and via boats), particularly phytophthora root rot (*Phytophthora cinnamomi*) and rice grass (*Spartina anglica*).

Plan for sea level rise by avoiding major works in highly vulnerable locations and factoring into the design and siting of coastal infrastructure the latest sea level rise predictions by the Intergovernmental Panel on Climate Change (IPCC). Coastal storms and storm wave surges are likely to occur more frequently in the future. This will remove sand from dunes, cause flooding in coastal areas and increase the salinity of coastal groundwater and freshwater wetlands (Sharples 2006; IPCC 2001).

Occupational health and safety (OH&S) and public safety are important when installing structures or providing facilities. Adhere to Australian Standards. Ensure that public safety, use and enjoyment are maintained. Provide adequate warning signs, fencing and other barriers while undertaking works that may endanger public safety. Provide safe, well-marked alternative access routes, if necessary, during works.

Protect aesthetic values. As far as possible, structures should be concentrated at certain locations to reduce the environmental and visual impacts (from near and distant views, from both land and water) on the general area.

The works program should include rehabilitation of the site, if necessary, and provide for regular follow-up to make sure the works are effective and in good repair. Schedule revegetation works for the most appropriate time of year for the best plant-survival rates.

Step 1 - Seek specialist advice

Good specialist advice can help to prevent or solve problems caused by constructions that are not properly sited or designed for the changing conditions on the coast. Inappropriate works can cause a range of issues including erosion or deposition of sand where it is not wanted.

Coastal geomorphologists have knowledge of managing coastal sands, soils and landforms such as dunes and cliffs.

A coastal engineer has experience in designing and constructing bridges, boating facilities and other structures to take account of tides, currents, sediment movement and other local coastal processes.

Other relevant specialists include Aboriginal Heritage Officers, biologists and ecologists.

Specialist advice is always important. In the following situations it is essential to seek specialist advice:

- a new hard engineering structure (e.g. a concrete wall) is proposed for a soft or sandy coastline
- the structure is large enough to trap sediment or change wave action (e.g. shoreline stabilisation techniques, groynes on sandy beaches, seawalls)
- an existing hard structure is creating ongoing problems (e.g. sand being trapped by a boat ramp).
- soft engineering techniques are being investigated and it is difficult to know which technique is most appropriate for the existing conditions (e.g. mesh or brush fences, and/or revegetation)
- there is a risk of disturbance to significant or threatened vegetation communities, flora or fauna, or cultural and Aboriginal heritage sites.

It is possible that minor upgrades to hard structures such as jetties and boat ramps will not require

specialist advice (e.g. resurfacing, or filling in holes at the end of boat ramps caused by boat propellers). However these works should be undertaken with great care and with consideration of coastal values. If values are disturbed or impacted by the work activity, specialist advice should be sought immediately.

Step 2 - Communicate, communicate, communicate

Make a communications plan. This includes notifying all neighbours and users likely to be affected by the works. The scale and type of activity will determine the level of community consultation required.

Identify the different values of all coastline users, not just local residents and regular visitors. This is important even for small-scale projects. One stretch of coastline may be used at different times for a variety of recreational and economic pursuits. Recognising the values and interests of the various people who use the area will help to identify and minimise conflicts between them.

Community consultation is important to inform people and gain public support for coastal works and developments that might affect public use and enjoyment of coastal areas. Consultation takes time and money, but it may prevent contractors and expensive equipment standing idle while a dispute brings work to a halt. Consider also the cost to future generations of doing the wrong thing.

Consult the local Coastcare group or other interested groups before undertaking major works to make sure the works do not interfere with their activities. Many public works (e.g. management of weeds, native vegetation and wildlife) require ongoing work and maintenance and will be more successful if they are joint projects carried out in partnership with the community. **Refer to section 4.2 Working with community.**

Step 3 - Undertake a risk assessment

Risk can be defined as the likelihood of an event occurring and the consequence if that event occurs. Risk assessment helps answer the questions:

- what is going to happen?
- how likely is it to happen?
- how vulnerable am I to it?
- how do I manage that?

Risk assessment enables land managers to deal with uncertainty through a step-by-step process to examine the current or potential environmental impacts of work activities and to deal with them before they become a problem. Environmental risk assessments follow the same basic principles as assessing a workplace for occupational health and safety (OH&S) risk.

The main stages of risk assessment:

- identify any environmental hazards associated with the proposed work
- assess the likelihood and potential environmental consequences of the hazards
- identify the environmental risk
- prioritise the risks to get an idea of which measures need the most attention (sometimes the small things are very significant)
- determine the control measures needed to prevent environmental harm, or to minimise impacts if something does occur – if no measures are available to bring risk within acceptable levels, then the project may need to be redesigned, or perhaps even halted
- review, apply and monitor environmental protection measures for effectiveness and ongoing maintenance.

Simplify risk assessment processes by linking coastal

and environmental risk assessments to existing OH&S risk assessments.

Step 4 - Seek approvals

Obtain permission from the land manager and/or landowner and all relevant authorisations for the works, to ensure that activities are undertaken appropriately and within the law.

Land tenure on the coast can be complex. If there is any doubt, land tenure can be identified through the Land Titles office at DPIPW. **Refer to section 1.5 Assessments and approvals.**

Step 5 - Supervise works

Ensure all works staff and contractors are briefed on minimising impacts on environmental and cultural values and provide adequate supervision to ensure best practice standards are being implemented.

Step 6 - Monitor and review

Monitor the effectiveness of the works plan during the course of activities and be prepared to respond to changed circumstances.

1.8 Monitoring and evaluation

Keeping records of the results of coastal management works will help to judge success and inform future decisions. The more details are gathered, the easier it will be to understand why something worked in one location and not in another.

This information will also improve opportunities for organisations to work in partnership with each other and to access external funds for projects, by demonstrating the need for funds or proving the ability of the organisation to undertake the works.

Ongoing monitoring will pick up any problems or changes early on and reduce the cost of mitigating or managing those problems.

Monitoring

Monitoring is the regular gathering of information in a consistent manner. It is a way to keep track of the condition of an area or asset.

Monitoring may include photographic records, water quality testing, beach profile measurements, visitor use statistics, asset condition assessments and habitat or natural value assessments.

A monitoring plan should specify the sites to be monitored, the procedures to be used, the timing or frequency of sampling or assessing and the format of reporting.

Evaluation

Evaluation is the systematic review of an activity or project. It indicates whether the activity has provided the result intended. Evaluation involves collecting and analysing information, often through monitoring and generating a report.

Evaluation enables information to be used to plan for future projects, review management methods and techniques, and determine the worth of a particular activity.

Tips for photographic records

Photographic records enable before-and-after comparisons and are very useful for monitoring impacts or outcomes of activities.

- Set up photopoints – mark the exact spot from which you take your first photo; over time, take subsequent photos from the same spot.
- Try to choose an angle that includes some distinguishing features in your photo.
- Aim to take photos at the same time of day and, as far as possible, with the same camera settings.

