

Part C

Current Management and Coastal Compendium: Trends in the Condition of Valued Coastline Assets

In this Part

- Existing management framework – roles and responsibilities of stakeholders
- Information about key Australian government, State government and Council policies and guidelines for the coastal zone
- Coastal landforms and processes
- Erosion and recession hazards on sandy coastlines
- Geotechnical hazards on cliffs and bluffs
- Baseline condition of coastal biodiversity
- Settlement and land use values of the coast
- The cultural landscape of the coast
- Level of risk associated with coastal hazards

15.0 Existing Management Framework

PART C documents the current management of the Wyong coastline and the current condition of the natural, cultural and built assets along the coastline.

Section 15.0 of **PART C** contains:

- More information about the organisations that have an interest and role in the management of the coastline. Included are the interests, roles and responsibilities of:
 - community stakeholders (**Section 15.2**)
 - local government (**Section 15.3**)
 - State government (**Section 15.4**)
 - Australian government (**Section 15.5**).

The interests of these groups and organisations are partly driven by land tenure (see **Section 15.1**) and partly by statutory responsibilities, as well as a commitment to being part of and supporting sustainable coastal communities.

- The statutory framework, policies, guidelines and management programs that constitute the current management of the coastline.
- Information about what various organisations are doing now and the ways in which management activities by various organisations are coordinated to maximise beneficial outcomes for the condition and enjoyment of the coastline.

This is the management baseline on which the Coastline Management Plan will build.

Section 16.0 of **PART C** provides background information about coastal landforms and coastal processes. Information about the character and condition of natural and cultural assets is in **Section 17.0**.

15.1 Land tenure

Figure 15.1 shows the main types of land tenure along the Wyong coastline:

- Private land
- Crown land (Crown Reserve)
- Council owned community land
- Crown land under the care and control of Council
- National Park or State Conservation Area
- Vacant Crown land subject to an Aboriginal Land Rights claim

Also shown in **Figure 15.1** is the coastal risk area as defined by coastal hazard studies (see **Section 16.4**), applying the sea level planning figures in the NSW Government sea level rise policy statement (DECCW 2009).



Legend

- 2050 Limit of Zone of Reduced Foundation Capacity
- 2100 Limit of Zone of Reduced Foundation Capacity
- Crown Land
- Freehold Land
- National Parks and Wildlife Services

FIGURE 15.1a

Land Tenure of Coastal Risk Areas
Shelly Beach



Legend

- 2050 Limit of Zone of Reduced Foundation Capacity
- 2100 Limit of Zone of Reduced Foundation Capacity
- Crown Land
- Freehold Land

FIGURE 15.1b

Land Tenure of Coastal Risk Areas
Toowoomba and Blue Bays



Source: SMEC (2010)

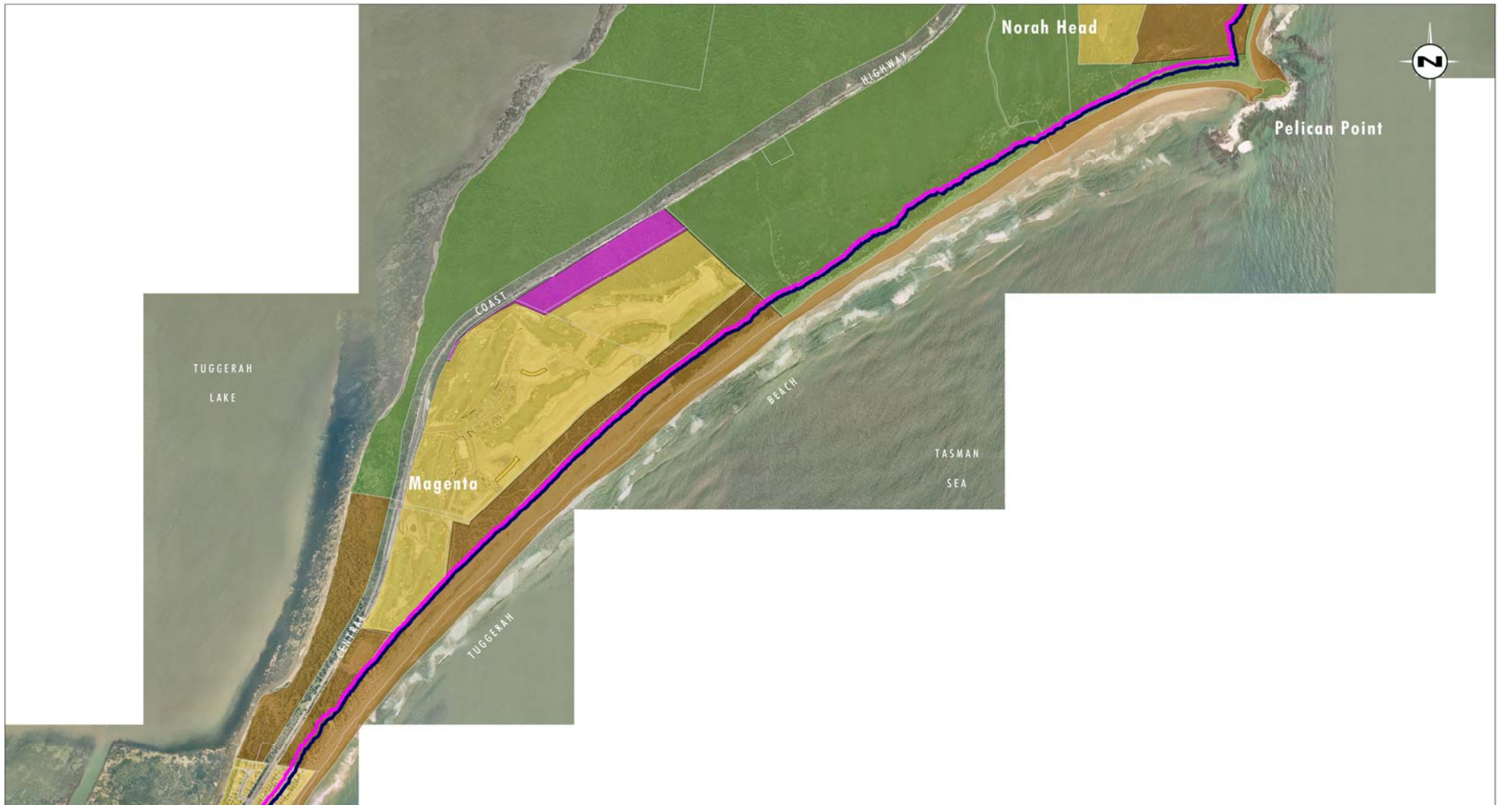
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Legend

- 2050 Limit of Zone of Reduced Foundation Capacity
- 2100 Limit of Zone of Reduced Foundation Capacity
- Crown Land
- Freehold Land
- Local Government Authority
- National Parks and Wildlife Services

FIGURE 15.1c

Land Tenure of Coastal Risk Areas
The North Entrance



Source: SMEC (2010)

0 0.5 1 1.25 km
1:25 000

Legend

- 2050 Limit of Zone of Reduced Foundation Capacity
- 2100 Limit of Zone of Reduced Foundation Capacity
- Crown Land
- Freehold Land
- National Parks and Wildlife Services
- Unknown

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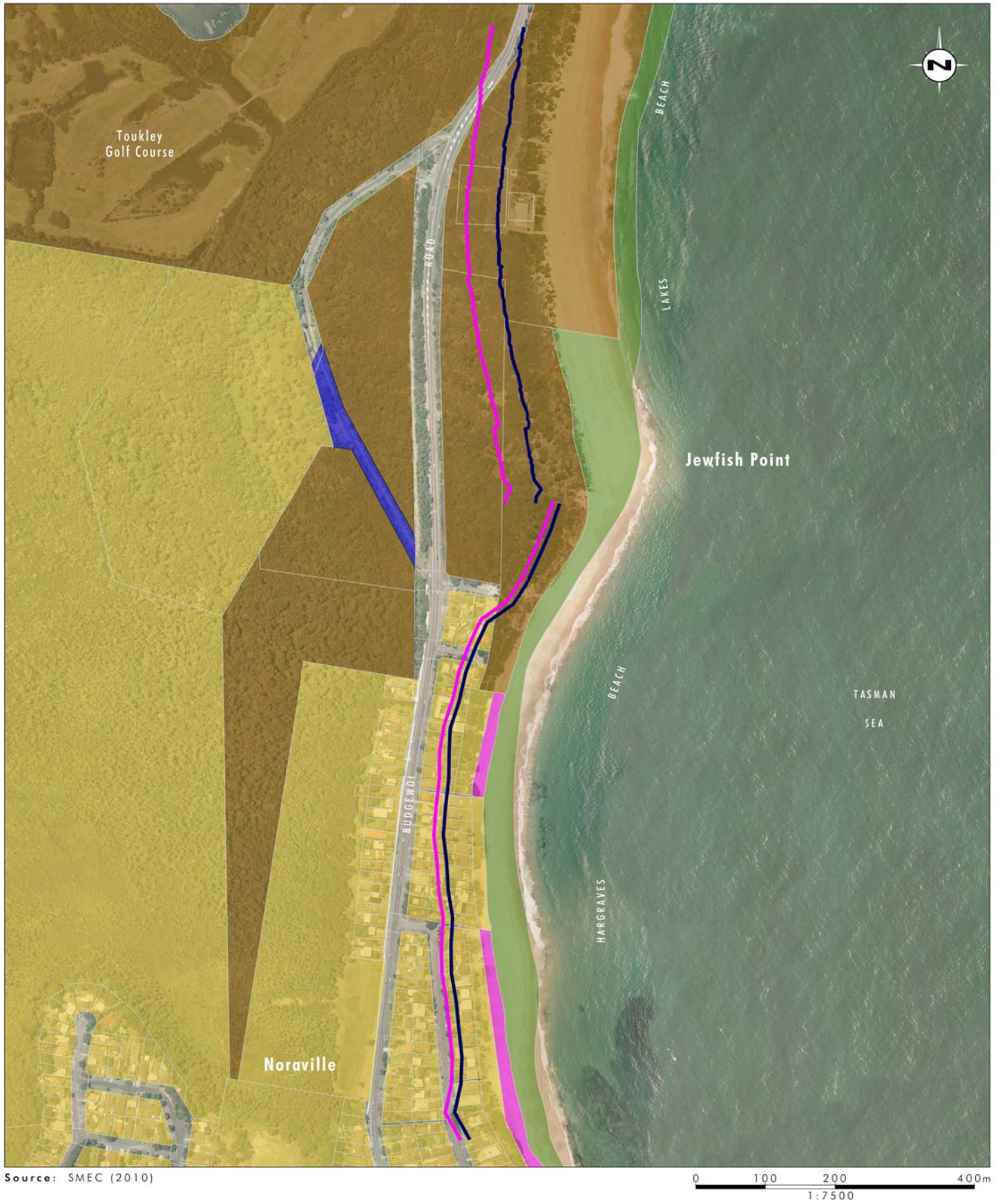
FIGURE 15.1d
Land Tenure of Coastal Risk Areas
The North Entrance



- Legend**
- 2050 Limit of Zone of Reduced Foundation Capacity
 - 2100 Limit of Zone of Reduced Foundation Capacity
 - Crown Land
 - Freehold Land
 - Local Government Authority
 - National Parks and Wildlife Services

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FIGURE 15.1e
Land Tenure of Coastal Risk Areas
Soldiers Beach



Legend

- 2050 Limit of Zone of Reduced Foundation Capacity
- 2100 Limit of Zone of Reduced Foundation Capacity
- Crown Land
- Freehold Land
- Local Government Authority
- National Parks and Wildlife Services
- Other

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FIGURE 15.1f
Land Tenure of Coastal Risk Areas
Hargraves and Lakes Beach



Source: SMEC (2010)

0 100 200 250m
1:5000

Legend

- 2050 Limit of Zone of Reduced Foundation Capacity
- 2100 Limit of Zone of Reduced Foundation Capacity
- Crown Land
- National Parks and Wildlife Services

FIGURE 15.1g

Land Tenure of Coastal Risk Areas
North of Lakes Beach

The figure shows that at several locations, predicted coastal recession for the 2050 and 2100 time frames will result in existing Crown land and Council land along the ocean foreshore being removed.

15.2 Community stakeholders, management activities and issues

Section 15.2.1 introduces some of the key community stakeholder groups that currently contribute to the management of the Wyong coastline.

Council provides regular consultation opportunities for many of the community interest groups through the Tuggerah Lakes Estuary and Coastline Management Committee (**Section 15.2.1.1**). **Sections 3.3.3, 3.3.4 and 3.3.5** in **PART A** outline the issues and options that have been raised by community stakeholders during the preparation of the WSCZMP.

15.2.1 Community stakeholder groups

15.2.1.1 Tuggerah Lakes Estuary and Coastline Management Committee

The Tuggerah Lakes Estuary, Coastline and Flood Risk Management Committee (TLEC&FMC) is a Committee of Council. The Committee meets monthly at Council and secretariat services for the Committee are provided by Council's Environment and Natural Resources Unit (see **Section 15.3.2**). The Committee provides a reference group for Council's management of the Tuggerah Lakes estuary and the Wyong coastline. Its agenda includes technical presentations on new coastal zone management tools relevant to the Wyong area and review and discussion of coastline and estuary planning documents prepared by Council or on behalf of Council.

The Committee membership includes:

- Councillors
- Council officers responsible for coast and estuary management
- State agency representatives, such as OEH, SES, DPI (relevant sections of the former L&PMA) and DTIRIS
- Representatives of community organisations with interest in the management of the coastal zone. This includes precinct committees from coastal residential areas, surf life saving clubs, volunteer coastal patrol and Landcare/Coastcare groups.

In relation to the preparation of the WSCZMP, the TLEC&FMC has considered project scope and costing issues, has received monthly updates on progress in preparing the hazard studies and management studies, has participated in open community meetings and has received briefings on key issues.

The TLEC&FMC has been briefed on and had an opportunity to review the draft of the coastal hazard studies (coastal erosion and geotechnical issues) and the draft WSCZMP, before they were formally presented to Council for approval to exhibit.

15.2.1.2 Landcare, Coastcare and the Central Coast Environment Network

There are 36 community groups under the Landcare/Bushcare/Coastcare umbrella across Wyong Shire. Six of these focus their activities on coastal areas, including those listed below, each listed with their stated key activities. Landcare and Coastcare groups are primarily interested in restoring natural dune vegetation, enhancing biodiversity and building the resilience of dune habitats.

- Bateau Bay Bushcare: bush regeneration and large scale tree planting. Central Coast Environment Network (CEN) has identified the Bateau Bay foreshore area and Flora Reserve as key components of ecological connectivity in their 'Stepping Stones' project. This project aims to improve connectivity between coastal and estuarine habitat areas, including the northern and southern sections of Wyrabalong National Park, by enhancing linkages in reserves along the Long Jetty lake shore and at Bateau Bay.
- Birdie Beach Dunecare: Regeneration of sand dunes and littoral rainforest
- Budgewoi Dunecare: The group's objective is to encourage involvement of the community in the restoration of the natural environment. Its projects have included beach access construction, bitou control, construction of dune forming fences and planting. Budgewoi Dunecare has prepared a detailed Action Plan (2010) for its current operations. The Dunecare group has worked in the Budgewoi area since 1996 and Dunecare volunteers have invested 41000 hours of their time in vegetation restoration and habitat enhancement works since then. Other significant achievements over the last 15 years include installation of constructed access ways to separate beach users from regenerating areas, establishing a propagation facility (with OEH) which has produced 35,000 endemic tube stock, and stabilising mobile dunes. The group reports that once rapidly transgressing dunes (at around 1.5 metres per year) are now fully stable. Budgewoi Dunecare has been awarded local and regional awards for natural heritage management. The group's area at Lakes Beach was chosen by OEH for the launch of the NSW Dunecare Manual.
- Coastcare T.E.N (The Entrance North): bitou control, construction of dune forming fences, planting
- Hargraves Beach Dunecare: Bitou bush control, construction of dune fencing, planting dune species, regeneration of littoral rainforest.
- Norah Head Coastcare Inc (also a residents and ratepayers organisation): bush regeneration, weeding, planting, coastal walk maintenance.

CEN and Wycare Inc. have broader interests but also do work and support other groups along the coast, including providing training and coordination. Wycare and CEN, together with HCRCMA, Lake Macquarie City Council, Gosford City Council and Wyong Shire Council are joint sponsors of the Central Coast Annual Landcare Forum, which provides networking and training opportunities for Landcare members from the region.

Wycare, Budgewoi Dunecare and CEN have received grants to carry out a range of on the ground activities to stabilise coastal landforms, remove nuisance weeds and improve the condition of the coastal ecological communities. Examples include:

- Budgewoi Dunecare received a grant of \$25,000 from the Australian Government Caring for our Country Program in the 2008 funding round for a dune rehabilitation project on a 13 hectare site at South Budgewoi. The dune had previously been degraded by rutile mining, sand extraction, weed invasion, and public access. Existing vegetation was predominantly Bitou Bush, with a small area of coastal sedge land. The funded works

included weed control, minor dune reshaping and the growing and planting of 5000 endemic seedling plants. The project also involved fencing of car parks, construction of pathways and new signage for beach users

- In the same funding round, CEN received a grant of \$37,000 for a broad coastal dune rehabilitation project, for multiple sites in Wyong and Gosford Council areas. The project included training/skill development for community volunteers, demonstration sites and on the ground works. It focused on enhancing the vegetation cover on coastal dunes to increase their resilience to a range of current and future threats, including recreation pressures and climate change.

15.2.1.3 Local Progress Associations, Precinct Committees and Ratepayers groups

Managing the interaction between coastal processes, private property, infrastructure and community services is a key interest of local community organisations, particularly as predicted long term coastal erosion is likely to impact on both the investments and lifestyles of coastal residents and ratepayers. Examples of impacts include loss of land and building assets, loss of insurance cover, loss of investment returns, and changes to access, views and amenity. Progress Associations and ratepayer groups are also interested in dune vegetation, management of beach access and recreation facilities along the coast.

Organisations with coastline interests include:

- Wyong Shire Residents and Ratepayers Association Inc.
- Budgewoi Precinct Committee
- Norah Head Residents and Ratepayers Organisation (and Coastcare)
- Lake Munmorah Progress Association
- The Entrance Community Precinct Committee

15.2.1.4 Surf Life Saving Clubs

There are six surf life saving clubs associated with patrolled beaches along the Wyong Council coastline:

- The Entrance
- North Entrance
- Toowoon Bay (established 1954)
- Lakes Beach (established 1953)
- Soldiers Beach (established 1953). Approximately 149,000 visitors now use Soldiers Beach each summer
- Shelly Beach

The locations of each of these beaches and clubs are shown in **Figure 1.1**.

Apart from providing lifeguard services at each of the six patrolled beaches on weekends and public holidays, the surf clubs contribute to environmental management on beaches and dunes and provide a venue for a wide range of community activities and values. These are discussed further in **Section 17.2.8**.

15.2.2 Previous community comments on coastal zone values, objectives and issues – related planning contexts

Several previous projects, conducted by State and local government, have engaged the community in discussion of issues in the coastal zone generally and specifically for Wyong Shire. Examples that are relevant to the WSC area include the NSW Government 'Who Cares about the Environment' surveys (see www.environment.nsw.gov.au) and Council's own wide ranging community engagement about the management of the Tuggerah Lakes. WSC has also consulted residents and visitors during the development of the planning strategy for The Entrance Peninsula area (2005-2009). Information about The Entrance Peninsula Strategy is included in **Appendix 5**.

Information about consultation during the preparation of the WSCZMP is in **Section 3.3** of **PART A**. Details of community information provided during the project are in **Appendix 1**.

15.3 Wyong Shire Council roles and responsibilities

Specific Council roles in aspects of coastline management are set out below. Council shares responsibilities for many of these roles with State agencies. Strong partnerships and close co-operation between all levels of government are essential for sustainable outcomes.

Table 15.1 shows Council's responsibilities in the coastal zone, the legislation and policy underpinning the responsibilities and how Council responds now. This section expands on the summary in **Section 3.0** of **PART A**. **Sections 15.2.1** to **15.2.4** provide more detail about key statutory and policy matters and further information is in **Appendix 5**. **Section 17.2** in **PART C** provides more information about the status and condition of coastal assets and values, resulting, in part, from the application of Council's past and current management policies, guidelines and decisions.

Table 15.1 - Council responsibilities in coastline management

Council roles and responsibilities	Legislation and policy requiring or guiding this responsibility	How Council meets this now
Coastal Hazards		
Emergency response during major erosive storm events and coastal inundation events. Council is responsible for coastal erosion mitigation works for protection of coastal property during storms.	NSW State Disaster Plan (State Emergency Management Committee 2009) <i>Coastal Protection Act 1979 (including recent amendments)</i> <i>State Emergency and Rescue Management Act 1989</i> <i>Local Government Act 1993</i> <i>Environmental Planning and Assessment Act 1979</i> (LEP and local development assessment) <i>Crown Lands Act 1989</i> Estuary Management Plan (Wyong Shire Council 2006) Coastal Zone Management Plan Flood Risk Management Plans Coastal Reserve (Foreshore) Plans of Management (e.g. Wyong Shire Council 1994) Emergency Management Plans for Coastal erosion hotspots (to be prepared by end December 2010)	Council is a member of the Local Emergency Management Committee, which has prepared a DISPLAN. The DISPLAN has several sub-plans, including one for flooding, for which SES is the lead combat agency. Council provides resources to assist the lead agency in emergencies and has an internal emergency response procedure. There is currently no emergency response sub-plan to address coastal erosion. Council's current emergency response to coastal erosion events is built on public safety as the first priority (removal of debris, fencing eroded scarps and unsafe beach access ways etc). In general, Council does not take action to reduce erosion to protect public or private property during storm events, although it has once used emergency sand emplacement when severe erosion threatened Council land and infrastructure at Karagi Point in The Entrance channel. Council supports dune management (encouraging accretion and revegetation) as a preventative measure to reduce coastal erosion impacts. Recent proposed amendments to the <i>Coastal Protection Act 1979</i> clarify council's obligations and opportunities in relation to emergency works (See Sections 15.3.4 and 15.4.4).
Notify land holders and occupiers of known coastal hazards	<i>Local Government Act 1993</i> <i>Coastal Protection Act 1979</i> <i>Environmental Planning and Assessment Act 1979</i> NSW Sea Level Rise Policy Statement (DECCW 2009)	DCP 77 is an interim development control measure to inform residents of coastal hazard threats and relevant planning requirements. s149 certificates of affected properties are annotated with respect to coastal hazards.
Minimise future risk by noting hazard constraints in the local planning system.	<i>Environmental Planning and Assessment Act 1979</i> NSW Coastal Planning Guidelines for Sea Level Rise (Department of Planning 2010)	DCP 77 refers to previous coastal hazard assessments, completed more than ten years ago. These hazard assessment have been updated with current environmental inputs as part of the Coastline Management Plan project.

Council roles and responsibilities	Legislation and policy requiring or guiding this responsibility	How Council meets this now
Manage erosion hazards that affect coastal foreshore reserves under Council's control	<i>Local Government Act 1993</i> <i>Crown Lands Act 1989</i> NSW Sea Level Rise Policy Statement (DECCW 2009) Coastal Reserve (Foreshore) Plans of Management (e.g. Wyong Shire Council 1994)	Remediation of access ways after major storms. Council currently places sand dredged from the entrance of the Tuggerah Lakes onto North Entrance beach, helping to build up a buffer of sand to protect reserves and private property during erosive storms.
Manage risks to Council infrastructure in the coastal zone, including, for instance, sewer and water lines, sea walls and steps/ramps.	<i>Local Government Act 1993</i> <i>Coastal Protection Act 1979</i> NSW Sea Level Rise Policy Statement (DECCW 2009)	Council has previously conducted hazard assessment in planning for the location of desalination plant Council has responsibility for the maintenance of sea walls at The Entrance. Council considers coastal hazards when planning the locations of pump stations and other sewerage infrastructure
Protect coastal urban communities and key habitats from bushfire hazards	<i>State Emergency and Rescue Management Act 1989</i> <i>Environmental Planning and Assessment Act 1979</i> and relevant bushfire assessment circulars <i>Rural Fires Act 1997</i>	Bushfire risk assessments are required for all new development whether on the coast or inland
Biodiversity		
Management of foreshore reserves, including Plans of Management and general maintenance activities	<i>Local Government Act 1993</i> <i>Crown Lands Act 1989</i> <i>National Parks and Wildlife Act 1974</i> <i>Threatened Species Conservation Act 1995</i>	Council has in place several generic Plans of Management for coastal reserves. These also address the heritage value of places in coastal reserves and the recreational value of these areas – both of which potentially have conservation and business aspects.
Land use planning and regulation for edge effects of private development along the coast, including tree preservation orders and planting policies.	<i>Environmental Planning and Assessment Act 1979</i> <i>Local Government Act 1993</i>	Council applies development consent conditions to new development. Council has prepared a range of guidelines, policies and regulations which are enforced.
Manage and support local Bushcare/Coastcare activities	<i>Linked to Catchment Management Act and the Catchment Action Plan (HCRCMA 2007)</i>	Council supports activities by Landcare groups working on coastal dunes, particularly where those activities contribute to the stability, scenic amenity and accessibility of the coastline.
Contribute to recovery programs for threatened species and Endangered Ecological Communities	<i>Threatened Species Conservation Act 1995</i> <i>Fisheries Management Act 1994</i>	WSC has mapped/ground truthed EECs along the coast and identified opportunities to promote the recovery of these communities, for instance, by encouraging Landcare activities and community awareness.

Council roles and responsibilities	Legislation and policy requiring or guiding this responsibility	How Council meets this now
Contribute to programs to protect the habitat of protected species such as migratory shorebirds that are covered by international conservation agreements	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Several species that are protected under international agreements visit the Wyong coastline. Council has worked with HCRCMA to identify important breeding and roosting areas.
Entrance management for Tuggerah Lakes as it affects estuary and marine ecology and water quality	<i>Local Government Act 1993</i> <i>Crown Lands Act 1989</i> <i>Fisheries Management Act 1994</i> Tuggerah Lakes Estuary Management Plan (Wyong Shire Council 2006)	Entrance management for Tuggerah Lakes is addressed principally in the Tuggerah Lakes Estuary Management Plan. However, entrance processes and entrance management such as dredging also interact with the management of the coastline. They affect sand supply to North Entrance Beach and The Entrance beach and patterns of scouring during storms.
Sustainable communities		
Land use planning Advice to landholders about coastal hazards that may affect their property	<i>Environmental Planning and Assessment Act 1979</i> <i>Local Government Act 1993</i> <i>Coastal Protection Act 1979</i> NSW Sea Level Rise Policy Statement (DECCW 2009)	LEP land use zoning for the coastline. Council has prepared a draft Climate Change policy (2010) which, amongst other things, sets out planning controls for coastal risk areas (sea level rise and other aspects), such as prohibited development within coastal hazard areas. Changes to Complying Development conditions within coastal hazard areas. DCP requirements for development applications within coastal hazard areas. Notations on s149 certificates about the spatial extent of coastal hazard impacts on coastal properties
Strategic land use planning to give effect to the Central Coast Regional Strategy and to minimise future risks by providing a framework for land uses compatible with coastal land capability and coastal hazards	<i>Environmental Planning and Assessment Act 1979</i> <i>Local Government Act 1993</i> <i>Coastal Protection Act 1979</i> NSW Sea Level Rise Policy Statement (DECCW 2009) NSW Coastal Planning Guidelines for Sea Level Rise (Department of Planning 2010)	Council has an existing LEP and multiple DCPs. It is preparing a new LEP which will be consistent with the Statewide template and will reference the most up to date coastal risk area information, in accordance with the DP&I coastal planning guidelines (2009)
Coastal access and amenity for diverse user groups. Manage beaches and reserves for the benefit of diverse users including disabled people and people wishing to exercise pets (social values of the coastline)	<i>Local Government Act 1993</i> <i>Companion Animals Management Act 1998</i>	Gazetted dog exercise areas at Lakes Beach, away from the surf club, North Shelly Beach and part of Bateau Bay Beach (see PART C, Section 17.2.7.1). Council manages many parks along the coastline. Locations are discussed in Section 17.2.7 .

Council roles and responsibilities	Legislation and policy requiring or guiding this responsibility	How Council meets this now
Provide recreational assets and facilities for beach users (e.g. surf club buildings and beach patrols)	<i>Local Government Act 1993</i>	Council maintains six surf club buildings along the Wyong coast (see Figures 1.1 and 15.1). These provide both beach patrol services and broader community services such as meeting and function rooms overlooking the coast.
Identify and protect significant cultural heritage items and places	<i>Heritage Act 1977</i> <i>National Parks and Wildlife Act 1974</i>	Places listed as having local or State heritage significance have been identified (see PART C, Section 17.3).
Provide information about coastal management to the local community and opportunities to be involved in on ground works	<i>Local Government Act 1993</i> <i>Catchment Management Act 1989</i>	Council has provided the local community with a large amount of information about the management of the estuarine/coastal lakes part of the coastal zone. It is working towards more detailed information for the community about coastal erosion hazards. Council will continue to support community involvement in on ground works along the coast, such as Landcare projects.
Plan for and encourage strong communities and sustainable economic development, including tourism	<i>Local Government Act 1993</i> NSW State Plan (NSW Government 2010)	These are important aspects of a sustainable coastal community and Council has identified these aspects in its sustainability policy (2009). See PART A, Section 2.0 and PART C, Sections 17.2.3 to 17.2.6 .
Implement sustainable resource use, including water, waste and energy.		The WSCMP is one of the tools to give effect to Council's sustainability policy (2009) and climate change policy (2010).
Foster a well informed community which has the capacity to act sustainably	<i>Local Government Act 1993</i>	Council's sustainability principles for the Shire are in PART A, Section 2.1 .
Manage and maintain assets and facilities for the community's enjoyment of the coast, including sea walls, ramps, steps, pathways etc.	<i>Local Government Act 1993</i>	Council has an asset register and maintains these assets after storms. Major community assets such as the sea wall at The Entrance are subject to more detailed assessment, planning and upgrade as necessary to maintain high levels of safety and amenity.

15.3.1 Existing Council planning instruments, policies, plans and guidelines for the coastline

WSC has a variety of statutory tools, policies and plans in use to manage the values of its coastline. Examples are listed below. Additional information about these policies and plans is in **Appendix 5**. Further information about past and current land use is in **Section 17.2**.

Council's current coastline management tools include:

- Zoning controls in the Wyong Local Environmental Plan (LEP), see **Section 15.3.2**.
- Development Control Plan 77 (1999 and as amended to 2005) (Wyong Shire Council 2005b) in relation to coastal hazards (see **Appendix 5**).
- Tuggerah Lakes Estuary Management Plan (Wyong Shire Council 2006). The ocean entrance of Tuggerah Lakes is located at the southern end of the long sandy Tuggerah Beach embayment and separates North Entrance Beach from The Entrance Beach. The interaction of the lake system with the ocean beaches is important in terms of coastal sediment budgets, the ecological health of the estuary and flooding risk around the estuary. **Section 16.4.3** discusses the implications of the entrance management policy for the adjacent beaches. **Section 16.7.1** discusses how coastal hazards associated with higher predicted sea levels over the next 40 years and 100 years will affect the behaviour of the entrance to the lake system. The potential for overtopping of the barrier at Budgewoi during storm events on a higher sea level base is also discussed. Proposed actions for managing the lake entrance area in relation to coastal processes are in **Section 10.0** in **PART B**.
- The Entrance Peninsula Planning Strategy (Wyong Shire Council & Dickson Rothschild Pty Ltd 2009) (see **Appendix 5**). The Entrance Peninsula includes The Entrance, North Entrance, Toowoona Bay and some lakeside suburbs. The strategy places a strong emphasis on the coastal character of The Entrance area, and in its central role in the development of the Shire's tourism and recreation economy. The Plan also recognises that not all ocean frontage land is suitable for development and the importance of planning controls to manage risk associated with coastal processes and climate change.
- Plans of Management for foreshore reserves – for recreation or for protection of natural values. Council lists 156 parks developed for public recreation in Wyong Shire. Coastal parks and facilities are listed in **Section 17.2.7**. Many parks contain recreation facilities such as picnic tables, seats, playground equipment, toilets, and community information about ecological or heritage values. A few parks are designated off lead dog exercise areas (see **Section 17.2.7.1**). Some parks and reserves provide valuable connecting coastal habitat as well as community recreation facilities. Information about the ecological values of coastal parks and reserves is included in **PART C, Section 17.1**.
- Council has a generic Plan of Management (PoM) for 'Natural Areas' (bushland) (Wyong Shire Council 2005), including a number of reserves along the coastline at Noraville and Shelly Beach. Section 15 of *PoM 10 – Natural Areas* presents specific guidelines for natural reserves in coastal locations. See also **Appendix 5**.
- DISPLAN and flooding subplan for emergency response (State Emergency Management Committee 2009). Council has also prepared an assessment of coastal emergencies associated with natural hazards in Wyong Shire (WSC and Eschelon 2007). This includes coastal natural hazards. Information about natural hazards and emergency response is noted in **Section 15.3.4** and **Section 8.0** of **PART A**. There are major amendments proposed to the *Coastal Protection Act 1979*, and several new guidelines, codes of practice and technical documents have been released in by OEHL in recent months.
- Sustainability Policy (2009). More information about the Sustainability Policy is in **Section 15.4.1** of **PART C**.
- Draft Climate Change Policy (2010). Information about Council's draft Climate Change Policy is in **Section 15.3.5**.

15.3.2 Land use zoning

Figure 15.2 shows the current zoning of the coast under the Wyong LEP, with coastal risk areas.

Zones currently applying to the Wyong coastline include the following:

- Zone 6 Open Space
- Zone 7 Environment Protection
- Zone 8 National Park
- Zone 2 Residential

Other than a short section of North Entrance Beach, the entire immediate ocean frontage is in open space, environment protection or national park zoning. However, the width of these zones in front of residential development is very narrow and many ocean front properties appear to have virtual tenure onto the back of the beach. As sea level rises and the frontal dune system begins to recede over coming decades, the narrow band of public land in front of residential development, at locations such as Hargraves Beach, Blue Bay and Toowoona Bay, as well as all of North Entrance, will disappear.

Council is currently preparing a new draft LEP, in accordance with the Statewide Standard Instrument template issued by DP&I. The new draft LEP will be completed in 2011.

The Standard Instrument introduces consistent zone names across all of NSW and is intended to simplify interpretation of LEPs. Further information about proposed zones in Wyong can be obtained from Council and from DP&I.

Zones under consideration for the Wyong coastline or its local context include the following:

- A1 General Residential
- A2 Low Density Residential
- A3 Medium Density Residential
- A4 High Density Residential
- A5 Large Lot Residential
- SA2 Infrastructure
- SA3 Tourist
- RA1 Public Recreation
- RA2 Private Recreation
- A1 National Parks and Nature Reserves
- A2 Environmental Conservation
- A3 Environmental Management



Source: SMEC (2010)

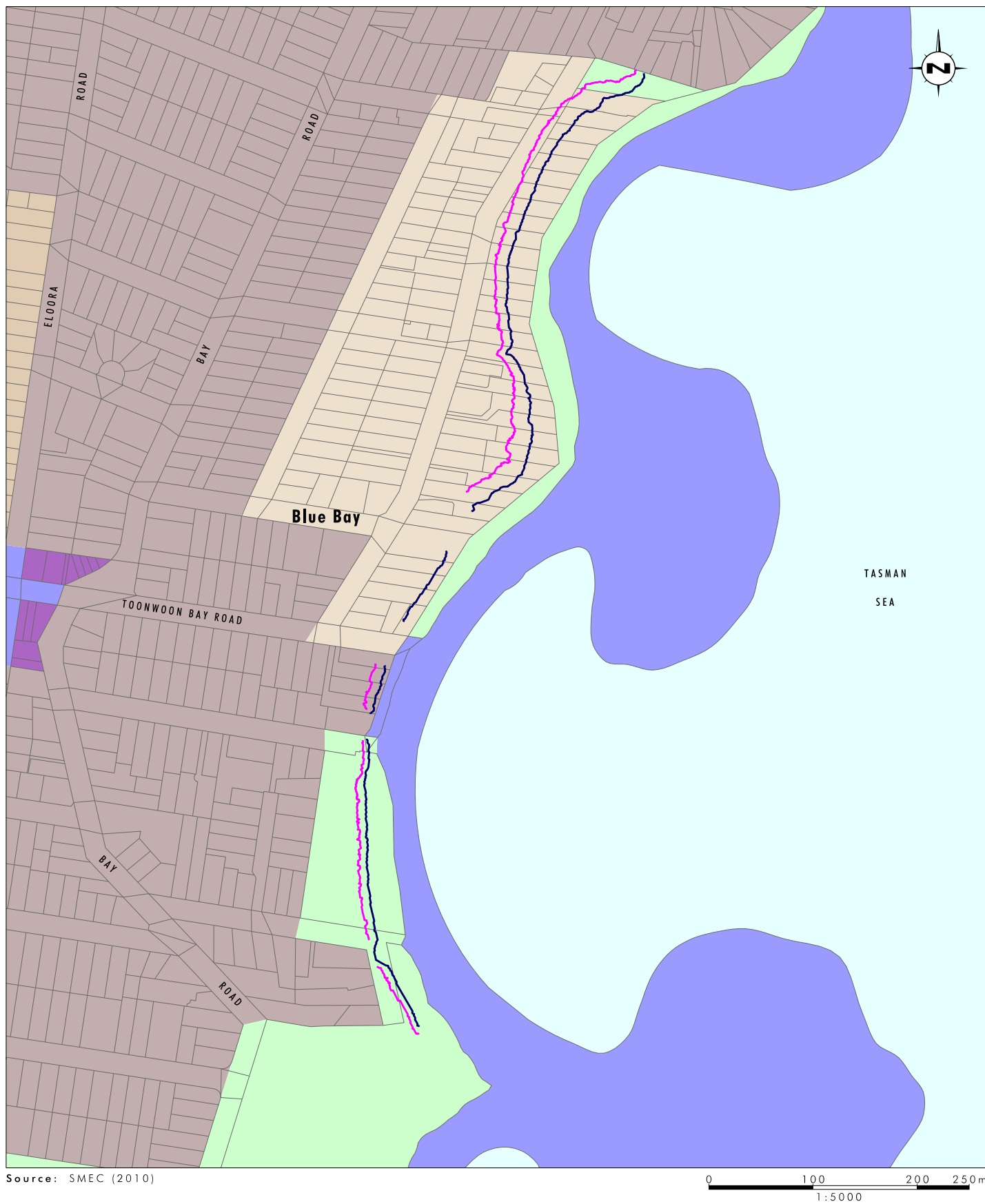
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Legend

- 2100 Limit of Zone of Wave Impact and Slope Adjustment
- 2100 Limit of Zone of Reduced Foundation Capacity
- Zone 2a Residential
- Zone 2b Multiple Dwelling Residential
- Zone 3a Business Centre
- Zone 3b Centre Support
- Zone 5c Local Road Reservation
- Zone 6a Open Space and Recreation
- Zone 7d Coastal Lands Protection
- Zone 7e Coastal Lands Acquisition
- Zone 8a National Parks
- Unzoned
- Water

FIGURE 15.2a

Land Use Zoning
Shelly Beach

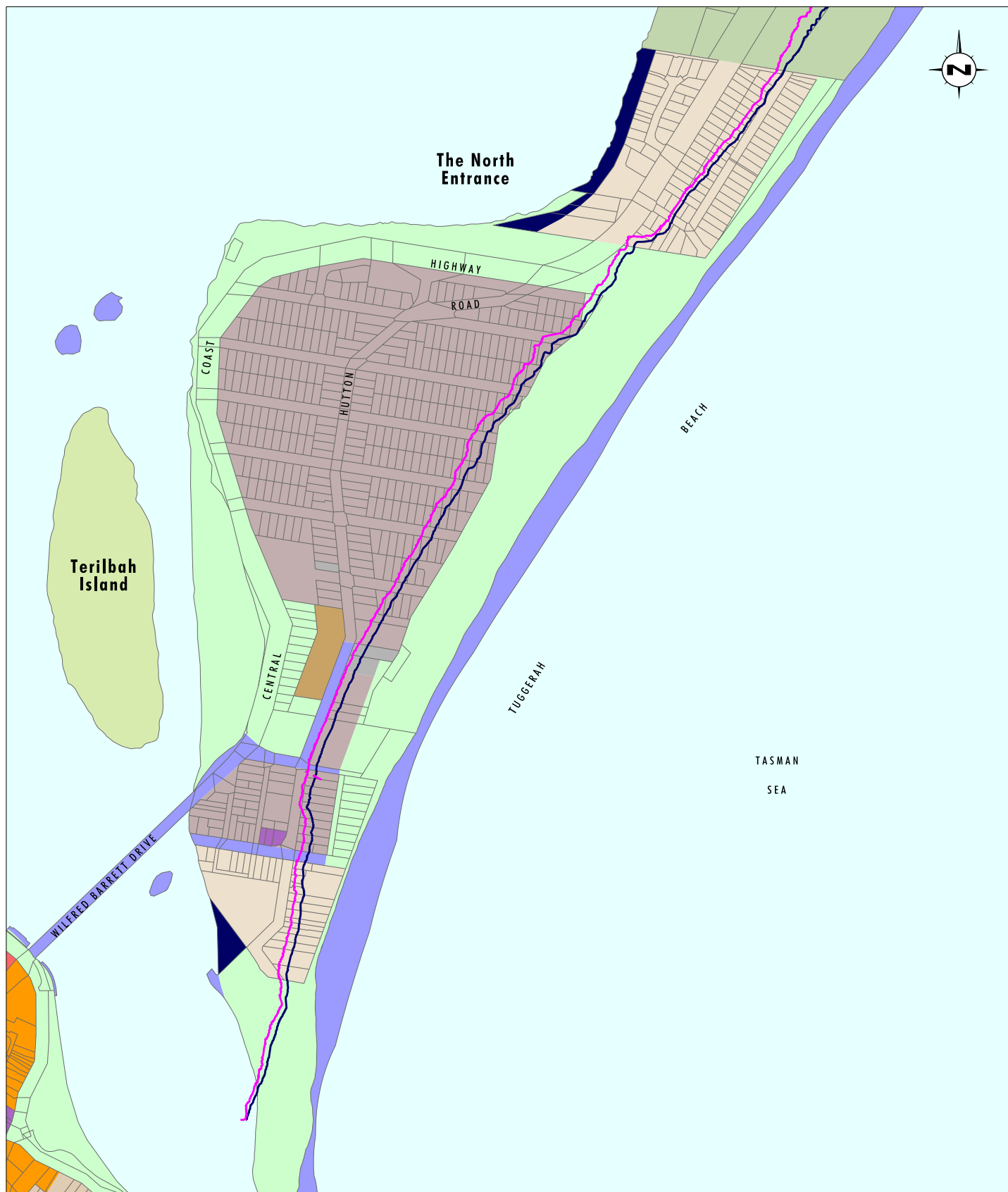


Legend

- 2100 Limit of Zone of Wave Impact and Slope Adjustment
- 2100 Limit of Zone of Reduced Foundation Capacity
- Zone 2a Residential
- Zone 2b Multiple Dwelling Residential
- Zone 2c Medium Density Residential
- Zone 3a Business Centre
- Zone 6a Open Space and Recreation
- Unzoned
- Water

File Name (A4): R03_V1/1869_122.dgn

FIGURE 15.2b
Land Use Zoning
Toowoona and Blue Bays



Source: SMEC (2010)

0 100 250 500m
1:10 000

Legend

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|--|--|---------|
| — 2100 Limit of Zone of Wave Impact and Slope Adjustment | Zone 3a Business Centre | Unzoned |
| — 2100 Limit of Zone of Reduced Foundation Capacity | Zone 3d Tourist Business | Water |
| Zone 2a Residential | Zone 5a Special Uses | |
| Zone 2b Multiple Dwelling Residential | Zone 6a Open Space and Recreation | |
| Zone 2c Medium Density Residential | Zone 6c Proposed Open Space and Recreation | |
| Zone 2d High Density Residential | Zone 7a Conservation | |
| Zone 2g Residential Tourist | Zone 8a National Parks | |

FIGURE 15.2c
Land Use Zoning
The North Entrance



Source: SMEC (2010)

0 0,5 1 1,25 km
1:25 000

Legend

- 2100 Limit of Zone of Wave Impact and Slope Adjustment
- 2100 Limit of Zone of Reduced Foundation Capacity
- Zone 2a Residential
- Zone 5a Special Uses
- Zone 6a Open Space and Recreation
- Zone 6c Proposed Open Space and Recreation
- Zone 7a Conservation
- Zone 8a National Parks
- Unzoned
- Water

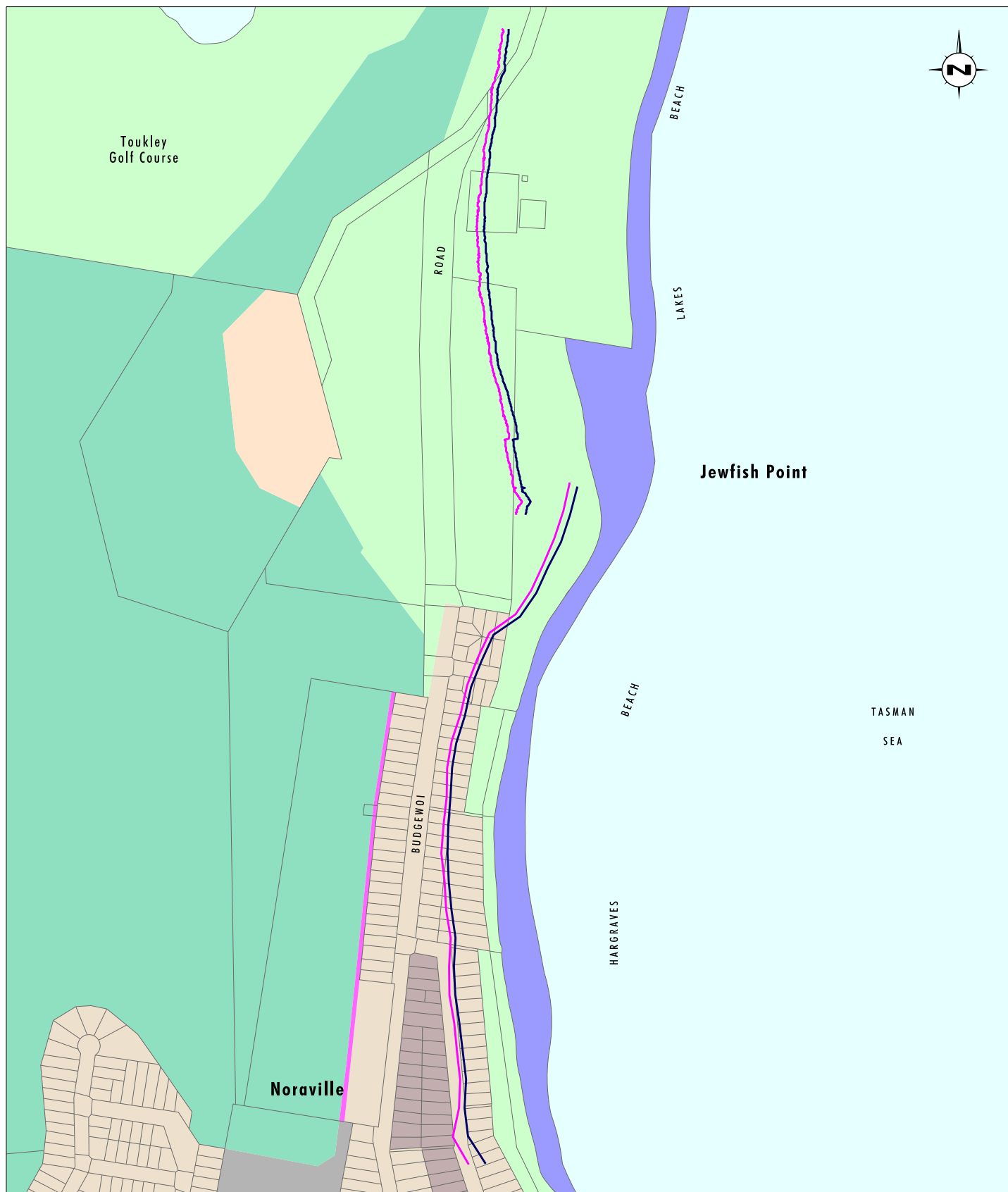
File Name (A4): R03_V1/1869_124.dgn

FIGURE 15.2d
Land Use Zoning
The North Entrance



Legend

- 2100 Limit of Zone of Wave Impact and Slope Adjustment
- 2100 Limit of Zone of Reduced Foundation Capacity
- Zone 6a Open Space and Recreation
- Zone 7a Conservation
- Zone 8a National Parks
- Unzoned
- Water



Source: SMEC (2010)

0 100 200 400 m
1:7500

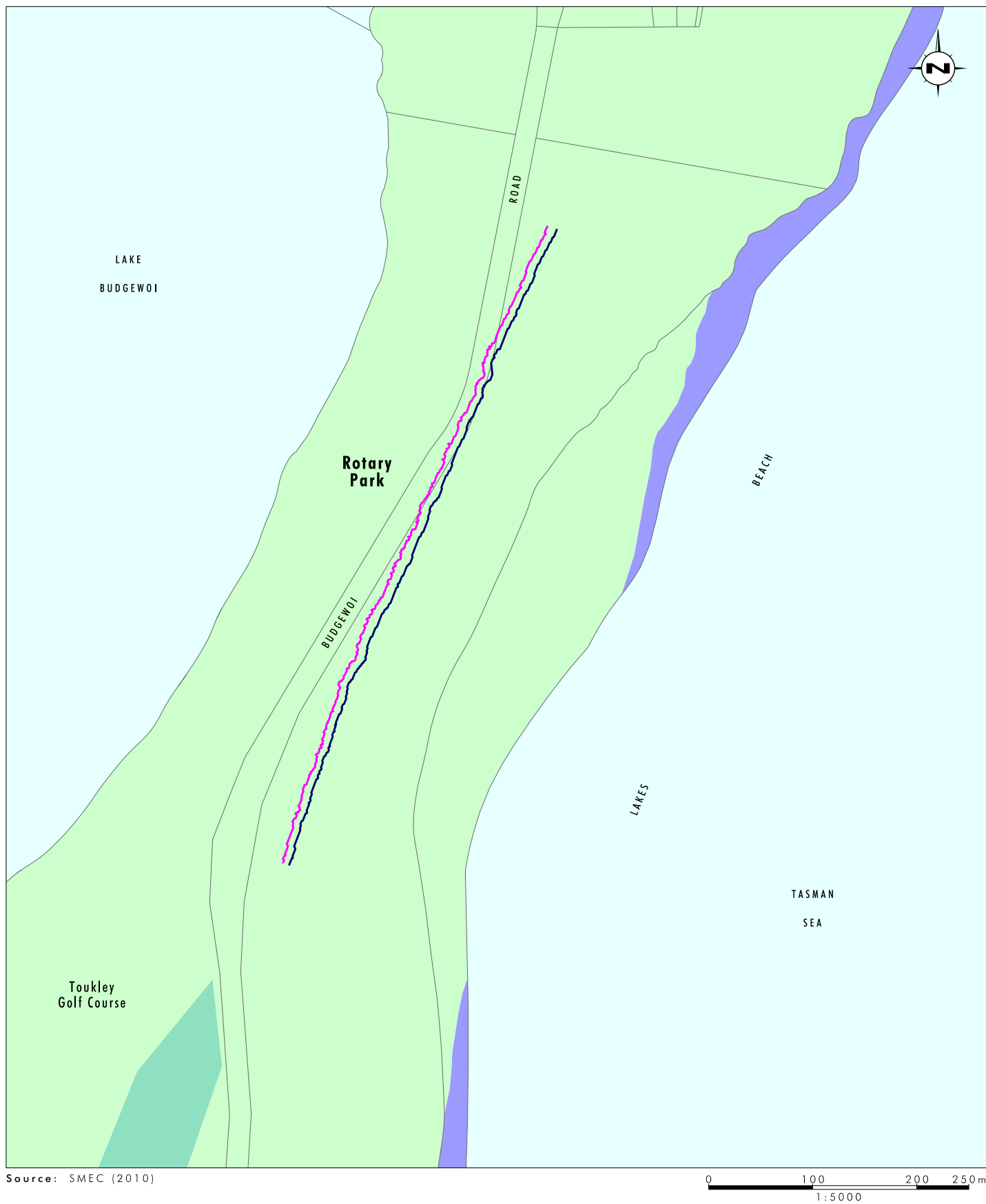
Legend

- 2100 Limit of Zone of Wave Impact and Slope Adjustment
- 2100 Limit of Zone of Reduced Foundation Capacity
- Zone 1c Non-Urban Constrained Land
- Zone 2a Residential
- Zone 2b Multiple Dwelling Residential
- Zone 5a Special Uses
- Zone 6a Open Space and Recreation
- Zone 7b Scenic Protection
- Zone 7g Wetlands Management
- Unzoned
- Water

File Name (A4): R03_V1/1869_126.dgn

FIGURE 15.2f

**Land Use Zoning
Hargraves and Lakes Beach**



Legend

- 2100 Limit of Zone of Wave Impact and Slope Adjustment
- 2100 Limit of Zone of Reduced Foundation Capacity
- Zone 6a Open Space and Recreation
- Zone 7g Wetlands Management
- Unzoned
- Water

FIGURE 15.2g
Land Use Zoning
North of Lakes Beach

- A4 Environmental Living
- A1 Natural Waterways
- A2 Recreational Waterways

Council will link zones and related planning controls for the coastal zone to the coastal hazard assessment. Details of potential approaches to coastal land use in coastal erosion hazard areas are in **PART B, Section 9.0**.

Council's intention in preparing the new LEP is to manage land use in the coastal zone so that the intensity of use in coastal risk areas decreases over time. This is in accordance with Principle 4 of the DoP Guideline (2010) (see **Section 15.5**).

15.4 Sustainability is a key part of Wyong Council's Strategic Vision

15.4.1 Sustainability research on the Central Coast

In 2006, Gosford and Wyong Councils commissioned CSIRO Sustainable Ecosystems to establish a framework for enhancing the quality of life and sustainability of Central Coast residents (CSIRO Sustainable Ecosystems 2007). A number of the issues considered in this sustainability study are relevant to the future management of the coastline. The project involved extensive interviews and workshops with Council staff and with 75 residents in focus groups. Discussion focused on four key aspects of quality of life for the Central Coast – commuting, life-long learning, sense of community and climate change. The climate change discussion paid particular attention to water supply as this consultation occurred during unprecedented water restrictions for the Central Coast; however, rising sea level was also a source of concern. Participants also considered seven main 'domains' of quality of life, which derive from previous research on community perceptions of well being. These are standard of living, health, achievements in life, personal relationships, feelings of safety, community connectedness and future security.

Interestingly, concepts of the environment, such as naturalness or environmental condition, or access to bushland or beaches are not included as specific well being domains. In this research, the state of the environment is broadly included under future security – particularly with regard to uncertainty about what climate change may mean for the condition and productivity of the local environment.

From the interview and consultation process, it was clear that Central Coast residents do consider the natural and built environment and access to open space as key influences on well being and sustainability. Participants stated that a good balance between the built and natural (bush, beaches etc) components of the environment was needed for quality of life (short term) and sustainability (long term).

A lack of information and leadership on climate change was noted as an important detrimental factor for climate change, driving pessimism and fear about the future environment.

15.4.2 WSC Strategic Vision

Wyong Council released *Our Shire Our Future*, a Strategic Vision document, in 2009 after extensive consultation (Wyong Shire Council 2009). The document makes it clear that the coastline is viewed by the local community as a key asset that attracts them to the Wyong Shire area. Sustainability is an important part of the Strategic Vision, incorporating environmental, social and economic values.

Council has prepared six draft Sustainability Principles, which will guide Council's work, including:

- Successfully integrate economic, social and environmental outcomes
- Protect the environment to maintain healthy ecological systems
- Build partnerships by engaging and listening to the community
- Lead by example and support actions for sustainability

Council intends that the preparation and implementation of the WSCMP will be consistent with these principles.

Council has also identified eight key sustainability objectives and in broad terms discusses how these objectives will be delivered. Direct and indirect references to the coastline or coastline values include those listed in **Box 15.1**.

Box 15.1 - Wyong Shire Council and Sustainable Management of the coastline

PROTECT NATURAL VALUES

Areas of natural value in public and private ownership will be enhanced and retained to a high level in the context of ongoing development.

This will be achieved by (amongst other things):

- Preserving threatened and endangered species, as well as ecological communities and biodiversity (on the coastline and elsewhere)
- Expanding and continuing programs focused on restoring degraded natural areas in our community (on the coastline and elsewhere)
- Developing and implementing a natural resources sustainability strategy for the Shire (note that Council's draft Climate Change Policy (2010) and this Coastline Management Plan will feed into the natural resources sustainability strategy)

ENGAGE THE COMMUNITY IN ENVIRONMENTAL ISSUES AND MANAGEMENT

There will be a sense of community ownership of the natural environment through direct public involvement in environmental programs

This will be achieved by (amongst other things):

- Creating and promoting a network of renowned natural trails, for instance, a world class 'Beach and Cliff Walk' and a 'Mountains to the Sea' trail.
- Establishing an annual 'Celebration of our Environment' event based around our lakes and beaches
- Actively supporting and encouraging volunteer environmental champions

AN AWARE AND KNOWLEDGEABLE COMMUNITY

The community will be well educated, innovative and creative. People will attain full knowledge potential at all stages of life.

This will be achieved by (amongst other things):

- Establishing and maintaining a committed network of education, community, business and government representatives on values including the natural environment (including the coastline).

Lower level, related objectives, which are directly relevant to the management of climate change issues along the Wyong coastline, are:

A high level of information about the natural environment and environmental change will be maintained and available.

Community knowledge of sustainability and environmental issues impacting on Wyong Shire will be comprehensive

The Coastline Management Plan and follow up actions will assist Council to deliver on these objectives.

15.4.3 Council structure for delivering sustainable coastline management

Responsibility for managing coastline values and assets sustainably lies with many different sections of Council. Major roles for coastline management are managed by the Shire Planning section.

Table 15.2 shows the various components of Shire Planning and also shows the other Council sections whose activities influence or are influenced by coastal processes and hazards.

Table 15.2 - Shire Planning and managing coastline issues

Environment and Planning Services Department	Examples of roles: All of these roles have a coastline management element
	Overall positioning of Council's activities, Council leadership and community engagement
Environment and Natural Resources	Shire ecology, coastal ecological resilience, stream health, soil condition. Implement the Estuary Management Plan; climate change policy; manage coastal processes; sustainability policy
Development assessment, Land use planning and policy development	Strategic land use planning (LEP, DCP) and development assessment – how Council will determine DAs in coastal risk areas
Regulation and Compliance, building certification and health	Building services; decisions about forced relocation of buildings
Place management	Master Plans and Plans of Management for high profile, high usage coastal reserves
Corporate Services Department	Communication with rate payers and customer service; Council strategic obligations
Corporate governance	Transparent decision making processes and community access to information about the coast
Finance	Allocation of budget to coastal zone management actions

Environment and Planning Services Department	Examples of roles: All of these roles have a coastline management element
Information management	Management systems for records of coastal condition and for other review, assessment and reporting strategies
Economic and property development	Evaluation of economic risks to the Shire of management decisions about coastal property in immediate and short to medium term coastal risk areas
Integrated planning	Strategic land use decisions for the Shire
Community and Recreation Services Department	
Open Space, sport, leisure and Recreation	Foreshore reserves and other parks, and their use
Community and cultural Development	Community well being and respect for diverse cultural attachment to the coast
Community engagement	Community information and opportunities to contribute to issue management and decision making
Community buildings	Includes surf clubs
Infrastructure Management Department	
Roads and stormwater	Manage drainage to not enhance geotechnical hazards or reduce water quality; protection of road assets affected by sea level rise and coastal recession
Design and Project management	Special projects, including in coastal risk areas
Asset Management	General asset maintenance, including in coastal risk areas – this would include beach access ways and viewing platforms
Waste, water and sewerage	Relocation of water supply and sewerage assets that are in coastal risk areas – scheduling in relation to timeframe for risk.
Plant, fleet and depots	Ensuring plant is available and crew trained for managing coastal emergencies
General Manager's Department	
Legal and risk service	Assessing risk to Council associated with coastal process hazards, including climate change
Major projects	Coastal projects requiring major council investment or with high risk

15.4.4 Natural hazards and coastal emergencies

WSC shares responsibility for planning, preparation and response to coastal emergencies with SES and OEH.

Further information about the definition of coastal emergencies and council's existing assessment of a range of emergencies arising from natural hazards is included in **Table 15.3** (below). Council's proposed strategy for future management of coastal emergencies is in **Section 8.0** of **PART B**.

Further information about options that have been considered in relation to management of coastal emergencies is in **PART D**.

15.4.4.1 Previous assessments of natural hazards and coastal emergencies, Wyong Shire

WSC prepared a draft Emergency Risk Management Report in 2007 (WSC and Echelon 2007). **Table 15.3** summarises the results of the risk assessment for a range of hazards affecting coastal development and people. The risk assessment considered impacts on people, property, animals and the environment. The assessment is based on **current** hazards – as they were understood prior to the completion of the hazard assessments for this Coastline Management Plan and it does not appear to take longer term climate change hazards into account.

As shown in **Section 16.0**, more homes or community assets are now understood to be located in the immediate coastal erosion hazard zone, and the number of affected properties and structures is predicted to increase significantly by 2050, with sea level rise at the NSW planning bench mark. Risks, as understood with recent studies, and as modified by predicted sea level rise and other aspects of climate change are discussed in **PART C Section 18.0**.

Table 15.3 - WSC emergency risk management – coastal (from Wyong LGA Local Emergency Management Committee & Echelon 2007)

NOTE: this assessment predates the coastal hazard assessments completed for the Coastline Management Plan

Hazard	Risk assessment	Explanation	Who leads emergency management actions
This hazard relates to the Tuggerah Lakes and creek lines more than the open coast. A 1 per cent AEP flood could result in inundation of properties and possible evacuation of up to 10,000 people, infrastructure damage, displacement of livestock etc.	High	Severe floods known to have occurred in 1949, 1964, 1990 and 1992. Refers to multiple flood studies and flood risk plans for creeks and Tuggerah Lakes. Notes need to develop an evacuation plan for large scale evacuations. A related risk is failure of infrastructure such as the sewer system, because of inundation of pumping stations and reticulation system, loss of power.	SES
A tsunami could result in possible human fatalities and injuries, damage to property, infrastructure and the environment. Evacuations of coastal and urban community.	High	Thirty tsunami (New South Wales State Emergency Service 2006) have been experienced on the NSW coast over the last 200 years, mostly with very small effects that have barely been noticeable. No loss of life or major damage has been noted. The largest tsunami (a 1 metre tidal fluctuation at Fort Denison) occurred in 1960. Financial, resources and operational management consequences rated as catastrophic.	SES

Hazard	Risk assessment	Explanation	Who leads emergency management actions
Storm surge could result in possible human injuries, damage to the environment, property and infrastructure	High	Major consequences for evacuation, community services and financial resources identified. Resources consequence identified as catastrophic. Impacts are similar to flooding, although source is oceanic waters rather than catchment runoff.	SES
Coastal storm- severe coastal erosion resulting in damage to property and evacuation of up to 150 people (North Entrance)	Low	Severe coastal storms known to have occurred in 1945, 1974, 1978, 1984-86 and also 2007 (after this draft report was prepared), with severe damage to only a few properties on each occasion. Environmental, resources and operational management consequences identified as moderate. Most consequences rated minor or insignificant.	SES
Prolonged heavy rain may lead to landslip at Norah Head, with damage to property, environment and utilities. Up to 50 people affected with possible evacuations.	Low	Ongoing history of landslip, linked to local geology and groundwater conditions. Localised landslips can occur suddenly. Environmental and financial consequences rated as major. Other consequences minor or insignificant.	LEOCON

15.4.5 Wyong Shire Climate Change Policy

Council's Environment and Natural Resources Unit prepared a draft Climate Change Policy for the Shire in 2009 (Wyong Shire Council 2010). Whilst the draft Policy has been available on Council's web site, it is not currently adopted by Council as a formal policy.

The document provides a summary of the scope of potential climate change impacts on the Shire and on Council's responsibilities and activities. The draft policy has six objectives, which focus on improving Council and community understanding of climate change issues as they affect the local area, formal adoption of climate change projections to provide certainty (i.e. clear standards and benchmarks) in planning for Council and landholders, and measures to reduce both Council's carbon footprint and the vulnerability of the hire to climate change consequences.

In relation to the coastline and estuary, the draft Policy adopts the current (2009) NSW government sea level rise planning benchmarks and technical guidelines, but also considers how asset life can be used in conjunction with sea level rise projections to guide appropriate development and minimise risk.

15.5 Roles, responsibilities and requirements of the NSW Government

NSW Government roles, responsibilities and requirements for coastline management are established in the legislation and policy identified in **Table 15.4** (by agency). The NSW government's overall strategic direction, priorities and targets which affect the condition of the coastline's natural resources and the capacity of communities to manage coastal natural resources/assets effectively for social and economic benefits, are set out in Priority A4 of the State Plan (see **Appendix 5**) and also noted in **Section 1.3.4** of **PART A**.

The framework for land management along the coast is basically set within the statutory and policy framework of four agencies:

- Department of Environment, Climate Change and Water
- Department of Planning
- Land and Property Management Authority
- I&I NSW (Fisheries) for aquatic/marine habitats

Other agencies listed in **Table 15.4** have responsibilities for specific issues or for marine matters which are outside the local government area, but which may affect the way that Council manages land within the local government area.

Additional information about a range of NSW Government legislation, policies, plans and programs that affect the management of the Wyong coastline is in **Appendix 5**. Information about the most recent policy and guidelines that are the core of the current approach to managing coastal hazards is in **Sections 15.4.2** to **15.4.5**.

Table 15.4 - NSW Government responsibilities in the coastal zone

Agency/organisation	Legislation, Policy and Plans	Responsibilities
Land and Property Management Authority (L&PMA)	<p><i>Crown Lands Act 1989</i> The sea bed to 3 nautical miles offshore is Crown land. The bed of estuaries is also Crown land.</p> <p><i>Soil Conservation Act 1938, Roads Act 1993, Public Reserves Management Fund Act 1987; Native Title (NSW) Act 1994. Aboriginal Land Rights Act 1983.</i></p> <p>Plans of Management for Crown Reserves and Management Plans for Regional Crown Reserves. (Department of Lands n.d.).</p> <p>Plans of Management for State Parks (Department of Lands n.d.)</p>	<p>Management of Crown Reserves, including Norah Head Lighthouse reserve</p> <p>Maintenance of facilities for minor ports and harbour foreshores.</p> <p>Marina development and approvals</p> <p>National Surfing Reserves (none on the Central Coast).</p> <p>Partnerships with tourism and recreation organisations for use of Crown reserves, camping areas and caravan parks.</p> <p>Crown land in coastal communities may be developed for various community purposes after suitable assessment processes.</p> <p>Assessment of Aboriginal Land Claims.</p> <p>Comments from L&PMA about their specific interests in coastline management in Wyong Shire have been taken into account in preparing the WSCZMP (see Section 15.5.1).</p>

Agency/organisation	Legislation, Policy and Plans	Responsibilities
Office of Environment and Heritage (OEH)	<p><i>Coastal Protection Act 1979</i> <i>Coastline Management Manual 1990</i> <i>Protection of the Environment Operations Act 1997</i> <i>National Parks and Wildlife Act 1974</i> <i>Threatened Species Conservation Act 1995</i> <i>Marine Parks Act 1997</i> NSW Sea Level Rise Policy Statement (DECCW 2009) Derivation of the NSW Government's sea level rise planning benchmarks. Coastal Risk Management Guide: Incorporating sea level rise benchmarks in coastal risk assessments Flood Risk Management Guide: incorporating sea level rise benchmarks in flood risk assessments. See also recent documents covering emergency coastal protection works (Section 8).</p>	<p>Overall policy and statutory direction on coastal hazards and climate change. Responsible for coordination of environmental services during and after storms. Research, protection and technical advice on coastal processes, monitoring of coastal ecological condition (threatened species and endangered ecological communities), water quality and Indigenous cultural heritage values, both within National Park estate and on other land. OEH also regulates major industry. The POEO Act 1997 and related policy documents set discharge standards to protect the values of receiving waters (e.g. for protection of aquatic ecosystems, or for primary or secondary contact recreation). Regulation of industry (discharge to the environment) including sewage treatment plants. Guidelines for management of stormwater, contributions to improved stormwater management through Urban sustainability fund of the Environmental Trust.</p>
Department of Planning and Infrastructure (DP&I)	<p><i>Environmental Planning and Assessment Act 1979</i> <i>Coastal Protection Act 1979</i> <i>State Environmental Planning Policy (SEPP) 71 (coastal)</i>, <i>SEPA14 (wetlands)</i>, <i>SEPP 26 (littoral rainforest)</i> <i>NSW Infrastructure SEPP Exempt and Complying Development SEPP</i> NSW Coastal Policy (Department of Planning 1997) Guidelines for coastal development to accompany DECCW (now OEH) sea level rise policy (Department of Planning 2010) Comprehensive Coastal Assessment (Department of Planning 2003). NSW Coastal Design Guidelines (Coastal Council of NSW 2003)</p>	<p>Overall framework for land use planning in NSW. Regional scale strategic planning processes such as the Central Coast. Planning guidelines to address natural resources constraints to land use, including coastal processes and climate change. Approval of LEPs and DCPs for local council areas. Development assessment and approval powers for major development.</p>

Agency/organisation	Legislation, Policy and Plans	Responsibilities
Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS), Fisheries and Mineral Resources divisions.	<p><i>Fisheries Management Act 1994</i> and Regulations.</p> <p><i>Offshore Minerals Act 1994</i></p> <p>Fishery Management Strategies for marine waters (such as Ocean Trawl, Ocean Trap and Line, Abalone) (Department of Primary Industries n.d.).</p> <p>Recreational Fishing Strategy (in preparation).</p> <p>Indigenous Fisheries Strategy (Department of Primary Industries 2002).</p> <p>Part 7A of the <i>Fisheries Management Act (1994)</i> outlines the threatened species provisions for fish and marine vegetation (EECs).</p>	<p>The NSW Fisheries part of DTIRIS NSW is responsible for regulation of commercial, recreational and Indigenous fisheries. This includes access to resources, measures to protect fishery habitat.</p> <p>The Mineral Resources section of DTIRIS NSW administers legislation about access to offshore minerals, including sand (as an extractive resource) which could potentially be used for beach nourishment.</p> <p>Coastal waters, or those within the three nautical mile limit, fall within the jurisdiction of State Governments.</p> <p>Exploration and mining activities in coastal waters are administered by relevant State Mining Acts, or, if enacted, offshore minerals legislation.</p>
NSW Maritime Authority		Responsible for managing and regulating the safety and environmental performance of waterway users (commercial and recreational), including suitability of ramps and jetties, boat speeds, wake creation, fuel management and pump-out management.
State Emergency Services (SES)	<i>State Emergency and Rescue Management Act 1989</i>	<p>Combat agency and coordination roles.</p> <p>DISPLANS relate to a wide range of disasters/emergencies, often with separate detail in sub plans (e.g. for fire, tsunami).</p> <p>Prepares plans for responding to storm, floods and other emergencies.</p> <p>Manages a large force of trained volunteers and staff for implementing these plans.</p> <p>Works closely with local government.</p>
NSW Department of Commerce	NSW State DISPLAN (State Emergency Management Committee 2009)	Supervise engineering services, particularly in relation to shoring up or demolition of buildings affected by erosion during storms.
Hunter-Central Rivers Catchment Management Authority	<p>Catchment Action Plan (HCRCMA 2007)</p> <p><i>Catchment Management Authorities Act 2003</i>.</p> <p><i>Native Vegetation Act 2003</i>.</p>	Responsible for coordinating and facilitating regional delivery of sustainable natural resource management.

Agency/organisation	Legislation, Policy and Plans	Responsibilities
NSW Natural Resources Commission	<i>Natural Resources Commission Act 2003.</i>	Provides policy and performance overview for catchment management authorities and for natural resources policies of the NSW government. Sets state-wide standards for natural resource management. Audits performance in implementation of Catchment Action Plans (CAPs).

Additional information about the objectives and application of these elements of the statutory and policy framework for the Wyong coastline are included in **Appendix 5**. Details of key policies and strategies that are particularly relevant to the management of the Wyong coastline and/or are recent additions to the management framework, are provided in the following sections.

15.5.1 Land and Property Management Authority responsibilities and issues, Wyong Shire

Crown land and Crown waterways in Wyong Shire are shown in **Figure 2.1** in **PART A** and is linked to coastal hazard studies in **Figure 15.1**. L&PMA and Council jointly manage Crown land under the *Crown Lands Act 1989*, in relation to public infrastructure such as surf life saving facilities, foreshore parks and amenities, reserve trusts, holiday parks on Crown land. L&PMA is a member of the Tuggerah Lakes Estuary and Coastline Management Committee.

Plans of Management have been prepared and are being implemented by Reserve Trusts:

- The Entrance Memorial Park and The Entrance North Terilbah Reserve (Wyong Shire Council 1996). This Reserve area is more associated with the foreshore of the Tuggerah Lake estuary, than with the coastline. L&PMA also has a number of commercial leases for businesses on Crown land on the foreshore of Tuggerah Lake.
- Norah Head Lighthouse Plan of Management (Suters Architects 2000), adopted 2002 and being implemented by community based Trust. Council and L&PMA are ex-officio members.
- Council is preparing Plans of Management in association with L&PMA, for Crown coastal holiday parks, including Toowoan Bay, Norah Head and Budgewoi. L&PMA has advised that surplus funds from these parks (and others generating a surplus) are used to fund significant works and facility development for reserves on estuary foreshores and the coastline, not only in Wyong Shire.

Other Crown leases on the coastline include the site of Kims at Toowoan Bay, Sun Valley Caravan Park and the Blue Lagoon Caravan Park. Potential coastal erosion impacts on these properties are discussed in **PART B, Sections 9.0** and **11.0**.

L&PMA notes that from its perspective, impacts on coastal lands from coastal erosion/sea level rise and climate change extend beyond physical erosion and include issues such as scenic amenity, potential for quality reserve visitation, public safety, continuity of public access and the loss of economically valuable, income generating assets. For instance, erosion impacts on Crown holiday parks would affect not just the built asset (cabins and associated infrastructure), but a significant recreational resource, coastal scenic amenity, beach access, and an income generating asset which supports other State Crown land management programs.

15.5.2 NSW Sea Level Rise Policy Statement (DECCW 2009)

The Sea Level Rise Policy Statement establishes benchmark values for sea level rise in NSW. The NSW government benchmarks for planning purposes predict that sea level will rise (above 1990 levels) by up to 40 centimetres by 2050 and 90 centimetres by 2100, and will continue to rise beyond that time. The magnitude of these anticipated changes, over and above already recorded sea level rise of 15 to 20 centimetres over the last century means that many coastal assets (such as buildings and infrastructure and coastal access) are likely to be seriously affected and adaptive measures are necessary for ocean frontage and low lying coastal land.

The Sea Level Rise Policy Statement notes that the NSW Government will support local councils to prepare and update risk assessments in relation to coastal erosion and coastal flooding. The Government will continue to support Councils to implement appropriate coastal protection works, particularly in relation to publicly owned assets.

Through the Department of Planning, the NSW Government has prepared guidelines on how local councils should consider sea level rise in land use planning and development approval decisions (see **Section 15.4.5**). This is part of adaptation to sea level rise and adaptation to other aspects of highly variable coastal environmental conditions.

Through the SES, the NSW Government will continue to support communities affected by coastal hazards and flood risks.

The 2009 Sea Level Rise Policy Statement makes it clear that the NSW Government does not accept responsibility or any obligation to reduce the impacts of coastal hazards and flooding caused by sea level rise on private property. Land owners may apply under the *Environmental Planning and Assessment Act 1979* to build protection works on the properties, provided these works do not cause an adverse impact on adjoining property or public land. Unauthorised works may be removed at the landowners cost. Landowners may also be required to contribute to the maintenance of public access and beach amenity values, for instance, through in perpetuity beach nourishment.

In the case of Wyong Shire, this means, for instance, permanent structures built to protect ocean frontage private property must be wholly located on the private property and landowners could be required to contribute to maintenance of beach amenity. Development consent is required. Emergency, temporary protection works may, in certain circumstances, be carried out on public land (see **Section 15.5.4** and **Sections 8.0** and **9.0** of **PART B**).

Details of how WSC will give effect to the planning aspects of the Sea Level Rise Policy Statement are included in **PART B, Section 9.0**.

15.5.3 Coastal erosion hot spots and Authorised Locations (Department of Climate Change 2009b)

The NSW Government announced specific arrangements for 19 'coastal erosion hotspots' in October 2009. Two of these – North Entrance Beach and Cabbage Tree Harbour, were in Wyong Shire.

Subsequently, OEH revised the hotspots list, to 15 locations, including The Entrance North, Hargraves Beach and Cabbage Tree Harbour.

Some of the 'Hotspots' are also listed on a schedule of Authorised Locations, (based on additional criteria to the Hotspots list), as part of further amendments to the Coastal Protection Act and associated draft guidelines, issued from June to October 2010. An

'Authorised Location' is currently defined as a beach where there are five or more houses and/or a public road assessed as being affected by immediate coastal erosion hazard.

North Entrance and Hargraves Beach are now identified as 'Authorised Locations' for short term emergency coastal protection works in proposed statutory and guideline amendments.

Because the issues and risks at Cabbage Tree Harbour are principally driven by geotechnical processes, rather than coastal erosion hazards, Cabbage Tree Harbour is not on the list of 'Authorised Locations'. Notwithstanding this, toe trimming by storm waves is a significant process at Cabbage Tree Harbour, undercutting and destabilising shallow landslips upslope. Council has obtained geotechnical advice and is constructing protection at the base of the slope at cabbage Tree Harbour. **Section 11.0** in **PART B** has details.

Councils are required to prepare a coastal erosion emergency management plan for Hotspots and Authorised Locations by 30 June 2011.

15.5.4 Overview of related OEH policies, legislation and guidelines released during 2010

In 2010 OEH (then DECCW) issued further technical guidance on managing hazards in the coastal zone, where shoreline recession and inundation are directly exacerbated by sea level rise.

The current coastal erosion management framework for NSW includes the following documents, most of which were finalised early in 2011: (The full list is at:

<http://www.environment.nsw.gov.au/coasts/coastalmgtdocs.htm>).

- Coastal Risk Management Guide: Incorporating sea level rise benchmarks in coastal risk assessments
- Code of Practice under the *Coastal Protection Act 1979*
- A Guide to the Statutory Requirements for Temporary Coastal Protection Works
- A guide for authorised officers under the Coastal Protection Act
- Guidelines for preparing coastal erosion emergency subplans
- Guidelines for assessing and managing the impacts of seawalls
- Coastal Protection Service Charge Guidelines
- Guidelines for preparing coastal zone management plans

Other specific technical guidance from OEH specifies hazard assessment processes and methods, including:

- The extent of calculated coastal recession (for 50 and 100 years) plus an allowance for reduced foundation capacity can be used as the coastal planning area. This is based on the Nielsen schema (see **Section 16.0**) and is used in the WSCZMP. OEH proposes that the coastal hazard planning area should be defined as the 2100 recession plus the area of reduced foundation capacity area, plus a further allowance for sea level rise (see **Section 16.0** for details). Recession estimates are based on extrapolation from measured recession over a 40 to 60 year period, with an additional allowance for the effects of sea level rise. Linear interpolation can be used for intervening planning periods (between immediate and 2100), but must be used with caution. Fine scale interpolation

is not appropriate where there is significant uncertainty about actual sea level rise or the interactions of coastal responses to multiple process drivers operating at different time scales.

- OEH currently recommends the use of the Bruun Rule for estimating unconsolidated open coast shoreline recession 'until more sophisticated methodologies are available' (see **Sections 16.5** and **16.6** for an explanation of the Bruun Rule). Research and development work is continuing to incorporate more complex variables into coastal recession modelling. An example is the development of a cross shore and long shore processes model, looking at medium and long term changes to wave climate as well as sea level rise) at Woolli and Batemans Bay. This research has been partially sponsored by OEH.
- The OEH Guidelines presents design still water levels for fully oceanic tidal waters. These are based on Watson and Lord (2008) and CSIRO (2009). It is proposed that these levels will be used for design of maritime structures, determining oceanic inundation/runup and hydrodynamic modelling. Locally derived still water conditions should be used for estuarine waters.
- The Coastal Risk Management Guide with Sea Level Rise Benchmarks updates the sea level rise section of the Floodplain Risk Management Guideline: Practical Consideration of Climate Change (Department of Climate Change 2007); other sections of this guideline still apply unchanged.

15.5.4.1 Coastal Protection Act amendments 2010

OEH has recently reviewed and updated the *Coastal Protection Act 1979* and several other pieces of legislation, with the general intent of better recognising coastal hazards and streamlining processes for managing hazard impacts on development along the coast.

The Coastal Protection and other Legislation Amendment Bill – Exposure Draft was released in April 2010. Following consultation with local councils and some other stakeholders, further proposed amendments were made to the legislation and another round of consultation was held with local Councils in August 2010. The Bill was approved by Parliament in October 2010.

The recent amendments to the *Coastal Protection Act 1979* have five main objectives (see <http://www.environment.nsw.gov.au/coasts/QuestionsandAnswers.htm>):

- Add adaptation to sea level rise as an objective of the *Coastal Protection Act 1979* and *Local Government Act 1993*
- Provide greater clarity in the protection of beaches and property, so that side effects of coastal protection, including erosion elsewhere and impacts on public access and beach amenity are properly considered.
- Improve the operation and enforcement of the *Coastal Protection Act 1979*. The amended Act enhances powers to restrain breaches, issue orders and generally enforce the installation and maintenance of coastal protection works. Enforcement powers will generally be in line with the *Protection of the Environment Operations Act 1997*. The definition of a 'beach' is altered to include the sea bed out to 10 metres of water depth.

In particular, authorised officers within councils or state agencies, who have appropriate skills and knowledge, will have legal powers to investigate breaches and issue orders under the *Coastal Protection Act 1979*. Councils or the Minister will also have powers to issue stop work orders for unapproved action likely to result in significant beach erosion.

Amendments to the *Local Government Act 1993* will clarify indemnity provisions for local government. OEH states 'these will specify more clearly the limits of liability for property damage due to coastal erosion caused by natural processes, exacerbation by climate change, failure to upgrade works in response to climate change or failure to undertake compliance to remove illegal structures or to require a landowner to maintain approved private works'. Note that WSC has decided that it will not take up the option of having its officers trained to be authorised officers under the *Coastal Protection Act 1979*.

- Provide landowners with legal opportunities to protect their property from coastal erosion threats
- Establish a NSW Coastal Panel. The Coastal Panel is a group of experts in coastal processes and coastal planning, nominated by local government and State government. The Panel will provide advice to the Minister on coastal issues and has a role in the determination of applications for long term coastal protection works in certain circumstances.

15.5.4.2 Temporary and permanent coastal protection works

Emergency (temporary) protection works in coastal erosion contexts.

Emergency protection works are permitted at Authorised Locations.

It is intended that these works will only occur when damaging beach erosion is imminent or likely to be imminent. This is considered to be when the distance between the most seaward part of a wall of an existing residential building or commercial building and the most landward extent of the dune escarpment (i.e. a previous wave cut erosion escarpment) is less than 20 metres. The Infrastructure SEPP, *Marine Parks Act 1997* and *Crown Lands Act 1989* have been amended to permit temporary landowner funded emergency works where they are consistent with council's coastal erosion emergency management plan and the NSW government Code of Practice.

The Code of Practice Under the Coastal Protection Act 1979 (DECCW 2011a) and the Guide to Statutory Requirements for Emergency Coastal Protection Works (DECCW 2011b) limits the locations where temporary erosion protection works may be placed by landholders, and the types of works that are acceptable (supplementing section 55P(2)(e)) of the *Coastal Protection Act 1979*:

- Permitted emergency protection works include placing sand or large geotextile bags filled with sand on the beach or at the foot of the frontal dune, with designs specified in the Minister's requirements.
- Emergency works may be placed in advance of an actual erosion event and may remain in place for 12 months (or until a development application for long term works is determined)
- If emergency works are causing unintended erosion side effects, an authorised officer (from Council or OEH) may issue an order requiring that the works are removed. If emergency works are not removed by the landowner when the approved period has expired, an authorised officer may order their removal and recover costs from the landholder.
- Access to the beach for the placing of emergency works must only use specified beach access points
- Specified exclusion areas must not be disturbed

- Works may only be placed where no form of coastal protection, such as a sea wall – whether constructed lawfully or unlawfully, exists seaward of the building. An exception can be made (after application and approval) if a professional engineer certifies that the existing protection works provide a lower level of protection than the allowable emergency works
- Fenced and signed dune restoration areas must not be disturbed
- Vegetation other than grass and other non woody vegetation on public land must not be disturbed, unless the private landholder has obtained written permission from the public land owner.
- All sand used in emergency protection works must be clean silica marine or riverine sand, uncontaminated, in the 0.15 to 0.5 millimetre size range, and of a colour compatible with the natural sand on the beach and dunes.
- Works may take place only at specified times for safety reasons
- Works may be carried out on public land in certain circumstances, including specific notification requirements
- Removal and remediation requirements. Council has the power to order removal of works which have not been adequately maintained or which have been in place for 12 months.

The process required by these Minister's requirements leaves only a very small window of opportunity for temporary coastal protection works to be carried out by private land holders.

Long term coastal protection works

The legislation permits appropriate land owner funded long term coastal protection works. These works will require development consent under the *EP&A Act 1979* and must meet requirements in State Environmental Planning Policy (Infrastructure). Council can also undertake coastal protection works to protect public property and may come to a formal agreement with private landholders about shared construction arrangements and funding.

OEH provides some preliminary advice about the statutory requirements for permanent coastal protection works.

Where a private landholder proposes to construct works to protect their private property, the works must be constructed on private property.

The works must be consistent with the Best Practice Guidelines (and the Infrastructure SEPP) and will be assessed by councils or by the Coastal Panel.

Proponents are responsible for maintaining the protection structure (sea wall)

Proponents of any works must demonstrate that there will not be adverse off site impacts during construction and in the longer term. Proponents are responsible for managing offsite impacts. Landowners may be required to pay for ongoing maintenance and beach nourishment, to maintain beach amenity.

The legislation provides that 'Councils will be able to levy a charge on land whose current or past owners have legally built a sea wall or other long term protection works since the commencement of the Act. The charge will fully cover Council's costs of maintaining the wall and restoring any areas of beach that may be eroded by the sea wall where these

requirements are not a development consent condition'. OEH has also released a guideline to explain how the coastal protection charge may be applied.

15.5.5 NSW Coastal Planning Guideline: Adapting to sea level rise (Department of Planning 2010)

This Guideline presents a suite of principles, a process for identifying coastal risk areas and comments on strategic planning and development assessment – these are all linked back to the principles.

The draft Guideline supplements a broad suite of NSW planning documents that refer to climate change:

- NSW Sea Level Rise Policy Statement (DECCW 2009)
- Guide to Statutory Requirements for Emergency Protection Works (DECCW 2011b)
- NSW Coastal Policy (Department of Planning 1997)
- Coastal Regional Strategies (e.g. South Coast, Sydney Metropolitan, Central Coast, Lower Hunter, Mid North Coast, Far North Coast)
- Coastline Manual (as amended and/or superseded in the current (December 2010) Guideline) and Floodplain Development Manual (NSW Government 1990)
- Coastal Design Guidelines (Coastal Council of NSW 2003)
- State Environmental Planning Policy No. 71 – Coastal Protection
- EP&A Act, Section 117, Direction 2.2 Coastal Protection (Department of Planning 2009)
- EP&A Act, Section 117, Direction 4.3 Flood Prone Land (Department of Planning 2009)
- Standard Instrument - Principal LEP
- Amendments to the NSW Infrastructure SEPP

The guideline is focused on land based development. It does not specifically deal with coastal development that is not on land, such as marinas, jetties, wharves and is also not specifically designed to address coastal protection works as 'development'.

Table 15.5 summarises the Principles and the issues that are presented for consideration in the draft Guideline. The table also shows how these principles have been taken into account in the preparation of the WSCZMP.

Table 15.5 - Principles in DoP (now DP&I) guideline 2010

Principle	Broad planning application	Application in WSCMP
Principle 1 Assess and evaluate coastal risks taking into account sea level rise planning benchmarks	Identify coastal risk areas (hazard studies). Coastal risk areas include SLR to 2100. Use hazard 'investigation areas' based on 'rule of thumb' for areas where detailed studies have not been completed.	Information about coastal erosion hazards, calculated using the OEH sea level rise planning benchmarks is in Section 8.0 and Section 9.0 in PART B and Section 16.0 in PART C .
Principle 2 Make coastal risks known to the public	Identify coastal risk areas (hazard studies)	Consultation about the preparation of the WSCZMP is one way to make the coastal risks better known and understood by the local community. See Sections 3.0 in PART A and Section 7.0 in PART B for information about current and future consultation activities.
Principle 3 Avoid intensifying land use in coastal risk areas through appropriate planning	Strategic land use planning in coastal areas	Section 9.0 in PART B introduces a range of options for managing risks in the coastal risk areas, including new land use planning requirements for existing and new development.
Principle 4 Consider options to reduce land use intensity in coastal risk areas where feasible	Strategic land use planning in coastal areas <ul style="list-style-type: none"> • Incorporate coastal and related flood risk studies into strategic planning • Consider the effects of protection works on land use capability – structural protection works to be consistent with an approved coastline, floodplain or emergency management plan • Accommodate new growth in coastal communities (but not in coastal risk areas). • Manage existing developed areas in coastal communities. Acknowledges that back zoning is difficult to achieve, but may be possible for come public land, or land that is also constrained by other significant coastal hazards or lack of services. Could add new objectives to land use zones or increase lot size. • Maintain foreshore access, amenity and open space and protect coastal environments. Accommodate land ward migration of ecological communities. Consider areas available for public open space outside the coastal risk area (or to be able to retreat). Note this will require complex arrangements with L&PMA 	Sections 9.0 and 11.0 in PART B identify coastal risk areas and a range of strategies to reduce development risks by aligning new private and public development, including surf club buildings, with coastal risk areas and maintaining safe public access onto beaches and headlands.

Principle	Broad planning application	Application in WSCMP
Principle 5 Minimise exposure to coastal risks from proposed development	Development assessment in coastal areas	As above, Section 9.0 in PART B identifies development assessment controls for new development in coastal risk areas, for different time scales.
Principle 6 Implement appropriate management responses and adaptation strategies.	<p>Development assessment in coastal areas</p> <p>Planning criteria for proposed development in coastal risk areas (i.e. all land seaward of the 2100 hazard line with SLR). In general, development would not be approved seaward of the immediate coastal hazard line (but some minor works may be permitted).</p> <p>Criteria:</p> <ul style="list-style-type: none"> • Development avoids or minimises exposure to immediate coastal risks (seaward of immediate hazard line) • Development provides for the safety of residents, workers or other occupants on site from risks associated with coastal processes (link to emergency response planning), site layout and design details. • Development does not adversely affect the safety of the public off-site from a change in coastal risks as a result of development • Development does not increase coastal risks to properties adjoining or within the locality of the site • Infrastructure, services and utilities on site maintain their function and achieve their intended design performance • Development accommodates natural coastal processes- – the guidelines suggest a range of management responses/adaptation strategies, which could be required by a DCP. • Coastal ecosystems are protected from development impacts • Existing public beach, foreshore or waterfront access and amenity is maintained. 	See Section 9.0 (PART B) .

15.5.5.1 Proposed DP&I LEP clauses for coastal risk areas

Department of Planning (2009) has proposed the following draft Coastal Risk Planning Model Clause (**Box 15.2**).

The model clause directly links council's strategic planning to the coastal hazard assessment and requires that proponents and Council consider the impacts of development on the coastal risk area. Council is currently preparing a new LEP, taking the model into account.

Box 15.2: Model LEP Clause

Coastal risk area

1. The objectives of this clause are:
 - a) To maintain existing coastal processes and to avoid adverse impacts from those coastal processes; and
 - b) To enable safe evacuation of coastal risk areas in an emergency; and
 - c) To avoid significant adverse effects on the environment; and
 - d) To ensure uses are compatible with coastal risks.
2. This clause applies to land shown as 'coastal risk area' on the coastal Risk Planning Map (*note this map is based on the 2100 coastal erosion hazard line, including sea level rise and landward of the zones of slope adjustment and reduced foundation capacity – See Section 16.0 in PART C.*)
3. Consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:
 - a) Will not adversely affect coastal processes resulting in detrimental increases in coastal risk exposure of other development or properties; and
 - b) Will not significantly alter coastal processes to the detriment of the environment; and
 - c) Will make provision for safe evacuation of the land;
 - d) *If located seaward of the immediate hazard line, will avoid or minimise exposure to coastal processes (note council may choose to prohibit development seaward of the immediate hazard line except for certain maintenance or minor repairs. **Wyong Shire Council supports the prohibition of new development seaward of the Immediate hazard line, except for specific circumstances, which are discussed in Section 9.0 in PART B**);* and
 - e) Make provision for relocation or modification if required (this is discussed in **Section 9.0 of PART B**).
4. In this clause:

Coastal risks include coastal erosion, tidal inundation and coastal flooding

Immediate hazard line is the line identified on the coastal risk planning map which represents the estimated extent of beach erosion from a design storm event (as outlined in the Coastal Risk Management Guide 2009).

15.6 Australian government requirements and initiatives

The Australian Government has diverse interests in the sustainable management of Australia's coastline, and has increased its focus on coastal management issues in response to potential climate change and sea level rise. In October 2009, a House of Representatives Standing Committee released its report '*Managing our Coastal Zone in a Changing Climate*' (House of Representatives Standing Committee on Climate Change, Water, Environment and the Arts 2009). The report includes 46 recommendations. Many of the recommendations address high level governance issues. Recommendation 19 suggests further studies by the Australian Productivity Commission into the impacts of climate change on insurance matters. New policy that may emerge as a result of this further inquiry would

be relevant to those properties along the Wyong coastline that are within the 2050 and 2100 coastal risk areas.

The Australian government has indicated that it will respond to the recommendations of the House of Representatives Inquiry by the end of 2010.

The Department of Climate Change (now Department of Climate Change and Energy Efficiency - DCCEE) released a first pass national coastal vulnerability assessment, *Climate Change Risks to Australia's Coast* in November 2009 (Department of Climate Change 2009a). The assessment assumed 1.1 metres of sea level rise and used medium resolution elevation data, and in NSW, an allowance for a 1 in 100 year storm tide event. At this scale and with the assumptions made, Wyong and neighbouring Lake Macquarie and Gosford councils were found to be the most at risk local government areas to coastal inundation, principally because of the amount of residential development around lake and estuary shorelines, below 2.5 metres AHD. Based on the same sea level rise parameters and considering soft (unconsolidated sandy) land within 110 metres of the current shoreline, Wyong Shire Council ranked 7th in NSW (generally the most at risk local councils are in the Sydney Metropolitan Area). The 110 metre distance is *indicative* of the amount of shoreline retreat on sandy coastlines due to sea level rise, by 2100.

For more information about Australian government research, reports, policy and guidelines, visit the DCCEE web site, at www.climatechange.gov.au.

Table 15.6 summarises the Australian Government legislation and policy which provide context for managing the Wyong coastline.

Table 15.6 – Australian Government policies and legislation

Department	Relevant legislation, policy or plans	Requirements and responsibilities
Emergency Management Australia (EMA)	Australian government Emergency Management Policy Statement	<p>The Australian government supports the states in managing emergencies (including reducing the likelihood that emergencies will occur).</p> <p>EMA administers natural disaster relief arrangements to assist State and Territory governments cover costs associated with disaster relief and recovery. EMA prepares guidelines for nationally consistent approaches to emergency planning and management. EMA runs courses and provides information on risk management to build capacity for specific types of emergencies.</p> <p>EMA provides funding through the Disaster Mitigation Program and Regional Flood Mitigation Program to address priority risks. Funding can be used for disaster risk assessment, mitigation strategies and measures, resilient infrastructure and community awareness and warning systems.</p>

Department	Relevant legislation, policy or plans	Requirements and responsibilities
Commonwealth Bureau of Meteorology (BoM)		The Bureau of Meteorology provides oceanographic climate, storm, hydrology and other data to predict and provide warnings about severe weather conditions such as tropical cyclones and east coast lows.
Australian Government Department of Sustainability, Environment, Water, Population and Communities	<p><i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act).</p> <p>Australian Government Coastal Policy (Department of the Environment and Water Resources 1995)</p> <p>Australian Government Bilateral Agreements for migratory birds (JAMBA, CAMBA, ROCKAMBA) (Department of Sustainability, Environment, Water, Population and Communities 2009)</p> <p>Administers community and CMA grants for environment projects</p>	<p>A number of migratory shorebird species nest, feed and roost along the Wyong coastline in summer.</p> <p>Places of Indigenous cultural heritage value and historical value are identified in the National Heritage List and previously in the now closed Register of the National Estate (fully registered or as Indicative Places). There are no such places identified along the Wyong coastline.</p> <p>These factors trigger assessments under the EPBC Act for development proposals.</p> <p>HCRCMA has completed projects along the Wyong coastline; for instance building knowledge about the ecological values of local rock platforms.</p>
Australian Government Department of Climate Change and Energy Efficiency	Responsible for climate change <i>mitigation</i> research and development of statutory and policy responses and for climate change <i>adaptation</i> research and policy development.	<p>Investment in studies to improve understanding and preparedness for climate change, particularly sea level rise and changes to storm intensity/frequency.</p> <p>Investment in planning and other activities to reduce risk.</p> <p>Recent documents produced by DCC (&EE) include:</p> <p>Climate Change Risks to Australia's Coast: A First Pass National Assessment (2009a) and the Preliminary Conclusions of the Coast and Climate Change Council (see below)</p>
Geoscience Australia See www.ga.gov.au/marine for details of Geoscience Australia programs and research projects.	<p>Australian Oceans Policy</p> <p>Seas and Submerged Lands Act 1973</p> <p>EPBC Act 1999</p>	<p>Geoscience Australia (Marine and Coastal Group) prepares research and management reports to assist the Australian government to set policy and provide resources for the management of natural hazards, including coastal erosion.</p> <p>In addition, Geoscience Australia administers the Australian government <i>Offshore Minerals Act 1994</i>. This Act provides the framework for exploration and production of minerals on the continental shelf, beyond the jurisdiction of the States.</p>

15.6.1 Coast and Climate Change Council

The Department of Climate Change and Energy Efficiency established a Coast and Climate Change Council in 2009. The Council delivered its preliminary conclusions in early 2010. Parts of these conclusions are reproduced below, because they make a strong case from the Australian Government for risk reduction measures to help communities adjust successfully to climate change.

Preliminary conclusions from the Coast and Climate Change Council, 2010

(from www.climatechange.gov.au/government/adaptat.aspx)

Coastal climate change – tackling the challenge

Coastal Australia is confronted with an immense array of risks from climate change. These risks will challenge all sectors of society, the economy and the environment.

The Government report *Climate Change Risks to the Australia's Coast* identifies up to 247,000 residential buildings across all states, at a value of \$63 billion, at risk of being inundated or eroded this century. In addition there are the risks to public infrastructure and businesses as well as adverse impacts on treasured environmental values and amenity facilities that have not yet been quantified.

Australia is a coastal nation where most people live, work, and recreate. Population in city, regional and even some remote coastal locations continues to grow. Some coastal places are already subject to periodic damage by floods, storm wave erosion and now even higher king tides. These impacts will be exacerbated by the forces of climate change and are already becoming evident in certain sensitive locations.

Development around the Australian coast assumed that sea level and storm events would function as they have in the past. We designed our housing estates, business sites and public utilities as if the coastline and tidal levels would not change. ***Such assumptions are no longer valid.***

As a nation we cannot ignore the evidence that climate change during this Century will have significant adverse impacts on living conditions, the economy and the environments of coastal regions. The insurance industry is taking steps now to raise rates in some areas deemed to be at increasing risk, with implications for the value of properties.

It is time for Australia as a whole to grasp the new reality. Action should begin now to prepare Australia to respond to the challenge and to ensure that our children and future generations are best positioned to cope.

There is an urgency to start now in building the resilience of Australia to climate change. The existing risks are large, and decisions are continuing which will likely increase those risks and increase the burden we are placing on future generations and budgets.

Improve understanding of response options

Although managing coasts and coastal communities vulnerable to coastal risks has been core business for many local communities and agencies overtime, adaptation to coastal climate change impacts is a new agenda and there is considerable uncertainty as to what action should be taken and when. There needs to be clear guidance on public and private obligations and options in responding to and preparing for climate change, both in terms of managing changes with existing developments and for new investments.

Decision-makers need access to information on the costs and benefits of response options, and mechanisms which facilitate the sharing of lessons learned from taking action. Ready access to such robust information will help local communities to manage their exposure to climate change impacts.

Enhance general consistency across governments

Emerging issues such as planning and legal matters, property valuation, insurance availability and building standards will have a direct impact on many Australians. A number of communities are particularly vulnerable because of social disadvantage or because they are located in areas that are facing immediate threat, for example low lying Australian island settlements.

Many individuals and communities are currently confused about what may constitute effective action to reduce their own risks due to inconsistent instruments and approaches between governments.

There is an urgent and continuing need to reduce uncertainty and enhance consistency in coastal planning and decision-making. At the same time, it will be important to address the different degrees of exposure that will be evident at different places around the coast – sea level rise will not be uniform, different extreme events like storm surges and cyclones have regional characteristics, and the form of development differs between places.

15.6.2 Australian Government investment in adaptation to climate change

The Australian Government (through the Department of Climate Change) initiated the National Climate Change Adaptation Program, with a budget of \$126 million.

As examples, in early 2010, the Department of Climate Change summarised its support of the following research and assessment programs:

- National Climate Change Adaptation Research Facility, at Griffith University – funded \$20 million over four years
- Local Adaptation Pathways program - \$2 million for local government adaptation projects
- Integrated assessment of human settlement sub program – climate change capacity building for local government
- Climate change adaptation skills for professionals – professional development and accreditation
- National coastal risk assessment
- Biodiversity vulnerability assessment
- Implications of climate change for Australia's World Heritage properties
- Implications of climate change for Australia's National Reserve System

These programs operate at a national scale and are not intended to provide direct local scale advice for local councils such as Wyong. However, the outcomes of the current Australian Government programs will support the introduction of consistent condition and threat assessment, risk management processes and effective actions across all jurisdictions. This has the effect of increasing certainty for local government and communities.

15.7 Is the existing management framework promoting resilience of coastal values in the context of climate change?

Management decisions about land use and styles of development in the Wyong coastal zone, made over many decades, have been based on the best available information at the time and have embodied assumptions about the nature of change in coastal contexts. For many years, a key assumption for many locations has been that the coastal environment is 'stable' other than the short term effects of storms.

These previous assumptions are no longer valid.

Recent science and coastal engineering studies at local, regional and global scales confirm that coastal landscapes are changing and will continue to change in response to shifts in

climate variables and sea level rise. These changes are outside the magnitude of variability due to storms experienced in historical times.

The NSW and Australian governments have moved over the last two years to update and modernise their assessment and management frameworks for coastal zone management, to better accommodate the dynamic coastal processes associated with climate change. Wyong Council is also in the process of updating its approach to coastal zone management issues, to ensure that risks are properly identified and that risk reduction measures are in place to support sustainable coastline management.

All levels of government have adopted an adaptive approach to coastal zone management and will regularly review policy and planning frameworks, using the best available information about climate change, sea level rise and coastal processes, as well as the success of coastal zone management initiatives.

15.7.1 Knowledge gaps

Despite advances in coastal science and modelling, there is still significant uncertainty about exactly how local areas of the coast will respond to sea level rise and particularly to the broader variables of climate change such as storm frequency and intensity. This uncertainty is one of the reasons for applying both a risk management framework and an adaptive management framework to decisions about coastal zone management. There is also a lack of information about how coastal communities perceive risks associate with coastal processes, as modified/exacerbated by climate change.

Along the Wyong Shire Council coastline, there is abundant evidence of the impact of large historical storms on beaches and dunes. Less clear is how the coastal dunes will roll back or be lost as sea level rise changes the balance of sediment distribution between terrestrial (including movements landward and along shore), nearshore and offshore deposits. Similarly, it is not yet clear exactly how the entrance to the Tuggerah lakes will respond and how lake entrance changes will affect sediment dynamics. How will the specific characteristics of individual beaches, such as rock reefs and rip cells, affect erosion during storms?

It is known that sea level fluctuated slightly during the Holocene (the last 6000 years), but research information has not provided details about how beaches and dunes responded at a scale that is suitable for predicting detailed beach and dune dynamics in the future.

15.7.2 Gaps in policy and legislation

At the broader level of integrated, sustainable coastal zone management some significant policy gaps and inconsistencies remain. As an example, both the Australian Government Coastal Policy and the NSW Coastal Policy are more than 15 years old and refer to outdated or superseded science and governance structures. Further gaps are evident between approaches to marine and terrestrial elements of the coast, between sandy and rocky shoreline assessments and between coastal natural resource management and planning frameworks.

The extent of media coverage of conflicts in the Land and Environment Court about coastal development approvals and policies about construction of sea walls makes it clear that the coastal management framework that has been in place in recent years has not met the needs of coastal communities under pressure from both changing coastal process dynamics and socioeconomic demands.

The State government initiatives discussed in **Section 15.5** indicate how the NSW Government is moving to provide greater clarity and certainty about appropriate coastal development and risk reducing planning controls.

Wyong Council's current LEP and DCA77 are now outdated in their approach to development assessment of land in currently identified coastal risk areas. Council has deferred a number of decisions, pending State government advice and a more appropriate planning framework. This has led to a number of appeals to the Land and Environment Court and no certainty for landowners or for Council.

The WSCZMP, together with Council's climate change policy (2010), and upcoming changes to the Wyong LEP and DCP 77 are intended to assist Council and its community to meet the challenges of existing coastal erosion hazards and climate change.

15.7.3 Institutional cooperation

Australian, State and local government, and non government organisations all share responsibilities for coastal zone management, including statutorily defined roles in:

- strategic policy framework
- land use planning
- emergency response
- regulation and enforcement
- rehabilitation; and
- communication with stakeholders

As for many aspects of environmental management and natural resource management, the institutional scale for management decisions, implementation and evaluation has varied over time and continues to change.

The current reforms of NSW coastal zone legislation, policy and guidelines are, in part, intended to clarify institutional roles and responsibilities and provide greater certainty for councils and land holders.

In the natural resource management context, HCRCMA is working towards more effective alignment and collaboration between institutions at different scales, to reduce conflicting approaches and priorities across jurisdictions.

15.7.4 Community engagement

The rate of change of coastal processes and the predicted impacts of sea level rise and climate change on coastal assets mean that there are many new issues for landowners, visitors and Council to come to terms with. To ensure that all stakeholders have the capacity to make informed and objective decisions about managing risks to coastal assets, new communication programs and a strong community engagement program are essential. WSC has commenced engagement with its community about climate change issues. The WSCZMP identifies a range of strategies to help raise community awareness of how climate change is expected to affect the coastline and the opportunities for Council and landowners to manage risk.