

Part 3 – Identified Management Options

12.0 Identified Management Actions

This section sets out the management actions that have been identified through various field studies, community consultation and literature review. This section can be used in conjunction with the Foreshore Inventory database (see **Section 12.1.1**) and associated GIS layers (see **Section 12.1.2**).

12.1 Potential Funding Sources

This Plan includes numerous management actions that will require various levels of capital input. **Table 12.1** contains a summary of potential funding sources for the identified actions.

Capital investment and recurrent expenditure can be sourced through the funds of Port Stephens and Great Lakes Councils, including section 94 contributions and rate revenue. This investment by the Councils can also be used to attract grant funds from a wide range of State agency programs, and also from the Commonwealth Government. Apart from the general health, amenity and sustainability benefits for the community as a whole, local businesses are significant beneficiaries of an attractive and well managed foreshore, with high quality facilities. It is therefore appropriate for commercial interests to contribute for foreshore improvements, providing their investment is consistent with the public interest and sustainability objectives of foreshore management and is also consistent with the requirements of the *Crown Lands Act 1989* and *Local Government Act 1993*.

Table 12.1 – Potential Funding Sources

Funding Program	Funding Agency	Purpose of Fund
Estuary Management Program	DECC	Provides funds to allow local communities to develop and implement plans to restore and protect estuaries.
CMA Incentives Program 2007-2008. Includes Small Projects Grant; and Land and Vegetation Management Incentives (e.g. Tide to Table)	Hunter-Central Rivers CMA (Natural Heritage Trust and Hunter Catchment Contributions)	Small Projects Grant – on ground works that address a natural resource management issue. Available to individual landholders and community groups only. Total of \$350,000 available. Maximum of \$7500 per grant. Land and Vegetation Management Incentives – larger on-ground works aimed at improving biodiversity, e.g. enhancing foreshore vegetation. Available to landholders, community groups, local government, industry and agencies. Total of \$1.6 million available.

Table 12.1 – Potential Funding Sources (cont)

Funding Program	Funding Agency	Purpose of Fund
Local Government, State Agency and NGO Partnerships Program 2007-2008	Hunter-Central Rivers CMA (Australian Government Natural Heritage Trust)	For on-ground works to help achieve the management targets in the Hunter-Central Rivers Catchment Action Plan. One of the targets of the Catchment Action Plan is instream and foreshore stabilisation. Total of \$1.8 million available. Projects larger than \$100,000 will be given priority.
Integrated Land Management Project	Hunter-Central Rivers CMA	Subsidised courses in sustainable land management for rural landholders. Landholders who have undertaken courses can apply to implement on ground works in line with the objectives of the course.
Maintaining Australia's Biodiversity Hotspots Program	Department of the Environment and Water Resources (Commonwealth)	Aims to improve the conservation of biodiversity hotspots. Program supports two activities: stewardship programs for on ground biodiversity improvements; and voluntary acquisitions. Total of \$21 million available across Australia.
Various heritage grants, including National Heritage Investment Initiative, Indigenous Heritage Program, National Trusts Partnership Program	Department of the Environment and Water Resources (Commonwealth)	National heritage Investment Initiative – provides assistance to restore and conserve Australia's most important historic heritage places; Indigenous Heritage Program – aims to protect and share Australia's Indigenous heritage; National Trusts Partnership Program – grants to support activities that increase public awareness, understanding, and appreciation of Australia's cultural heritage, and enhance and promote its conservation.
Australian Government Envirofund	Natural Heritage Trust	For community groups and individuals to undertake small on the ground projects aimed at conserving biodiversity and promoting sustainable natural resource use. Grants for up to \$50,000 available.
Indigenous Protected Area Program	Department of the Environment and Water Resources (Commonwealth)	Support for Indigenous landholders to manage their lands for the protection of natural and cultural features.

Table 12.1 – Potential Funding Sources (cont)

Funding Program	Funding Agency	Purpose of Fund
Threatened Species Network Grants program	World Wildlife Fund – Australia	Provides support for communities to conduct on ground work for protection of natural environment, specifically targeting threatened species and ecological communities. Round 10 (2007) now closed.
National Landcare Program (e.g. Natural Resources Innovation Grants; and Community Support Component)	Department of Agriculture, Fisheries and Forestry (Commonwealth)	Supports collective action by communities to undertake projects that aim to sustainably manage the environment and natural resources. Natural Resources Innovation Grants – one-off grants to encourage people in farming, food, aquaculture and forest industries to contribute to sustainable production. Community Support Component – funds local and regional Landcare activities.
Environmental Trust (e.g. Environmental Restoration and Rehabilitation Grants, Urban Sustainability program)	NSW Government	Objectives include to encourage and support restoration and rehabilitation projects, to fund the acquisition of land for the national parks estate, and to fund environmental community groups.
Maritime Infrastructure Program	NSW Maritime	Funding for local government and community organisations for waterways infrastructure programs which benefit the recreational boating community.
Public Reserves Management Fund	Department of Lands	The Department of Lands has a limited pool of funding to assist Trustees with the management of Crown land. The funding is available to improve facilities and protect the values of Crown land or its component facilities. The fund specifically provides finance to Trusts for reserve management planning, improvement works to Crown reserves and for capital development and maintenance projects. Its ongoing existence relies on issuing low interest loans to Trusts rather than substantially being a source of grants.

Table 12.1 – Potential Funding Sources (cont)

Funding Program	Funding Agency	Purpose of Fund
Private sector investment		<p>Private sector funding could take the form of a financial contribution to public domain works as part of any development proposal or direct public works to be completed by the developer.</p> <p>Businesses, including tourism operators, are a major beneficiary of improvements to the foreshore. Sharing the cost of investment in relevant infrastructure and protection measures should therefore be considered.</p>

12.2 How to use Management Action Tables

Each section contains a summary of the main issues and actions identified for each management zone as well as for the foreshore as a whole. Each summary is followed by a table of management issues and associated identified actions. The table also identifies the responsible organisation, a priority and timeframe, and an indicative cost.

The management tables provide a guide to key investment in the management and improvement of the foreshore. The actual implementation schedule for management actions is influenced by several factors, including:

- investment required for other major Council responsibilities and initiatives (such as other major infrastructure requirements);
- the availability of suitable funding mechanisms (such as matching grants) in a competitive grant market;
- the relevance of foreshore improvement projects to ongoing State and Commonwealth government investment priorities;
- the capacity (and relevance) of the private sector to contribute to improvements in various foreshore management zones;
- new information becomes available, such as climate change risk information and ecological resilience information; and
- future changes to community aspirations and preferences.

12.2.1 Foreshore Inventory Database (Microsoft Access)

The Foreshore Inventory database is a relational database that contains all of the identified foreshore assets within each management zone. The database also contains all of the information summarised in the management action tables in **Sections 12.3 to 12.17**. The database can be used by creating queries. For example, all of the management actions with a number 1 priority in Management Zone A1 can be extracted and displayed; or all of the management actions in relation to foreshore stability for Management Zones B1 and B2 can

be extracted and displayed; or simply all of the foreshore assets within a specific Management Zone can be extracted and displayed. Each foreshore asset has been given a unique number. This number links the Foreshore Inventory database with GIS (MapInfo) layers.

12.2.2 GIS Layers (MapInfo)

The following GIS layers have been generated in relation to the Port Stephens foreshore:

- areas of Aboriginal heritage sensitivity;
- European heritage sites;
- current and proposed walkways/cycleways;
- vegetation communities;
- EECs;
- aquatic habitat;
- SEPP 14 wetlands;
- SEPP 26 littoral rainforest;
- locations where public access is discouraged/inhibited on public land;
- LEP zoning;
- Marine Park Zoning;
- areas suggested for rezoning/DCP and acquisition;
- existing waterway access facilities;
- areas with foreshore stability issues;
- potential sources of water pollution; and
- all identified foreshore assets.

12.2.3 Explanation of Table Headings

The tables contained in **Sections 12.3 to 12.17** were extracted from the Asset Inventory database. The queries are named: Whole Management Action Table, A1 Management Action Table, A2 Management Action Table, etc.

12.2.3.1 Issue

The issue column contains the management issues identified through fieldwork, community consultation or literature review. It summarises an important problem or fact that needs to be taken into consideration in that particular management zone.

12.2.3.2 Relevant Asset Description/Number

This column contains the foreshore assets that are relevant to, or affected by, the management issue.

12.2.3.3 Management Action

A list of management actions identified to address the management issue.

12.2.3.4 Management Type

The Management Type column identifies the management action as:

- operational (o) – requires an on-the-ground action, e.g. ‘undertake environmental audit’;
- management (m) – requires action at a managerial level, e.g. ‘consider rezoning or develop Estuary Foreshore DCP’; and/or
- capital (c) – requires capital investment, e.g. ‘construct new amenities block’.

12.2.3.5 Responsibility

The Responsibility column identifies the organisation(s) responsible for carrying out the action. The abbreviation for each organisation is set out below:

PSC =	Port Stephens Council
GLC =	Great Lakes Council
Dept Lands =	Department of Lands
MPA =	Marine Parks Authority
CMA =	Catchment Management Authority
Dept Planning =	Department of Planning
NSW Maritime =	NSW Maritime Authority
DECC =	Department of Environment and Climate Change

Other stakeholders may also be involved, contribute to implementation, or have a concurrence role.

12.2.3.6 Priority

Each management action has been assigned a priority as follows:

- Priority 1 = Critical. The action will address an issue of public safety; or protect a highly valued natural/community resource which is at risk; or provide urgently required public infrastructure;
- Priority 2 = Moderate. The action will protect a highly valued natural/community resource which is not at immediate risk; or improve foreshore public infrastructure; and
- Priority 3 = Minor. The action will protect and improve foreshore natural resources/public infrastructure.

It should be noted that these priorities may change over time as new risks and issues become apparent. Additionally, Councils may find that addressing specific infrastructure projects as a whole rather than on a management zone basis may be more efficient. For example, the cycleway system in conjunction with the rehabilitation of seawalls. As noted in **Section 12.2**, actions and priorities in the following tables may also be superseded when or if additional information becomes available, community aspirations change, private sector investment opportunities arise or where more detailed plans of management are completed.

12.2.3.7 Timeframe

An indicative timeframe has been identified for each management action. This nominates a date to work towards for completing each action, based on assessment of currently available information.

12.2.3.8 Indicative Cost

An indicative capital cost of each management action is provided.

12.3 Whole of Foreshore

Management actions that apply to the whole of the foreshore are detailed in this section. The actions generally involve those which are required to be consistent along the entire foreshore and so will require co-operation and input from both Port Stephens and Great Lakes Councils, as well as a number of government agencies.

Management actions with the highest priority include the consideration of rezoning the foreshore areas to Foreshore Environmental Protection and/or developing an Estuary Foreshore DCP. This would enable the protection of significant ecological, recreational and aesthetic values. These recommendations feed into the current review of the LEP of both councils, to make their principal planning instruments consistent with the priorities of the Lower Hunter and Lower North Coast Regional Strategies and Conservation Plans and to apply consistent zonings throughout NSW.

Other Whole of Foreshore management actions include implementing a program of foreshore rehabilitation, beginning with a study that investigates the feasibility of reconstructing many of the foreshore protection structures in accordance with standard coastal engineering principles; disseminating information to the public about the range of foreshore reserves and waterway access facilities in order to reduce pressure on overcrowded areas such as Little Beach and distribute usage more evenly along the foreshore; and undertaking strategic and long term management action on Aboriginal heritage sites on a whole of foreshore basis.

The Port Stephens foreshore is a key locality for Port Stephens and Great Lakes Councils, in terms of potential risks associated with climate change and sea level rise. Neither Council currently has a clear understanding of the consequences of sea level rise on their estuarine foreshore assets. These consequences include the impacts of foreshore recession/erosion on parkland amenities, jetties, boat ramps, stormwater controls etc. and inundation of low lying foreshore reserve areas during high spring tides and/or storm events.

The Foreshore Management Plan therefore recommends that the councils investigate the risks associated with sea level rise and the vulnerability of the Port Stephens Foreshore in terms of capacity of systems and institutions to respond to those risks. Both Councils would follow this assessment with the preparation of policy statements to clarify their position on matters such as foreshore protection measures, new floor level requirements, design specifications for foreshore structures and foreshore vegetation management.

12.3.1 Identified Management Actions

Management Issue	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Aboriginal Heritage						
There are numerous Aboriginal heritage sites and archaeologically sensitive areas along the Port Stephens foreshore. There are also areas of mythological and contemporary significance to the local Aboriginal community. See Section 5.0 and Figure 5.1 .	1	Ensure that the development of new facilities/structures in public reserves takes the protection of Aboriginal heritage into consideration.	PSC, GLC, local Aboriginal communities	1	Immediate and ongoing	NA
As above.	2	Prepare and implement an Aboriginal Heritage Study and Management Plan.	PSC, GLC, DEC local Aboriginal communities	1	by end 2010	50000
Ecological Habitat						
A considerable number of threatened flora and fauna species have been sighted along the foreshore (Atlas of NSW Wildlife). See Sections 4.1.2 and 4.1.3 and Figures 5.4 and 5.5 in Foreshore Reference Document).	3	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC, GLC	1	Immediate and ongoing	NA
Seagrass beds fringe the majority of the Port Stephens foreshore and are an important ecological habitat. See Section 4.1.6 and Figure 4.3 .	4	Ensure compliance with relevant legislation e.g. <i>EP&A Act 1979</i> , <i>Fisheries Management Act 1994</i> , <i>TSC Act 1995</i> .	PSC, GLC, Dept of Primary Industries (Fisheries)	1	Immediate and ongoing	NA

Management Issue	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological habitat (continued)						
The remaining riparian vegetation along the foreshore is significant because it includes stands of ecologically endangered communities (see Section 4.1.4 and Figure 4.2) and preferred and supplementary koala habitat (see Section 4.1.10 and Figure 5.2 in Foreshore Reference Document). It also provides connectivity between foreshore habitats and landward habitats (particularly along the northern foreshore) (see Section 4.1.7).	5	Continue to support community groups and owners of private land to undertake bushland rehabilitation and enhancement projects.	PSC, GLC, Dept of Lands	1	Immediate and ongoing	varying
As above.	6	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC, GLC, Department of Lands	1	Immediate and ongoing	NA
As above.	7	Implement relevant management recommendations made in Comprehensive Koala Plan of Management (Port Stephens LGA). For example expand the information provided on Section 149 certificates to reflect the presence of koala habitat; provide more appropriate dog exercise areas.	PSC	2	by end 2010	NA
As above.	8	Prepare and implement Comprehensive Koala Plan of Management for Great Lakes LGA.	GLC, DECC	1	by end 2010	60000

Management Issue	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological habitat (cont)						
There are many important estuarine wetlands along the Port Stephens foreshore. These are important for biodiversity and ecosystem function.	9	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979, TSC Act 1995, EPBC Act 1999</i> and relevant SEPPs.	PSC, GLC, Department of Lands	1	Immediate and ongoing	NA
As above.	10	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
European Heritage						
There are a number of European heritage sites located around the Port Stephens foreshore. See Section 6.0 and Figure 6.1 .	11	Implement recommendations made in Great Lakes Heritage Study	GLC	3	by end 2012	NA
As above.	12	Prepare and implement a regional European Heritage Study and Management Plan (Port Stephens LGA).	PSC	3	by end 2012	50000
Foreshore Reserves and Facilities						
Councils Generic Foreshores Plan of Management does not cover all relevant issues.	13	Incorporate additional issues such as Aboriginal heritage, European heritage, foreshore protection, visual amenity (see Section 8.12.2).	PSC, GLC	3	Update generic Plan by end 2009	500

Management Issue	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)						
Current zoning of the foreshore does not take the unique combination of ecological recreational and aesthetic values of the foreshore into consideration. See Sections 8.1.1 - 8.1.6 and 8.12.1 .	14	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.5 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	PSC, GLC, Dept Planning	1	by end 2017	NA
Many foreshore car parks are congested during peak periods. See Section 8.5 .	15	Identify suitable temporary overflow car parking areas away from foreshore reserves. See Section 8.5 .	PSC	2	by end 2010	5000
Many sections of the foreshore with important ecological recreational and aesthetic values are privately owned. The long term conservation of these values is therefore relatively uncertain. See Sections 8.1.2-8.1.6 and 8.12.1 .	16	Explore the potential for government acquisition of privately owned foreshore land which has values that should be managed for the long term. See Sections 8.1.2-8.1.5 and 8.12.1 . Also see Figure 8.2 .	PSC, GLC, Dept Planning, various other govt agencies	2	by end 2022	NA
No formal guidelines are in place regarding the impact of maintenance activities on ecological and Aboriginal heritage values.	17	Establish and implement Parks and Reserves Maintenance Guidelines. See Appendix 4 for content.	PSC, GLC, local Aboriginal communities, volunteer groups	2	by end 2010	2000
Usage of foreshore reserves could be distributed more evenly along the Port Stephens foreshore. See Section 8.4 .	18	Disseminate information about the range of foreshore reserves along the shoreline through Council and community newsletters advertising in the local media and through the production of appropriate tourist information and signage.	PSC, GLC	1	by end 2010	20000

Management Issue	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)						
Many existing foreshore structures are unauthorised and/or have not been built in accordance with standard coastal engineering principles.	19	Investigate the feasibility of reconstructing foreshore protection structures in accordance with standard coastal engineering principles. This should form part of a program of foreshore rehabilitation that considers public access, and other issues such as landscaping.	PSC, GLC, Dept Lands, MPA	1	by end 2017	100000
Neither Port Stephens Council nor Great Lakes Council currently has a clear understanding of the exposure and vulnerability of the foreshore to the impacts of climate change and sea level rise.	20	Prepare study of estuary foreshore vulnerability in terms of the impacts of climate change and sea level rise hazards, including inundation, ecological character, stormwater management, structural integrity of structures and foreshore erosion/recession. Based on the results of the vulnerability study, identify new or modified management actions and prepare policy statements to clarify Council's position on appropriate responses.	PSC and GLC, with support from DECC, Department of Lands and Department of Planning	1	In progress - Study should be completed during 2009	100,000

Management Issue	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity						
The visual amenity of the Port Stephens foreshore is affected by visually obtrusive public amenity blocks, signage, stormwater outlets, foreshore structures and urban development. See Section 7.2 .	21	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline to give effect to sustainability principles. Enforce LEP provisions that address visual amenity.	PSC, GLC, Dept of Planning, Department of Lands	2	Immediate and ongoing	NA
As above.	22	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.5 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	PSC, GLC, Dept Planning	1	by end 2017	NA
As above.	23	Explore the potential for government acquisition of privately owned foreshore land which has values that should be managed for the long term. See Sections 8.1.2-8.1.5 and 8.12.1 . Also see Figure 8.2 .	PSC, GLC, Dept Planning	2	by end 2022	NA
As above.	24	Investigate methods of screening stormwater outlets and/or installing alternatives such as artificial wetlands. See Section 7.2.4 .	PSC, GLC, CMA, MPA	3	by end 2010	5000
As above.		See Management Actions with regard to foreshore structures for each Management Zone.				

Management Issue	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity (cont)						
As above.		See Management Actions with regard to public amenities for each Management Zone.				
As above.	25	Undertake a review of signage along the foreshore with a view to reducing the overall number of signs standardising their design and locating them in more appropriate locations. See Section 7.2.7 .	PSC, GLC, NSW Maritime, MPA, DECC, Dept Lands	2	by end 2012	80000
Water Quality						
Stormwater has the potential to affect the water quality of Port Stephens. See Section 11.2 and Figure 11.1 .	26	Continue Clean Waterways Program.	PSC	1	Immediate and ongoing	80000/annum
As above.	27	Implement recommendations made in Urban Stormwater and Rural Water Quality Management Plan (Port Stephens LGA). For example the recommendations regarding the conversion of piped outlets to wetland areas in the Lemon Tree Passage and Tanilba Bay areas and the installation of litter traps.	PSC, CMA, MPA	1	by end 2010	NA

Management Issue	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Waterway Access and Facilities for Boat Users						
A dry boat storage area(s) is required in Port Stephens. See Section 9.1.4 .	28	Identify sites around the estuary that are suitable for future dry boat storage. In the first instance, investigate feasibility of dry boat storage area(s) within existing marinas along the Tilligerry Creek foreshore in the Bundabah/North Arm Cove area or in the Tea Gardens area.	PSC, GLC, NSW Maritime Department of Lands	2	by end 2010	5000
Another marina(s)/slipway(s) will eventually be required in Port Stephens. See Section 9.1.4 .	29	Develop criteria for strategic planning of potential new marinas. In the first instance, investigate feasibility of new marina(s)/slipway(s) at Cromartys Bay in the Bundabah/North Arm Cove area and in the Tea Gardens area.	PSC, GLC, NSW Maritime, Department of Lands	2	by end 2010	5000
Many boat ramps often become difficult to use due to sand coverage and algal growth.	30	Maintain boat ramps regularly. Ensure minimal buildup of sand and algae.	PSC, GLC	1	Immediate and ongoing	2000
Signage at boat ramps is in poor condition and inconsistent.	31	Upgrade and standardise signage at all boat ramps. Provide instructions regarding the efficient use of each boat ramp general regulations and information about alternative facilities.	PSC, GLC, NSW Maritime, MPA	2	by end 2010	30000
Some boat ramps are congested during peak periods; others have the potential to be used more intensively.	32	Disseminate information about the range of waterway access facilities available through Council and community newsletters advertising in the local media tourist information and signage.	PSC, GLC, NSW Maritime	1	by end 2010	20000

Management Issue	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Waterway Access and Facilities for Boat Users (cont)						
As above.	33	Install classified traffic counters at all boat ramps/car parks during a peak period and a non-peak period.	PSC, GLC	1	by end 2010	15000
Increased popularity of boating is putting increased pressure on resources	34	Develop a boating infrastructure strategy	PSC, GLC, NSW Maritime, MPA, Department of Lands	2	By end of 2010	n/a

12.4 Tomaree Headland to Nelson Bay (Management Zone A1)

12.4.1 Summary

The main issues identified in this management zone are:

- a number of Aboriginal sites require pro-active management;
- the Little Beach Boat Ramp is overcrowded during peak periods;
- Nelson Bay Harbour amenity requires improvement;
- the facilities and landscaping in many foreshore reserves require improvement;
- the majority of car parks in the foreshore area are below standard; and
- there is significant remnant terrestrial, riparian and wetland vegetation in the foreshore area.

The section of foreshore between Tomaree Headland and Nelson Bay is one of the most intensively utilised and well known areas of Port Stephens. Much of the foreshore has been cleared, however there are pockets of important remnant vegetation. For example, the terrestrial vegetation within Anzac Park is one of only a few areas where terrestrial dune type vegetation remains in a dune succession situation directly behind a foredune. Council is currently upgrading the car park and facilities in the area and managing the unique vegetation in partnership with a local community group. The Shoal Bay wetland is also an important freshwater habitat supporting unique flora and fauna species. An ecological study and management plan would assist in ensuring that the area is conserved and managed appropriately.

A number of Aboriginal scarred trees are located within this management zone and are in need of pro-active management. This could form part of a regional management study and plan for Aboriginal heritage.

Many of the recreational and waterway access facilities within this management zone require improvements. The Little Beach Boat Ramp area is overcrowded in peak periods which leads to disagreements between ramp users and potential risks to public safety. While minor upgrades to the ramp may improve its functionality and capacity, more evenly distributing the use of boat ramp facilities around the length of the foreshore is considered the optimal long term option.

A number of management options were identified in the Port Stephens and Myall Lakes Estuary Management Plan (2000) to improve the amenity of Nelson Bay Harbour, including the employment of a caretaker to regularly clear gross pollutants, and be responsible for the visual monitoring of oils slicks, among other tasks. These recommendations have been considered in preparing the Foreshore Management Plan.

The Nelson Bay foreshore area is Crown land. A Plan of Management was completed early in 2008 and Department of Lands is now seeking Expressions of Interest to commence implementation. The Plan will be implemented in partnership with Port Stephens Council, integrating foreshore management around the harbour with other strategic planning for the Nelson Bay town centre and the wider Tomaree Peninsula. The Plan of Management details proposed redevelopment and revitalisation of the boat harbour area with the aim of protecting environmental values while encouraging tourism and economic investment in the region. Investment in this economic and tourism hub will assist the Department of Lands in conserving and managing other public land.

A Master Planning project for the Corlette to Shoal Bay area is about to commence.

This Foreshore Management Plan makes several recommendations that should be further explored and refined during the Master Planning process. The unique visual amenity of Management Zone A1 could be improved through an upgrade of a number of public facilities on the foreshore. For example, the amenities blocks at the eastern and western ends of Shoal Bay beach are visually obtrusive and in need of maintenance. These could be replaced and located away from the immediate foreshore. It should also be noted here that the visual amenity enjoyed from this management zone is in a large part brought about by the lack of urban development on the northern shoreline.

12.4.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Aboriginal Heritage								
There are a number of scarred trees located at the eastern end of the Shoal Bay foreshore. One of these is being undermined by erosion and others are being affected by termites.	A1_2	Scarred trees – Shoal Bay.	35	Local Aboriginal community, PSC and NPWS plan management strategy and undertake in partnership.	PSC, DECC, local Aboriginal community	2	by end 2010	20000
Ecological Habitat								
Shoal Bay Wetland is an important freshwater habitat. This is a SEPP14 wetland and may comprise an EEC. Preferred koala habitat occurs within the area.	A1_3	Shoal Bay Wetland.	36	Continue to support community groups undertaking bushland rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	varying
As above.	A1_3	Shoal Bay Wetland.	37	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
As above.	A1_3	Shoal Bay Wetland.	38	Prepare a Plan of Management to allow for continued use by Hunter Water whilst ensuring the protection of ecological values.	DECC, , Hunter Water	1	by end 2012	30000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
The Fly Point/Halifax Park aquatic area is an important ecological asset. It is listed on the Register of the National Estate for its ecological importance.	A1_5	Fly Point – Halifax Park aquatic habitat.		No specific management recommendation. The aquatic area is now part of the Marine Park.				
The riparian vegetation between Little Beach and Fly Point is significant remnant vegetation. Remnant stands of the EEC Swamp Sclerophyll Forest on Coastal Floodplains occur in the area. The area also includes preferred koala habitat.	A1_8	Riparian vegetation between Little Beach and Fly Point.	39	Continue to support community groups undertaking bushland rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	varying
As above.	A1_8	Riparian vegetation between Little Beach and Fly Point.	40	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	A1_8	Riparian vegetation between Little Beach and Fly Point.	41	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
The riparian vegetation on Nelson Head is significant remnant vegetation. This area has been identified as supplementary koala habitat.	A1_7	Riparian vegetation on Nelson Head.	42	Continue to support community groups undertaking bushland rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	varying
As above.	A1_7	Riparian vegetation on Nelson Head.	43	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
As above.	A1_7	Riparian vegetation on Nelson Head.	44	Incorporate additional issues such as Aboriginal heritage, European heritage, foreshore protection, visual amenity (see Section 8.12.2) into Council's Generic Foreshores Plan of Management.	PSC	3	by end 2009	500
The terrestrial vegetation within Anzac Park is one of only a few areas where the terrestrial dune type of vegetation remains in a dune succession situation directly behind the beach foredune. The park has also been identified as supplementary koala habitat.	A1_9	Terrestrial vegetation within Anzac Park.	45	Continue to support community groups undertaking bushland rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	varying

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
As above.	A1_9	Terrestrial vegetation within Anzac Park.	46	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
Foreshore Reserves and Facilities								
Central Shoal Bay Foreshore Reserve car parking area is below standard.	A1_13	Central Shoal Bay Foreshore Reserve car park.	47	Seal/formalise car park. Minimise size of car park. Landscape with appropriate native trees	PSC	3	by end 2012	40000
Eastern Shoal Bay Foreshore Reserve car parking area is below standard.	A1_14	Eastern Shoal Bay Foreshore Reserve car park.	48	Formalise car park. Incorporate spaces for small boat trailers as well as single vehicle spaces.	PSC	2	by end 2012	40000
Nelson Bay Foreshore car parking is congested during peak periods.	A1_20	Nelson Bay foreshore car parking areas.	49	Continue to enforce Councils Foreshore Parking Strategy.	PSC	1	Immediate and ongoing	NA
The existing pathways/cycleways could be extended to allow access along the entire foreshore of this management zone.	A1_15	Existing pathways/cycleways.	50	Implement relevant section of Councils Proposed Cycleways and Footpaths (2006).	PSC	3	by end 2012	60000
The facilities and landscape of Eastern Shoal Bay Foreshore Reserve require improvement.	A1_18	Eastern Shoal Bay Foreshore Reserve and facilities (public amenities, picnic tables with shelter).	51	Demolish and replace existing amenities. Replacement amenities should be located on southern side of Shoal Bay Road.	PSC	3	by end 2012	200000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
As above.	A1_18	Eastern Shoal Bay Foreshore Reserve and facilities (public amenities, picnic tables with shelter).	52	Improve general landscaping. Include appropriate plantings.	PSC	3	by end 2010	5000
The facilities and landscaping of the central section of Shoal Bay Foreshore Reserve (central village section) require improvement.	A1_16	Shoal Bay Foreshore Reserve (central village section) and facilities (public amenities, picnic tables, 2 coin operated barbecues, 2 cold showers, taps/bubbler).	53	Demolish and replace existing amenities. Consider locating replacement amenities in car park (corner of Shoal Bay and Government Roads)	PSC	3	by end 2012	200000
As above.	A1_16	Shoal Bay Foreshore Reserve (central village section) and facilities (public amenities, picnic tables, 2 coin operated barbecues, 2 cold showers, taps/bubbler).	54	Improve general landscaping. Include appropriate plantings.	PSC	2	by end 2010	5000
As above.	A1_16	Shoal Bay Foreshore Reserve (central village section) and facilities (public amenities, picnic tables, 2 coin operated barbecues, 2 cold showers, taps/bubbler).	55	Install children's playground at western end.	PSC	2	by end 2012	20000
The facilities and landscaping of the Nelson Bay Foreshore Reserve and facilities require improvement.	A1_21	Nelson Bay Foreshore Reserve (public amenities children's playground).	56	Implement Nelson Bay Foreshore Plan of Management.	Dept Lands, PSC	2	In accordance with timeframes agreed in the Plan of Mgt	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
The facilities and landscaping of the Western Shoal Bay Foreshore Reserve/Anzac Park require improvement.	A1_19	Western Shoal Bay Foreshore Reserve/Anzac Park.	57	Implement plans for road construction car park public amenities and picnic facilities in Anzac Park.	PSC	1	by end 2010	405000
The Little Beach car park is below standard.	A1_12	Little Beach car park.	58	Consider parking controls such as staff on busy weekends and parking meters in the long term.	PSC	2	by end 2010	NA
As above.	A1_12	Little Beach car park.	59	Re-design and upgrade Little Beach car park.	PSC	1	by end 2010	40000
The western side of Nelson Head foreshore is currently used as an informal car park by scuba divers. This is having a negative impact on riparian vegetation visual amenity and possibly the adjacent Aquatic Reserve.			60	Formalise/seal car park.	PSC	2	by end 2012	40000
Foreshore Stability								
Shoal Bay Beach suffers from a long term erosion problem.			61	In liaison with MPA continue to implement sand nourishment program regularly.	PSC, MPA	1	Immediate and ongoing	30000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity								
The visual amenity of Nelson Bay Harbour and Foreshore requires improvement.			62	Implement Nelson Bay Foreshore Plan of Management.	Dept Lands, PSC	2	In accordance with timeframes agreed in the Plan of Mgt	NA
As above.			63	Implement the Plan of Management for Nelson Bay Boat Harbour. Pursue options to improve water circulation and exchange.	PSC, Dept of Lands, NSW Maritime, MPA, PSC	1	In accordance with timeframes agreed in the Plan of Mgt	40000
The visual amenity of this management zone is threatened by visually obtrusive public amenity blocks, signage, stormwater outlets, the erosion of Shoal Bay Beach, Nelson Bay Harbour and urban development.			64	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline. Give effect to sustainability principles in planning decisions and protect the visual amenity of the foreshore.	PSC, Dept Planning	2	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity (cont)								
As above.			65	In liaison with MPA, continue to implement beach nourishment program regularly enough so that a steep erosion scarp is not allowed to develop.	PSC, MPA	2	Immediate and ongoing	30000
As above.			66	Investigate methods of screening stormwater outlets and/or installing alternatives such as artificial wetlands. See Section 7.2.4 .	PSC, CMA, MPA	3	by end 2010	5000
There have been instances of tree vandalism in the Nelson Bay area.			67	Discourage vandalism by installing long term flagging or other material type which obstructs view as effectively as former tree(s). Plant replacement trees immediately. Implement tree vandalism policy (Hunter Councils).	PSC	2	Ongoing	NA
Waterway Access and Facilities for Boat Users								
Nelson Bay Harbour water quality and amenity requires improvement.	A1_29	Nelson Bay Harbour.	68	Implement Plan of Management for Nelson Bay Boat Harbour. Pursue options to improve water circulation and exchange.	PSC, Dept of Lands, NSW Maritime, MPA	1	In accordance with timeframes agreed in the Plan of Mgt	40000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Waterway Access and Facilities for Boat Users (cont)								
Regular audits of D'Albora Marina and slipway are currently not undertaken.	A1_31	D'Albora Marina.	69	Undertake environmental audit. A strict timetable to rectify non-compliance should be enforced.	PSC	1	by end 2010	5000
Regular audits of Little Beach Marina and slipway are currently not undertaken.	A1_30	Little Beach Marina.	70	Undertake environmental audit. A strict timetable to rectify non-compliance should be enforced.	PSC	1	by end 2010	5000
The existing dinghy racks have inadequate capacity and are visually obtrusive.	A1_24	Shoal Bay dinghy racks (2) (central area).	71	Install dinghy rack with higher capacity and in visually unobtrusive location.	PSC	3	by end 2012	2000
The Little Beach Ramp is overcrowded during peak periods. The ramp is dangerous to use in certain conditions.	A1_28	Little Beach Boat Ramp.	72	Investigate the feasibility of a pontoon structure adjacent to the boat ramp. This may improve the functionality and capacity of the ramp.	PSC, NSW Maritime	2	by end 2010	5000
The Shoal Bay Boat Ramp is overcrowded during peak periods. The ramp is relatively short and difficult to use in windy conditions.	A1_27	Shoal Bay Boat Ramp.	73	Upgrade Shoal Bay Boat Ramp. Encourage the use of the facility by motorised sports craft (jet skiers) and other small motorcraft.	PSC, NSW Maritime, MPA	2	by end 2010	40000
The Shoal Bay Jetty requires an upgrade.	A1_25	Shoal Bay Jetty.	74	Upgrade jetty.	PSC	2	by end 2012	200000

12.5 Nelson Bay to Corlette Point (Management Zone A2)

12.5.1 Summary

The main issues identified in this management zone are:

- the rock revetments and sea walls that line the foreshore of Sandy Point are not constructed according to standard coastal engineering principles and they present a public hazard due to their height. Many structures also hinder public access;
- the eastern end of Corlette Beach is suffering from erosion while a large volume of sand has accumulated at the western end against the marina breakwall;
- the area contains significant remnant vegetation; and
- the facilities and landscaping in many foreshore reserves requires improvement.

The main issue in this management zone is the rock revetments and seawalls at Sandy Point which are not constructed appropriately. This public section of the foreshore is popular with walkers and so an investigation into reconstructing the seawalls, removing structures that hinder public access, and improving public safety should be urgently undertaken. A beach nourishment program involving the transportation of sand from the western end to the eastern end of Corlette beach would address the erosion/sedimentation problem that affects the beach.

Bagnalls Beach Reserve and Corlette Point Reserve contain significant remnant vegetation which has been identified as supplementary and preferred koala habitat. The areas are managed by Council and very active and concerned community groups. Bagnalls Beach has the potential to be more intensively used and so help to reduce the pressure on foreshore reserves in Management Zone 1. Additionally, the western end of Bagnalls Beach is suitable for more intensive use by passive watercraft. A management plan should initially be prepared for the area to ensure both the conservation and optimal use of the Reserve.

Many of the recreational facilities in this management zone, including toilet blocks, require replacement or upgrade. Additionally, the car parks in Bagnalls Beach Reserve could be upgraded and the space rationalised to provide more usable and aesthetic public space.

Similar to Management Zone 1, the visual amenity enjoyed from this shoreline is largely brought about by the undeveloped nature of the opposite northern shoreline.

12.5.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
The riparian vegetation in Bagnalls Beach Reserve is significant remnant vegetation. This has been identified as supplementary koala habitat.	A2_1	Riparian vegetation in Bagnalls Beach Reserve.	75	Continue to support community groups undertaking rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	varying
As above.	A2_1	As above.	76	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
As above.	A2_1	As above.	77	Prepare management plan for the use and conservation of Bagnalls Beach Reserve.	PSC	2	by end 2010	30000
The riparian vegetation in Corlette Point Reserve is significant remnant vegetation. It contains a stand of Swamp Oak Floodplain Forest EEC and preferred koala habitat.	A2_2	Riparian vegetation in Corlette Point Reserve.	78	Continue to support community groups undertaking rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	varying
As above.	A2_2	As above.	79	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
As above.	A2_2	Riparian vegetation in Corlette Point Reserve.	80	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
As above.	A2_2	As above.	81	Prepare management plan for the use and conservation of Corlette Point Reserve.	PSC	2	by end 2010	10000
The riparian vegetation on West Point is significant remnant vegetation. It contains a narrow strip of the Swamp Sclerophyll Forest on Coastal Floodplains EEC.	A2_4	Riparian vegetation on West Point.	82	Continue to support community groups undertaking bushland rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	varying
Foreshore Reserves and Facilities								
Bagnalls Beach Reserve (Eastern End Central Section and Western End) and Conroy Park have the potential to be intensively utilised.			83	Disseminate information about the range of foreshore reserves along the shoreline through Council and community newsletters advertising in the local media and through the production of appropriate tourist information and signage.	PSC	1	by end 2010	20000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
Bagnalls Beach Reserve (Western End) car park is below standard.	A2_17	Bagnalls Beach Reserve (Western End) car park.	84	Formalise car park and rationalise car park space. Incorporate appropriate parking for vehicles carrying passive watercraft.	PSC	2	by end 2012	40000
Bagnalls Beach Reserve car park (Central Section) is below standard.	A2_13	Bagnalls Beach Reserve (Central Section) car park.	85	Formalise car park and rationalise car park space.	PSC	2	by end 2012	40000
Bagnalls Beach Reserve car park (Eastern End) is below standard.	A2_10	Bagnalls Beach Reserve (Eastern End) car park.	86	As above.	PSC	2	by end 2010	40000
Public access (particularly disabled access) is inhibited by private foreshore structures around Sandy Point. These structures also pose a danger to public safety.			87	Investigate feasibility of constructing a pathway/cycleway along the foreshore of Sandy Point (extending between Bagnalls Beach Reserve and Corlette Point). Implement relevant section of Councils Proposed Cycleways and Footpaths (2006) if access around Sandy Point is found not to be feasible.	PSC	2	by end 2010	5000
The Bagnalls Beach off-leash dog exercise area may be causing local water quality problems.			88	Continue to monitor use of dog off leash areas and undertake community education on responsible pet ownership. .	PSC	2	by end 2010	2000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
The existing pathways/cycleways could be extended to allow access along the entire foreshore of this management zone.	A2_14	Existing pathways/cycleways.	89	Construct Bagnalls Beach cycleway.	PSC	2	by end 2012	pending
As above.	A2_14	As above.	90	Investigate feasibility of constructing a pathway/cycleway along the foreshore of Sandy Point (extending between Bagnalls Beach Reserve and Corlette Point). Implement relevant section of Councils Proposed Cycleways and Footpaths (2006) if access around Sandy Point is found not to be feasible.	PSC	2	by end 2010	5000
The facilities in Conroy Park require improvement.	A2_15	Conroy Park and facilities.	91	Upgrade public amenities. Design to be as visually unobtrusive as possible.	PSC	3	by end 2012	80000
The landscaping and facilities of Bagnalls Beach Reserve (Central Section) require improvement.	A2_11	Bagnalls Beach Reserve (Central Section) and facilities (public amenities picnic tables).	92	Continue support for community groups to undertake public reserve enhancement projects.	PSC	1	Immediate and ongoing	1000
As above.	A2_11	As above.	93	Demolish and replace existing public amenities. Design facilities to be as visually unobtrusive as possible.	PSC	2	by end 2012	200000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
As above.	A2_11	Bagnalls Beach Reserve (Central Section) and facilities (public amenities picnic tables).	94	Improve landscaping to encourage the more intensive use of the area by picnickers. Install BBQs.	PSC	2	by end 2010	20000
As above.	A2_11	As above.	95	Prepare management plan for the use and conservation of Bagnalls Beach Reserve.	PSC	2	by end 2010	30000
The landscaping and facilities of Bagnalls Beach Reserve (Eastern End) require improvement.	A2_9	Bagnalls Beach Reserve (Eastern End) and facilities (public amenities children's playground BBQS picnic tables taps).	96	Continue support for community groups to undertake public reserve enhancement projects.	PSC	1	Immediate and ongoing	1000
As above.	A2_9	As above.	97	Demolish and replace existing public amenities. Design facilities to be as visually unobtrusive as possible.	PSC	3	by end 2012	200000
As above.	A2_9	As above.	98	Improve landscaping to encourage the more intensive use of the area by picnickers.	PSC	2	by end 2010	15000
As above.	A2_9	As above.	99	Prepare management plan for the use and conservation of Bagnalls Beach Reserve.	PSC	2	by end 2010	30000
The landscaping and facilities of Bagnalls Beach Reserve (Western End) require improvement.	A2_12	Bagnalls Beach Reserve (Western End) and facilities (picnic tables children's playground).	100	Continue support for community groups to undertake public reserve enhancement projects.	PSC	1	Immediate and ongoing	1000
As above.	A2_12	As above.	101	Install public amenities (including showers). Design facilities to be as visually unobtrusive as possible.	PSC	2	by end 2012	200000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
As above.	A2_12	Bagnalls Beach Reserve (Western End) and facilities (picnic tables children's playground).	102	Landscape area so that it is suitable for use by passive watercraft. Formalise walkway to allow easy access of watercraft between car park and beach. Ensure adequate erosion control strategies are in place.	PSC	1	by end 2012	20000
As above.	A2_12	As above.	103	Prepare management plan for the use and conservation of Bagnalls Beach Reserve.	PSC	2	by end 2010	30000
The landscaping of West Point requires improvement.	A2_7	West Point.	104	Continue support for community groups to undertake rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	1000
Foreshore Stability								
Ocean swell impinges on the foreshore of Sandy Point causing erosion. Rock revetment and numerous seawalls have consequently been constructed but these do not meet standard coastal engineering principles.			105	Investigate feasibility of reconstructing seawalls and rock revetment in accordance with sound coastal engineering principles.	PSC, Dept of Lands, private residents	1	by end 2010	100000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Stability (cont)								
The eastern end of Corlette Beach is suffering from erosion while a large volume of sand has accumulated at the western end against the marina breakwall.			106	Investigate feasibility of reconstructing the rock revetment at the eastern end of the beach and implementing a program of beach nourishment through trucking sand from the western end to the eastern end.	PSC Anchorag e Marina, MPA, Dept of Lands	1	by end 2010	20000
The existing rock revetment and seawalls present a public hazard due to their height and lack of safety rail. Many structures also hinder public access.			107	Investigate removal/alteration of structures which hinder access through the public foreshore reserve. Investigate the installation of hand rails and other safety requirements.	PSC, Dept of Lands, private residents	1	by end 2010	20000
Visual Amenity								
The visual amenity of this management zone is threatened by visually obtrusive public amenity blocks, signage, stormwater outlets, urban development, foreshore erosion and structures.			108	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline. Give effect to sustainability principles in development assessment decisions. Develop and implement design guidelines (visual as well as structural) for foreshore structures.	PSC, Dept Planning	2	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity (cont)								
As above.			109	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.5 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	PSC, Dept Planning, Dept Lands	1	by end 2017	NA
As above.			110	Investigate methods of screening stormwater outlets and/or installing alternatives such as artificial wetlands. See Section 7.2.4 .	PSC, CMA, MPA	3	by end 2010	5000
As above.			111	Undertake a review of signage along the foreshore with a view to reducing the overall number of signs standardising their design and locating them in more appropriate locations. See Section 7.2.7 .	PSC, GLC NSW Maritime MPA, DECC, Dept Lands	2	by end 2012	80000
The off-leash dog exercise area at Bagnalls Beach may be contributing to faecal contamination.			112	Continue to monitor dog off leash areas and undertake community education on responsible pet ownership.	PSC	2	by end 2010	2000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Waterway Access and Facilities for Boat Users								
Regular auditing of the Anchorage Marina is not currently undertaken.	A2_22	The Anchorage Marina.	113	Undertake environmental audit. A strict timetable to rectify non-compliance should be enforced.	PSC	1	by end 2010	5000
The existing dinghy rack has inadequate capacity.	A2_20	Dutchies Beach dinghy rack.	114	Install dinghy rack with greater capacity. Install in a visually unobtrusive location.	PSC	3	by end 2012	2000
The western end of Bagnalls Beach is suitable for more intensive use by passive watercraft.			115	Disseminate information that encourages passive watercraft users to launch from Bagnalls Beach. Use Council and community newsletters advertising in the local media appropriate tourist information and signage.	PSC	1	by end 2010	20000
As above.			116	Landscape area so that it is suitable for use by passive watercraft. Formalise walkway to allow easy access of watercraft between car park and beach. Ensure adequate erosion control strategies are in place.	PSC	1	by end 2012	20000

12.6 Corlette Point to Soldiers Point (Management Zone A3)

12.6.1 Summary

The main management issues identified in this Management Zone are:

- Mambo Wetland which is an important estuarine habitat and contains two Ecologically Endangered Communities;
- public access which is discouraged by the private appearance of the public foreshore reserve in some area. Access is also hindered in some areas by illegal structures such as boat ramps;
- many existing seawalls and rock revetments are not approved and have not been built in accordance with standard coastal engineering principles;
- the waterway access facilities (including reserves accessible to boat based visitors) have the potential to be used more intensively; and
- the facilities and landscaping in many foreshore reserves requires improvement.

Mambo Wetland forms a large component of this Management Zone. A Plan of Management has been completed for the area and contains recommendations such as upgrading the walking tracks throughout the reserve, installing locked gates at all vehicle access points and installing signage to emphasise the reasons for restricted access.

Public access through a number of public reserves in this Management Zone is discouraged by the 'private' appearance of the area, e.g. the western foreshore of Salamander Bay and the eastern foreshore of Soldiers Point (north of Kangaroo Point). Additionally, access is hindered in some areas by privately built structures. Identified management actions include investigating the feasibility of pathways/cycle ways along these areas, and installing signage to indicate that public access is permitted. More details of Port Stephens Council's approach to cycle ways can be found in the Port Stephens Council Proposed Cycle Ways and Footpaths document and in Council's Assessment and Maintenance of Footpaths and Cycle Ways document (Council policy adopted 27/11/2001).

The reconstruction of many of the existing rock revetments and seawalls in Management Zone A3 could also be investigated, since many have not been constructed appropriately. The sandy beaches which once would have existed in some of these areas have consequently eroded away. This issue could be addressed as part of a foreshore rehabilitation program that not only addresses foreshore stability but also issues such as public access and landscaping.

The Salamander Bay Boat Ramp is a local boat ramp that could be made more user friendly by installing a pontoon adjacent to the existing wharf. This would improve the functionality and safety of the boat ramp (the ramp is exposed to high winds and waves in some conditions) and may contribute to distributing usage of waterway access facilities more evenly around the foreshore. Disseminating information about the public reserves in this area (particularly to boat based picnickers/swimmers) may also contribute to reducing the pressure on areas in Management Zone 1.

12.6.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
Mambo Wetland is an important estuarine habitat. This is a SEPP14 wetland that contains a large area of the Freshwater Wetlands on Coastal Floodplains EEC and a small patch of Swamp Sclerophyll Forest on Coastal Floodplains EEC. Areas of both preferred and supplementary koala habitat also occur.	A3_1	Mambo Wetland.	117	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	A3_1	Mambo Wetland.	118	Implement recommendations made in Mambo Wetland Plan of Management.	PSC	1	Immediate and ongoing	NA
As above.	A3_1	Mambo Wetland.	119	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
As above.	A3_1	Mambo Wetland.	120	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
There are small patches of remnant vegetation along the eastern foreshore of Soldiers Point. These include two remnants of the Swamp Sclerophyll Forest on Coastal Floodplains EEC and small patches of preferred koala habitat.	A3_4	Remnant vegetation along the eastern foreshore of Soldiers Point.	121	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	A3_4	Remnant vegetation along the eastern foreshore of Soldiers Point.	122	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
Foreshore Reserves and Facilities								
Public access (particularly disabled access) is discouraged by the private appearance of the public foreshore reserve in some areas. Access is also hindered in some areas by structures built across public reserve. See Section 8.3 and Figure 8.3 .			123	Construct pathway between Wanda Headland and George Reserve, including provision for a shared cycleway in the proposed pathway.	PSC	2	by end 2012	30000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
As above.			124	Investigate feasibility of pathway along western foreshore of Salamander Bay (Joe Redman Reserve to Wanda Head). If pathway not feasible erect signage to indicate that public access is welcome along foreshore.	PSC	2	by end 2012	1000
As above.			125	Investigate feasibility of removing/altering structures which hinder public access.	PSC, Dept of Lands, private residents	2	by end 2012	20000
As above.			126	Investigate the feasibility of a pathway along the eastern foreshore of Soldiers Point (between George Reserve and Soldiers Point Boat Ramp). If pathway is found not to be feasible maintain informal public access through signage.	PSC	2	by end 2012	1000
Roy Wood Reserve car park is below standard.	A3_7	Roy Wood Reserve car park	127	Formalise car park and rationalise car park space.	PSC	2	by end 2017	40000
The existing pathways/cycleways could be extended to allow access along the entire foreshore of this management zone.	A3_9	Existing pathways/cycleways.	128	Construct pathway between Wanda Headland and George Reserve, including provision for a shared cycleway in the proposed pathway.	PSC	2	by end 2012	30000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
As above.	A3_9	Existing pathways/cycleways.	129	Investigate feasibility of pathway along western foreshore of Salamander Bay (Joe Redman Reserve to Wanda Head). If pathway not feasible erect signage to indicate that public access is welcome along foreshore.	PSC	2	by end 2012	1000
As above.	A3_9	Existing pathways/cycleways.	130	Investigate the feasibility of a pathway along the eastern foreshore of Soldiers Point (between George Reserve and Soldiers Point Boat Ramp). If pathway is found not to be feasible maintain informal public access through signage.	PSC	2	by end 2012	1000
The facilities in Corlette Headland Reserve require improvement.	A3_18	Corlette Headland Reserve.	131	Install picnic tables and seating.	PSC	3	by end 2012	4000
The landscaping and facilities of Bob Cairns Reserve require improvement.	A3_10	Bob Cairns Reserve and facilities (public amenities picnic tables children's playground).	132	Demolish and replace existing public amenities. Design and locate facilities to be as visually unobtrusive as possible.	PSC	3	by end 2012	140000
As above.	A3_10	As above.	133	Improve landscaping to encourage the more intensive use of the area by picnickers.	PSC	2	by end 2010	20000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
The landscaping and facilities of George Reserve require improvement.	A3_11	George Reserve and facilities (public amenities, picnic tables, BBQs, tap bubblers, children's playground).	134	Improve landscaping. Plantings in particular are required.	PSC	2	by end 2010	20000
As above.	A3_11	As above.	135	Install dinghy racks.	PSC	2	by end 2012	2000
As above.	A3_11	As above.	136	Upgrade amenities block. Design to be as visually unobtrusive as possible.	PSC	2	by end 2012	80000
The landscaping and facilities of Roy Wood Reserve require improvement.	A3_6	Roy Wood Reserve and facilities (public amenities picnic tables BBQ cold shower taps).	137	Demolish and replace existing public amenities. Locate new facilities away from immediate foreshore (northern edge of car park?).	PSC	2	by end 2017	80000
As above.	A3_6	As above.	138	Improve landscaping to encourage the more intensive use of the area by picnickers.	PSC	2	by end 2010	10000
As above.	A3_6	As above.	139	Install three new dinghy racks.	PSC	2	by end 2012	6000
The landscaping and facilities of the park on Soldiers Point Road Soldiers Point (Kangaroo Point) require improvement.	A3_12	Kangaroo Point Reserve and facilities (public amenities).	140	Install picnic tables and BBQs.	PSC	2	by end 2012	10000
Foreshore Stability								
A number of unauthorised structures have been built across public reserve and so hinder public access.			141	Investigate feasibility of removing/altering structures which hinder public access.	PSC, Dept of Lands, private residents	2	by end 2012	5000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Stability (cont)								
Many existing seawalls and rock revetments are unauthorised and/or have generally not been built in accordance with sound coastal engineering principles. These include Council built structures, e.g. Soldiers Point and private structures, e.g. Kangaroo Point and Sunset Beach.			142	Investigate the feasibility of reconstructing foreshore structures in accordance with sound coastal engineering principles.	PSC, Dept of Lands, private residents	2	by end 2010	20000
Numerous foreshore buildings in this management zone are prone to wave runup.			143	Establish vegetative ground cover in front of existing low seawalls. Improve understanding of risks associated with climate change and sea level rise and develop appropriate policy responses to provide clear direction to residents and land managers (see Action 19a).	PSC, private residents, DECC	3	by end 2010	1000
As above.			144	Implement recommendations in Port Stephens Foreshore (Floodplain) Management Plan.	PSC	2	by end 2010	NA
Vehicle access and the illegal launching of boats in Mambo Wetland may be contributing to foreshore erosion.			145	Implement recommendations made in Mambo Wetland Plan of Management.	PSC	1	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity								
The visual amenity of this management zone is threatened by visually obtrusive public amenity blocks, signage, stormwater outlets, urban development and foreshore structures.			146	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline. Give effect to sustainability principles in determining development applications	PSC, Dept Planning	2	Immediate and ongoing	NA
As above.			147	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.5 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	PSC Dept Planning	1	by end 2017	NA
As above.			148	Investigate methods of screening stormwater outlets and/or installing alternatives such as artificial wetlands. See Section 7.2.4 .	PSC, CMA, MPA	3	by end 2010	5000
As above.			149	Undertake a review of signage along the foreshore with a view to reducing the overall number of signs standardising their design and locating them in more appropriate locations. See Section 7.2.7 .	PSC GLC NSW Maritime MPA DECC Dept Lands	2	by end 2012	80000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity (cont)								
The Salamander Bay Boat Ramp is difficult to use in some conditions and there is limited manoeuvring area.	A3_19	Salamander Bay Boat Ramp.	150	Investigate upgrading ramp to make a more user friendly local scale boat ramp. Also consider installing a pontoon adjacent to the existing wharf to assist in loading/unloading passengers.	PSC, NSW Maritime	1	by end 2010	40000
The waterway access facilities (including reserves accessible to boat based people) in this management zone have the potential to be utilised more intensively.			151	Disseminate information about the range of waterway access facilities available through Council and community newsletters advertising in the local media tourist information and signage.	PSC, NSW Maritime	1	by end 2010	20000
There is an under supply of dinghy racks in the management zone and existing dinghy racks have inadequate capacity.	A3_21	Dinghy racks (Roy Wood Reserve (2) Kangaroo Point Reserve (1)).	152	Install new dinghy racks at Roy Wood Reserve (3) southern end of Wanda Beach and George Reserve.	PSC	2	by end 2012	10000

12.7 Cromartys Bay (Management Zone B1)

12.7.1 Summary

The main management issues identified in this Management Zone are:

- the Soldiers Point area is highly significant to the local Aboriginal community;
- Mud Point, the foreshore of Cromartys Bay and Dowered Island support important mangrove and saltmarsh habitat. The vegetation in Stony Ridge Reserve is significant and contains preferred and supplementary koala habitat;
- Pearsons Park and Taylors Beach Reserve have the potential to be more intensively utilised (including by boat based visitors);
- the waterway access facilities (Soldiers Point Boat Ramp and Taylors Beach Boat Ramp) require upgrades to encourage increased usage; and
- many existing rock revetments and seawalls do not have approval and have not been built in accordance with standard coastal engineering principles.

The Soldiers Point area contains important Aboriginal heritage sites that are of great concern to the local Aboriginal community. The Soldiers Point Management Plan sets out management priorities for the tip of the peninsula, however all planning and development in the area should consider potential impacts to Aboriginal heritage in consultation with relevant Aboriginal community groups.

The Port Stephens Wetland Management report provides recommendations regarding the importance, management and conservation of the mangrove/saltmarsh habitats in the area. An identified management option with regard to the Stony Ridge Reserve is to develop a management plan which addresses both the conservation and appropriate use of the area.

This Management Zone also has the capacity for the more intensive usage of both the waterway access facilities and public reserves. An upgrade to the recreational facilities at Pearsons Park and Taylors Beach Reserve, as well as an upgrade to both Soldiers Point Boat Ramp (to a regional facility) and Taylors Beach Boat Ramp (to a more user friendly local facility) may encourage people away from the overcrowded areas of the outer port. The extension of the cycleway system along this section of the foreshore would also increase its public accessibility.

Similar to Management Zones A2 and A3, a number of existing rock revetments at the northern tip of Soldiers Point, Sunset Beach, and Taylors Beach have not been built in accordance with standard coastal engineering principles. The feasibility of reconstructing these could be investigated.

12.7.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Aboriginal Heritage								
The Soldiers Point area is highly significant to the local Aboriginal community.	B1_21	Aboriginal heritage.	153	Implement guidelines and recommendations in Soldiers Point Management Plan.	PSC, local Aboriginal community, DECC	1	by end 2010	NA
Ecological Habitat								
Dowered Island supports important mangrove and mangrove/saltmarsh habitat. The island has been mapped as SEPP14 wetland.	B1_3	Estuarine vegetation on Dowered Island.	154	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	B1_3	As above.	155	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
Mud Point and the foreshore of Cromartys Bay support important mangrove and saltmarsh/mangrove habitat. The entire area has been mapped as SEPP14 wetland. The area is also an important shorebird roosting habitat and contains areas of preferred and supplementary koala habitat. A strip of Swamp Sclerophyll Forest on Coastal Floodplains EEC occurs along the eastern foreshore of Cromartys Bay.	B1_2	Estuarine vegetation on Mud Point and foreshore of Cromartys Bay.	156	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
As above.	B1_2	As above.	157	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
As above.	B1_2	Estuarine vegetation on Mud Point and foreshore of Cromartys Bay.	158	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
The riparian vegetation in Stony Ridge Reserve is significant remnant vegetation and contains preferred and supplementary koala habitat.	B1_1	Riparian vegetation in Stony Ridge Reserve.	159	Continue to support community groups undertaking bushland rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	varying
As above.	B1_1	As above.	160	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
As above.	B1_1	As above.	161	Prepare management plan for the use and conservation of Stony Ridge reserve.	PSC	2	by end 2012	20000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
Pathways/cycleways could be constructed to allow access along the majority of foreshore in this management zone.			162	Construct pathway/cycleway along foreshore reserve from Pearsons Park to Diemar Point.	PSC	2	by end 2017	100000
Pearsons Park and Taylors Beach Reserve have the potential to be more intensively utilised (particularly by boat based visitors).			163	Disseminate information about the range of foreshore reserves along the shoreline through Council and community newsletters advertising in the local media and through the production of appropriate tourist information and signage.	PSC	1	by end 2010	20000
Public access is discouraged by the private appearance of the public foreshore reserve at Sunset Beach.			164	Install signage to indicate that public access is welcome along foreshore.	PSC	3	by end 2012	1000
Taylors Beach Foreshore Reserve car park is below standard.	B1_13	Taylors Beach Foreshore Reserve car park	165	Formalise car park and rationalise car park space. Incorporate adequate parking for trailers.	PSC	2	by end 2012	40000
The facilities of Pearsons Park require improvement.	B1_7	Pearsons Park and facilities (public amenities, picnic tables, BBQ, children's playground).	166	Install more BBQs.	PSC	2	by end 2010	10000
As above.	B1_7	As above.	167	Upgrade public amenities. Design to be as visually unobtrusive as possible.	PSC	2	by end 2010	100000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
The landscaping and facilities of Soldiers Point Foreshore Reserve (including Everitt Park) require improvement.	B1_6	Soldiers Point Foreshore Reserve (including Everitt Park) and facilities (picnic tables).	168	Implement recommendations of Soldiers Point Boating Infrastructure and Foreshore Management Plan (in progress).	PSC NSW Maritime	1	pending	pending
The landscaping and facilities of Taylors Beach Foreshore Reserve require improvement.	B1_9	Taylors Beach Foreshore Reserve and facilities (public amenities, picnic tables, BBQs, children's playground).	169	Investigate feasibility of reconstructing foreshore structures in accordance with standard coastal engineering principles.	PSC	2	by end 2017	20000
As above.	B1_9	As above.	170	Upgrade public amenities in Taylors Beach Reserve. Design to be as visually unobtrusive as possible.	PSC	2	by end 2012	80000
Foreshore Stability								
Many existing seawalls and rock revetments are unauthorised and/or have not been built in accordance with standard coastal engineering principles (e.g. northern tip of Soldiers Point Sunset Beach Taylors Beach).			171	Investigate feasibility of reconstructing foreshore structures in accordance with standard coastal engineering principles.	PSC, Dept of Lands, MPA, private residents	2	by end 2012	20000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity								
The visual amenity of this management zone is threatened by visually obtrusive public amenity blocks, signage, stormwater outlets, urban development, foreshore erosion and structures.			172	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline. Give effect to sustainability principles when determining development applications.	PSC, Dept Planning	2	Immediate and ongoing	NA
As above.			173	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.6 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	PSC, Dept Planning	1	by end 2017	NA
As above.			174	Implement relevant recommendations in Soldiers Point Management Plan.	PSC	1	by end 2012	NA
As above.			175	Investigate methods of screening stormwater outlets and/or installing alternatives such as artificial wetlands. See Section 7.2.4 .	PSC, CMA, MPA	3	by end 2010	5000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity (cont)								
The visual amenity of this management zone is threatened by visually obtrusive public amenity blocks signage stormwater outlets, urban development, foreshore erosion and structures.			176	Undertake a review of signage along the foreshore with a view to reducing the overall number of signs standardising their design and locating them in more appropriate locations. See Section 7.2.7 .	PSC, GLC, NSW Maritime, MPA, DECC, Dept Lands	2	by end 2012	80000
Water Quality								
There is a high potential for acid sulphate soils in this management zone.			177	Continue to implement recommendations made in Strategic Guidelines for the Management of Acid Sulphate Soil in the Port Stephens and Anna Bay Catchments.	PSC	1	Immediate and ongoing	NA
Waterway Access and Facilities for Boat Users								
Regular environmental auditing of Soldiers Point Marina/slipway is currently not undertaken.	B1_19	Soldiers Point Marina and slipway.	178	Undertake environmental audit. A strict timetable to rectify non-compliance should be enforced if required.	PSC	1	by end 2010	5000
The Soldiers Point Boat Ramp requires an upgrade to increase level of usage and to improve its functionality.	B1_	Soldiers Point Boat Ramp.	179	Upgrade boat ramp and associated facilities as prescribed in Soldiers Point Boating Infrastructure and Foreshore Management Plan (in progress).	PSC, NSW Maritime, MPA	1	by end 2010	pending
The Taylors Beach Boat Ramp requires an upgrade to improve its functionality.	B1_15	Taylors Beach Boat Ramp.	180	Upgrade boat ramp to a more user friendly local/tourist facility.	PSC, NSW Maritime, MPA	1	by end 2012	50000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Waterway Access and Facilities for Boat Users (cont)								
The Taylors Beach Jetty requires maintenance.	B1_16	Taylors Beach Jetty.	181	Undertake minor structural maintenance and additional safety requirements as prescribed in Port Stephens Foreshore Facilities Assessment.	PSC, NSW Maritime	2	by end 2010	20000
The waterway access facilities (including reserves accessible by boat based users) in this management zone could be more intensively utilised.			182	Disseminate information about the range of waterway access facilities available through Council and community newsletters advertising in the local media tourist information and signage.	PSC, NSW Maritime	1	by end 2010	20000
There is an under supply of dinghy racks in the management zone and existing dinghy racks have inadequate capacity.	B1_17	Dinghy racks (Soldiers Point Boat Ramp area Sunset Beach (north end) Sunset Beach (south end)).	183	Install new dinghy racks at Sunset Beach (north end) Sunset Beach (south end) and Taylors Beach Reserve.	PSC	3	by end 2012	6000
There is currently no jetty at Soldiers Point.			184	Construct a jetty adjacent to Soldiers Point Boat Ramp as prescribed in the Soldiers Point Boating Infrastructure and Foreshore Management Plan.	PSC, NSW Maritime, MPA	1	by end 2010	pending

12.8 Tilligerry Creek (Management Zone B2)

12.8.1 Summary

The main management issues identified in this Management Zone are:

- the northern and southern foreshore of Tilligerry Creek, Wallis Creek, Fenninghams Island Creek and Bobs Farm Creek support important saltmarsh and mangrove habitat. Remnants of three Ecologically Endangered Communities are also located within this zone, along with remnants of preferred koala habitat;
- mangroves appear to have been removed in front of residential areas in the lower Tilligerry Creek area;
- many existing seawalls and rock revetments along Lower Tilligerry Creek are unauthorised and/or have not been built in accordance with sound coastal engineering principles;
- Lilli Pilli Boat Ramp requires an upgrade to improve its functionality; and
- the Tilligerry Creek foreshore may be a potential location for a new boat ramp.

A large proportion of the foreshore in this management zone is characterised by mangrove and saltmarsh communities which have been mapped as SEPP 14 wetlands. These form an important component of the Port Stephens estuary. The Tilligerry Creek Catchment Management Plan details recommendations regarding the protection of this vegetation, and also addresses the issues of water quality, acid sulphate soils and foreshore erosion (see below).

Erosion along the northern bank of the lower Tilligerry Creek is probably caused by a combination of the removal of mangroves and resultant wind wave activity, as well as a more long term process affecting the full depth of the Tilligerry Creek channel. The majority of the existing foreshore protection structures along this section of foreshore have not been constructed in accordance with sound engineering practices and pose a threat to public safety in some instances. Many are also visually obtrusive and inhibit access to the intertidal zone. The majority of existing foreshore protection structures, as well as a number of private ramps and access ways, are constructed illegally on public reserve.

The Tilligerry Creek Catchment Management Plan recommends the re-establishment of mangroves, the removal of existing foreshore protection structures, and a local community education campaign to provide information about the importance of mangroves and appropriate bank stabilisation methods.

The Lilli Pilli Boat Ramp is a local scale boat ramp which could be upgraded to improve its functionality, and possibly reduce the pressure on other boat ramps in the area. The associated car park requires an upgrade, as does the Mungarra Reserve car park. The Tilligerry Creek foreshore may contain an appropriate location for a new boat ramp, however the feasibility of this would need to be investigated further.

12.8.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
Mangroves appear to have been removed in front of residential areas in the lower Tilligerry Creek area.			185	Implement recommendations made in Tilligerry Creek Catchment Management Plan, including implementation of a community education program that informs people about the important ecological and foreshore stability values provided by mangroves/saltmarsh. Provide information about relevant legislation and potential penalties for removal.	PSC	1	by end 2010	10000
The northern and southern foreshore of Tilligerry Creek (and Wallis Creek, Fenninghams Island Creek and Bobs Farm Creek) supports important mangrove and saltmarsh habitat. The area has been mapped as SEPP14 wetlands. Remnants of Swamp Oak Floodplain Forest EEC, Coastal Saltmarsh EEC and Swamp Sclerophyll Forest on Coastal Floodplains EEC occur here. The foreshore also supports remnants of preferred koala habitat.	B2_1	Estuarine vegetation on foreshores of Tilligerry Creek, Wallis Creek, Fenninghams Island Creek and Bobs Farm Creek.	186	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
As above.	B2_1	As above.	187	Implement relevant management recommendations made in Comprehensive Koala Plan of Management.	PSC	2	by end 2010	NA
As above.	B2_1	As above.	188	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
Foreshore Reserves and Facilities								
Lilli Pilli Boat Ramp car park is below standard.	B2_7	Lilli Pilli Car Park.	189	Formalise car park.	PSC	3	by end 2012	40000
Mungarra Reserve car park is below standard.	B2_8	Mungarra Reserve car park.	190	Formalise car park and rationalise car park space.	PSC	3	by end 2017	30000
The existing pathway could be sealed/formalised to allow easier access.	B2_6	Tilligerry Creek Koala Walk (between Koala Shores Holiday Park and Koala Park).	191	Formalise pathway between Koala Shores Holiday Park and Koala Park (Tilligerry Creek Koala Walk).	PSC	4	by end 2017	80000
Foreshore Stability								
Many existing seawalls and rock revetments along Lower Tilligerry Creek are unauthorised and/or have not been built in accordance with sound coastal engineering principles.			192	Investigate feasibility of reconstructing seawalls and rock revetment in accordance with sound coastal engineering principles.	PSC, Dept of Lands, private residents, MPA	2	by end 2012	20000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity								
The visual amenity of this management zone is threatened by stormwater outlets, urban development and foreshore structures			193	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline. Give effect to sustainability principles when determining development applications.	PSC, Dept Planning	2	Immediate and ongoing	NA
As above.			194	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.6 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	PSC, Dept Planning, Dept of Lands	1	by end 2017	NA
As above.			195	Investigate methods of screening stormwater outlets and/or installing alternatives such as artificial wetlands. See Section 7.2.4 .	PSC, CMA, MPA	3	by end 2010	5000
Water Quality								
The Tilligerry Creek area has a high potential for acid sulphate soils.			196	Continue to implement recommendations made in Strategic Guidelines for the Management of Acid Sulphate Soil in the Port Stephens and Anna Bay Catchments.	PSC	1	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Water Quality (cont)								
The water quality of Tilligerry Creek has been affected by faecal contamination from septic tanks.			197	Continue to upgrade and monitor on-site septic systems in the Tilligerry Creek catchment.	PSC	1	Immediate and ongoing	NA
Tilligerry Creek water quality is affected by rural runoff.			198	Implement recommendations made in Tilligerry Creek Catchment Management Plan in relation to water quality.	PSC	1	by end 2017	NA
Waterway Access and Facilities for Boat Users								
The Lilli Pilli Boat Ramp requires an upgrade to improve its functionality.	B2_9	Lilli Pilli Boat Ramp.	199	Upgrade boat ramp to a more user friendly local scale facility.	PSC	1	by end 2012	40000
The Tilligerry Creek foreshore may be an appropriate location for a new boat ramp.			200	Investigate the feasibility of locating a boat ramp on the Tilligerry Creek foreshore.	PSC	1	by end 2012	5000
There is an under supply of dinghy racks in the management zone and existing dinghy racks have inadequate capacity.	B2_10	Dinghy rack at Lilli Pilli Boat Ramp.	201	Install dinghy racks at end of Crawley Avenue at end of Blanch Street and at the Lilli Pilli Boat Ramp.	PSC	2	by end 2017	6000

12.9 Lemon Tree Passage (Management Zone B3)

12.9.1 Summary

The main management issues identified in this Management Zone are:

- Bulls Island and the eastern foreshore of Lemon Tree Passage support saltmarsh and mangrove habitats that are mapped as SEPP 14 wetlands. An Ecologically Endangered Community and a remnant patch of supplementary koala habitat are also located in this area. Bulls Island is also an important roosting habitat for shorebirds;
- the facilities and landscaping of a number of foreshore reserves could be improved and more intensively used, including by boat based visitors;
- the Lemon Tree Passage Boat Ramp, Jetty and swimming enclosure require upgrades; and
- the existing seawalls and rock revetments are unauthorised and/or have not been built in accordance with sound coastal engineering principles.

A large part of the foreshore in this Management Zone consists of public reserve and this has the potential to be used more intensively and possibly decrease the pressure on other reserves in the Outer Port. Additional facilities in areas such as Nerang Reserve and Lilli Pilli Reserve may encourage more picnickers and sightseers to the area. Additionally, the Lemon Tree Passage Boat Ramp, Jetty and swimming enclosure require upgrades to a standard suitable for regional scale facilities. This may also encourage more boat users and visitors to use these inner port facilities and so reduce pressure on other overcrowded waterway access facilities.

Similar to other foreshore areas on the Tilligerry Peninsula there are a number of seawalls in this Management Zone that are unauthorised and have not been built appropriately. The feasibility of replacing these structures in accordance with standard coastal engineering principles will need to be investigated on a port-wide basis.

12.9.2 Identified Management Action

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
Bulls Island supports important relatively undisturbed saltmarsh habitat. The island is mapped as SEPP14 wetland as well as the Coastal Saltmarsh EEC. The whole island is important roosting habitat for shorebirds.	B3_1	Estuarine vegetation on Bulls Island.	202	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	B3_1	As above.	203	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
The eastern foreshore of Lemon Tree Passage supports important mangrove habitat. This is mapped as SEPP14 wetland. A remnant patch of supplementary koala habitat is located here.	B3_2	Estuarine vegetation on eastern foreshore of Lemon Tree Passage.	204	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	B3_2	As above.	205	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
As above.	B3_2	As above.	206	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
Foreshore Reserves and Facilities								
Nerang Reserve requires more facilities for picnickers.	B3_5	Nerang Reserve and facilities (picnic tables).	207	Install BBQs and picnic tables.	PSC	3	by end 2012	6000
The facilities and landscape of Henderson Park require improvement.	B3_7	Henderson Park and facilities (public amenities, picnic tables, BBQs, tap, cold shower, children's playground).	208	Improve general landscaping.	PSC	3	by end 2010	5000
As above.	B3_7	As above.	209	Upgrade existing public amenities. Design facilities to be as visually unobtrusive as possible.	PSC	2	by end 2017	80000
The foreshore parks and reserves in this management zone have the potential to be more intensively utilised (including by boat based users).			210	Disseminate information about the range of foreshore reserves along the shoreline through Council and community newsletters advertising in the local media and through the production of appropriate tourist information and signage.	PSC	1	by end 2010	20000
The landscaping and facilities of Lilli Pilli Reserve require improvement.	B3_10	Lilli Pilli Reserve.	211	Install BBQs and picnic tables.	PSC	2	by end 2012	5000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
As above.	B3_10	As above.	212	Install public amenities. Design and locate to be as visually unobtrusive as possible. Develop and implement design guidelines for foreshore structures (structural and visual issues)	PSC	2	by end 2017	200000
Foreshore Stability								
The existing seawalls and rock revetments have not been built in accordance with sound coastal engineering principles.			213	Investigate feasibility of reconstructing foreshore structures in accordance with standard coastal engineering principles.	PSC Dept of Lands	2	by end 2012	10000
Visual Amenity								
The visual amenity of this management zone is threatened by visually obtrusive public amenity blocks, signage, stormwater outlets and urban development.			214	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline. Give effect to sustainability principles in determining development applications	PSC, Dept Planning	2	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity (cont)								
As above.			215	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.6 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	PSC Dept Planning	1	by end 2017	NA
As above.			216	Investigate methods of screening stormwater outlets and/or installing alternatives such as artificial wetlands. See Section 7.2.4 .	PSC, CMA, MPA	3	by end 2010	5000
As above.			217	Undertake a review of signage along the foreshore with a view to reducing the overall number of signs standardising their design and locating them in more appropriate locations. See Section 7.2.7 .	PSC GLC NSW Maritime MPA DECC Dept Lands	2	by end 2012	80000
Water Quality								
On-site septic systems are a potential threat to water quality.			218	Continue to implement program of upgrading and monitoring of on-site septic systems.	PSC	1	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Water Quality (cont)								
There is a high potential for acid sulphate soils in this management zone.			219	Continue to implement recommendations made in Strategic Guidelines for the Management of Acid Sulphate Soil in the Port Stephens and Anna Bay Catchments.	PSC	1	Immediate and ongoing	NA
Waterway Access and Facilities								
Regular audits of Lemon Tree Passage Marina and slipway are currently not undertaken.	B3_15	Lemon Tree Passage Marina.	220	Undertake environmental audit. A strict timetable to rectify non-compliance should be enforced.	PSC	1	by end 2010	5000
The Lemon Tree Passage Boat Ramp requires an upgrade to increase its level of usage.	B3_11	Lemon Tree Passage Boat Ramp.	221	Upgrade Lemon Tree Passage Boat Ramp to a regional scale facility.	PSC	1	by end 2012	80000
The Lemon Tree Passage Jetty requires an upgrade to increase its level of usage.	B3_12	Lemon Tree Passage Jetty.	222	Upgrade jetty to level consistent with a regional scale facility.	PSC	1	by end 2012	80000
The Lemon Tree Passage swimming enclosure requires an upgrade to increase its level of usage.	B3_13	Lemon Tree Passage Swimming Enclosure.	223	Upgrade swimming enclosure to complement regional scale boat ramp facility.	PSC	1	by end 2012	50000
The waterway access facilities in this management zone could be more intensively utilised.			224	Disseminate information about the range of waterway access facilities available through Council and community newsletters advertising in the local media tourist information and signage.	PSC, NSW Maritime	1	by end 2010	20000

12.10 Mallabula and Tanilba Bay (Management Zone C1)

12.10.1 Summary

The main management issues identified in this Management Zone are:

- there are areas of significant riparian vegetation within Mallabula and Rookes Point Reserves, including a remnant patch of Ecologically Endangered Community;
- the Tilligerry Habitat is a significant freshwater wetland that contains preferred koala habitat;
- many of the existing seawalls and rock revetments have not been built in accordance with sound coastal engineering principles;
- the facilities and landscaping of a number of foreshore reserves could be improved and more intensively used, including by boat based visitors; and
- Tanilba Bay is being affected by foreshore erosion.

Mallabula and Rookes Point Reserves have important conservation and recreational values. A plan of management is required to ensure that these values are maintained and enhanced for the long term. There is great community concern regarding the Tilligerry Habitat and the community is actively involved in its care and management. The adjacent area is currently classified as an off-leash dog exercise area, however this is considered incompatible with its conservation values, particularly the fact that there is a large koala population in the area.

The Tilligerry Habitat area, along with the majority of Tanilba Bay is suffering from long term erosion. WP Geomarine undertook the Tanilba Bay Erosion Management Study in 1997. The study found that net littoral flow in the bay is west to east, and that three out of four seasons are characterised by predominantly westerly and north-westerly winds. Additionally, the littoral processes at the western and eastern ends are strongly influenced by waves diffracted around Rookes Point and Sunrise Point Headlands. Local processes were also found to be affecting specific sections of the bay. For example, the boat ramp in Caswell Reserve is obstructing the predominant littoral flow, resulting in local erosion to the east of the boat ramp. A number of management recommendations were made and Council is continuing to implement these, including the removal of the Caswell Reserve boat ramp in the near future.

The feasibility of rebuilding the existing seawalls and rock revetments in the area, and putting in place structures that properly deal with the ongoing erosion in this Management Zone should also be considered.

The majority of the foreshore in this area consists of public reserve that has the potential to be landscaped and improved and so utilised more intensively. Greater use of this area could contribute to decreasing the pressure on other overcrowded reserves in the Outer Port.

12.10.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
The riparian vegetation in Mallabula/Rookes Point Reserves is significant remnant vegetation. A remnant stand of Swamp Sclerophyll Forest on Coastal Floodplains EEC occurs here. Remnants of preferred koala habitat also occur here.	C1_1	Riparian vegetation in Mallabula/Rookes Point Reserve.	225	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
As above.	C1_1	As above.	226	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	C1_1	As above.	227	Continue to support community groups undertaking rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	varying
As above.	C1_1	Riparian vegetation in Mallabula/Rookes Point Reserve.	228	Prepare and implement a plan for the conservation and management of the Mallabula/Rookes Point Reserves.	PSC	2	by end 2017	20000
The Tilligerry Habitat is a significant freshwater wetland. The area contains preferred koala habitat.	C1_2	Tilligerry Habitat vegetation.	229	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
As above.	C1_2	As above.	230	Implement relevant management recommendations made in Comprehensive Koala Plan of Management. For example, expand the information provided on Section 149 certificates to reflect the presence of koala habitat.	PSC	2	by end 2010	NA
As above.	C1_2	Tilligerry Habitat vegetation.	231	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
Foreshore Reserves and Facilities								
A pathway/cycleway along the entire foreshore of this management zone would improve public access and amenity.	C1_6	Tilligerry Habitat boardwalk.	232	Construct pathway/cycleway along the foreshore between Henderson Park and Rudd Reserve.	PSC	1	by end 2017	60000
As above.	C1_6	As above.	233	Investigate the feasibility of a pathway/cycleway extending between Rudd Reserve and Caswell Reserve.	PSC	2	by end 2010	1000
As above.	C1_6	As above.	234	Extend pathway/boardwalk from Caswell Reserve to Swan Park.	PSC	2	by end 2017	100000
Car parking at Kooindah Park requires upgrading to support more intensive usage.			235	Plan and improve car parking at Kooindah Park.	PSC	2	by end 2012	30000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
Public access is discouraged by the private appearance of the public foreshore reserve at Sunrise Point.			236	Install signage to indicate that public access is welcome along foreshore.	PSC	2	by end 2010	500
The Caswell Reserve car park is below standard.	C1_11	Caswell Reserve car park.	237	Formalise car park and rationalise car park space.	PSC	3	by end 2012	40000
The foreshore parks and reserves in this management zone have the potential to be more intensively utilised (including by boat based users).			238	Disseminate information about the range of foreshore reserves along the shoreline through Council and community newsletters advertising in the local media and through the production of appropriate tourist information and signage.	PSC	1	by end 2010	20000
The Foster Park car park is below standard.	C1_16	Foster Park car park.	239	Formalise car park and rationalise car park space.	PSC	3	by end 2012	40000
The landscape and facilities of Caswell Reserve require improvement.	C1_10	Caswell Reserve and facilities (public amenities, picnic tables, BBQs, cold showers).	240	Upgrade public amenities. Design to be as visually unobtrusive as possible.	PSC	3	by end 2012	80000
As above.	C1_10	As above.	241	Upgrade picnic tables and BBQs.	PSC	2	by end 2012	3000
As above.	C1_10	As above.	242	Improve landscaping of reserve in general include plantings.	PSC	2	by end 2010	5000
The landscape and facilities of Foster Park require improvement.	C1_15	Foster Park and facilities (picnic tables, BBQs, children's playground).	243	Improve general landscaping through plantings.	PSC	3	by end 2010	1000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
As above.	C1_15	As above.	244	Install public amenities. Design and locate to be as visually unobtrusive as possible.	PSC	2	by end 2012	180000
The landscape and facilities of Kooindah Park require improvement.	C1_5	Kooindah Park and facilities (picnic tables).	245	Improve the landscaping of the entire park include substantial plantings.	PSC	1	by end 2010	5000
As above.	C1_5	As above.	246	Install BBQs and picnic tables.	PSC	1	by end 2010	6000
As above.	C1_5	Kooindah Park and facilities (picnic tables).	247	Upgrade footbridge over creek at Kooindah Park.	PSC	1	by end 2010	10000
The landscape and facilities of Peace Park require improvement.	C1_13	Peace Park and facilities (public amenities, picnic tables, BBQs, children's playground)	248	Upgrade public amenities. Design to be as visually unobtrusive as possible.	PSC	3	by end 2012	80000
As above.	C1_13	As above.	249	Improve general landscaping include plantings.	PSC	3	by end 2010	5000
As above.	C1_13	As above.	250	Install picnic tables and BBQs.	PSC	2	by end 2010	4000
The landscape of Swan Park could be improved.	C1_18	Swan Park.	251	Improve landscaping through plantings.	PSC	3	by end 2010	1000
The off-leash dog exercise area adjacent to the Tilligerry Habitat is not appropriate in this preferred koala habitat area.			252	Continue to monitor dog off leash areas and undertake community education on responsible pet ownership.	PSC	1	by end 2010	2000
The Peace Park car park is below standard.	C1_14	Peace Park car park.	253	Formalise car park and rationalise car park space.	PSC	2	by end 2012	20000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
The Rookes Point Reserve car park is below standard.	C1_12	Rookes Point Reserve car park.	254	Formalise car park and rationalise car park space.	PSC	2	by end 2017	40000
As above.	C1_12	As above.	255	Upgrade unsealed access road to Rookes Point car park.	PSC	2	by end 2017	20000
Foreshore Stability								
Many of the existing seawalls and rock revetments have not been built in accordance with sound coastal engineering principles. Examples include the Council built rock revetment along Peace Park and private structures at Sunrise Point.			256	Investigate feasibility of reconstructing seawalls and rock revetment in accordance with sound coastal engineering principles.	PSC, Dept of Lands	2	by end 2012	1000000
As above.			257	Implement management recommendations in Tanilba Bay Erosion Management Study.	PSC, Dept of Lands, private residents	2	by end 2012	NA
Visual Amenity								
The visual amenity of this management zone is threatened by visually obtrusive public amenity blocks, signage, stormwater outlets, urban development, foreshore erosion and foreshore structures.			258	Investigate methods of screening stormwater outlets and/or installing alternatives such as artificial wetlands. See Section 7.2.4 .	PSC, CMA, MPA	3	by end 2010	5000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity (cont)								
As above.			259	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline.	PSC, Dept Planning	2	Immediate and ongoing	NA
As above.			260	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.6 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	PSC, Dept Planning	1	by end 2017	NA
As above.			261	Undertake a review of signage along the foreshore with a view to reducing the overall number of signs standardising their design and locating them in more appropriate locations. See Section 7.2.7 .	PSC, GLC, NSW Maritime, MPA, DECC, Dept Lands	2	by end 2012	80000
Water Quality								
There is a high potential for acid sulphate soils in this management zone.			262	Continue to implement recommendations made in Strategic Guidelines for the Management of Acid Sulphate Soil in the Port Stephens and Anna Bay Catchments.	PSC	1	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Waterway Access and Facilities for Boat Users								
The existing dinghy racks have inadequate capacity.	C1_23	Dinghy racks (Peace Park Foster Park).	263	Install dinghy rack with greater capacity at Foster Park.	PSC	3	by end 2017	2000
The Foster Park Boat Ramp requires an upgrade to improve its functionality and increase its usage.	C1_21	Foster Park Boat Ramp.	264	Upgrade boat ramp to a more user friendly local/tourist facility.	PSC, NSW Maritime	1	by end 2012	40000
The Rookes Point Jetty requires maintenance.	C1_22	Rookes Point Jetty.	265	Upgrade Rookes Point Jetty.	PSC	2	by end 2017	30000
The waterway access facilities (including reserves accessible to boat based people) in this management zone could be more intensively utilised.			266	Disseminate information about the range of waterway access facilities available through Council and community newsletters advertising in the local media tourist information and signage.	PSC, NSW Maritime	1	by end 2010	20000
There are a number of boat ramps in this management zone which are in sub standard condition and may be contributing to foreshore stability issues.			267	Remove Caswell Reserve Boat Ramp and boat ramps in the Peace Park area.	PSC, MPA	1	by end 2010	40000

12.11 Big Swan Bay, Twelve Mile Creek, Little Swan Bay and Reedy Creek (Management Zone C2)

12.11.1 Summary

The main management issue identified in this Management Zone is the large areas of important estuarine vegetation in the Twelve Mile Creek, Little Swan Bay and Reedy Creek areas that have been mapped as SEPP 14 wetland and contain preferred koala habitat. There are also remnant stands of two Ecologically Endangered Communities. This Management Zone is relatively undeveloped and should be managed in a way that protects its natural values for the long term.

12.11.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
Little Swan Bay supports important estuarine vegetation. SEPP14 wetland is mapped around large areas of the foreshore.	C2_5	Estuarine vegetation around the foreshore of Little Swan Bay.	268	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	C2_5	As above.	269	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
Reedy Creek supports important estuarine vegetation. The area is mapped as SEPP14 wetland. An area of preferred koala habitat occurs to the north of the creek.	C2_6	Reedy Creek estuarine vegetation.	270	Encourage private landowners to enter into conservation agreements to protect foreshore vegetation.	DECC	3	by end 2012	NA
As above.	C2_6	As above.	271	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	C2_6	As above.	272	Implement relevant management recommendations made in Comprehensive Koala Plan of Management.	PSC	2	by end 2010	NA
As above.	C2_6	As above.	273	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
The foreshore of Big Swan Bay supports important estuarine vegetation. SEPP14 wetland is mapped around the foreshore. The area contains remnants of Swamp Sclerophyll Forest on Coastal Floodplains EEC and preferred koala habitat.	C2_1	Big Swan Bay estuarine vegetation.	274	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	C2_1	As above.	275	Implement relevant management recommendations made in Comprehensive Koala Plan of Management.	PSC	2	by end 2010	NA
As above.	C2_1	As above.	276	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
Twelve Mile Creek supports important estuarine vegetation. The area has been mapped as SEPP14 wetland and contains preferred koala habitat. Remnants of Coastal Saltmarsh EEC and Swamp Sclerophyll Forest on Coastal Floodplains EEC also occur.	C2_3	Twelve Mile Creek estuarine vegetation.	277	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat (cont)								
As above.	C2_3	As above.	278	Implement management recommendations in draft Twelve Mile Creek Catchment Management Plan.	Dept Defence	2	Immediate and ongoing	NA
As above.	C2_3	As above.	279	Implement relevant management recommendations made in Comprehensive Koala Plan of Management.	PSC	2	by end 2010	NA
As above.	C2_3	As above.	280	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
Foreshore Reserves and Facilities								
The landscape and facilities of Sunset Park require improvement.	C2_7	Sunset Park and facilities (picnic tables and BBQs).	281	Improve landscaping through plantings.	PSC	2	by end 2010	1000
As above.	C2_7	As above.	282	Install public amenities. Design and locate to be as visually unobtrusive as possible.	PSC	2	by end 2017	200000
Foreshore Stability								
Many existing seawalls and rock revetments are unauthorised and/or have generally not been built in accordance with sound coastal engineering principles. For example, private structures at Swan Bay.			283	Investigate feasibility of reconstructing seawalls and rock revetment in accordance with sound coastal engineering principles.	PSC, Dept of Lands, MPA	2	by end 2012	10000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity								
The visual amenity of this management zone is threatened by urban development and foreshore structures.			284	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline.	PSC, Dept Planning	2	Immediate and ongoing	NA
As above.			285	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.6 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	PSC Dept Planning	1	by end 2017	NA
Water Quality								
Sections of this management zone are affected by rural runoff.			286	Implement recommendations made in Twelve Mile Creek Catchment Management Plan.	Dept Defence	1	Immediate and ongoing	NA
As above.			287	Implement recommendations made in Urban Stormwater and Rural Water Quality Management Plan (Port Stephens LGA).	PSC, CMA, MPA	1	by end 2010	NA
The activities of the Williamstown RAAF have the potential to affect water quality.			288	Ensure that fuel and stormwater management systems at RAAF base are in place and effective.	Dept Defence	1	Immediate and ongoing	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Water Quality (cont)								
There is a high potential for acid sulphate soils in this management zone.			289	Continue to implement recommendations made in Strategic Guidelines for the Management of Acid Sulphate Soil in the Port Stephens and Anna Bay Catchments.	PSC	1	Immediate and ongoing	NA
Waterway Access and Facilities for Boat Users								
Oyster Cove may be an appropriate location for a new boat ramp.			290	Investigate the feasibility of locating a new boat ramp at Oyster Cove.	PSC	1	by end 2010	5000
Regular audits of Oyster Cove Marina and slipway are currently not undertaken.	C2_8	Oyster Cove Marina.	291	Undertake environmental audit. A strict timetable to rectify non-compliance should be enforced.	PSC	1	by end 2012	5000

12.12 Lower Karuah River (Management Zone C3)

12.12.1 Summary

The main management issues identified in this Management Zone are:

- Snapper, Swan and Wirrung Islands, as well as the foreshore of the lower Karuah River support important estuarine vegetation that has been mapped as SEPP 14 wetland. Remnants of two Ecologically Endangered Communities also occur;
- the facilities and landscaping of Longworth Park, Karuah could be improved; and
- the Karuah Motor Yacht Club requires a more adequate site in terms of size and function.

This Management Zone is also relatively undeveloped and so retains large areas of estuarine habitat. The township of Karuah has the potential to become a more intensively used tourist destination and residential area. The foreshore reserves require an upgrade to encourage the enjoyment of this area. A new Karuah Motor Yacht Club on the western bank of the Karuah River and downstream of the Karuah Bridge would also make a positive social and economic contribution to the area.

12.12.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
Snapper Island supports important riparian vegetation.	C3_1	Snapper Island vegetation.	292	Continue to support community groups undertaking bushland rehabilitation and enhancement projects.	PSC	1	Immediate and ongoing	varying
Swan and Wurrung Islands support important estuarine vegetation. SEPP14 wetland is mapped across both islands as is the Coastal Saltmarsh EEC.	C3_2	Estuarine vegetation on Swan and Wurrung Islands.	293	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs,	PSC	1	Immediate and ongoing	NA
As above.	C3_2	As above.	294	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
The foreshore of the lower Karuah River supports important estuarine vegetation that has been mapped as SEPP14 wetland. Remnants of the Coastal Saltmarsh EEC and Swamp Oak Floodplain Forest EEC have also been mapped along the Karuah foreshore.	C3_3	Lower Karuah River estuarine vegetation.	295	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	C3_3	As above.	296	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities								
The facilities and landscape of Longworth Park require improvement.	C3_6	Longworth Park and facilities (public amenities, picnic tables, BBQs, children's playground).	297	Improve general landscaping. Include plantings.	PSC	1	by end 2010	5000
As above.	C3_6	As above.	298	Upgrade public amenities. Design to be as visually unobtrusive as possible.	PSC	1	by end 2012	80000
The Longworth Park car park is below standard.	C3_7	Longworth Park car park.	299	Formalise car park and rationalise car park space.	PSC	1	by end 2012	30000
Visual Amenity								
Oyster farm debris detracts from the visual amenity of the area.			300	Investigate means to clean up oyster farm debris.	DPI	3	by end 2012	10000
Waterway Access and Facilities for Boat Users								
The Karuah Motor Yacht Club requires a more adequate site.	C3_9	Karuah Motor Yacht Club.	301	Take action in relation to the Club's submission regarding tender to lease site on western bank of river downstream of the Karuah Bridge.	Dept Lands	1	by end 2010	NA

12.13 Karuah River Upstream of Karuah Bridge (Management Zone D)

12.13.1 Summary

The main management issues identified in this Management Zone are:

- the foreshore of the Karuah River supports important estuarine vegetation and the majority of it is mapped SEPP 14. Two Ecological Endangered Communities have been mapped along some sections;
- the facilities and landscaping of Memorial Park could be improved;
- the Karuah Boat Ramp and Jetty require an upgrade to a regional scale facility; and
- many of the foreshore rock revetments have not been built in accordance with sound coastal engineering principles.

As discussed in **Section 12.11.1**, the township of Karuah has the potential to become a popular tourist destination and residential area. Improved facilities within foreshore reserves and state-of-the-art water access facilities are likely to attract people to this easily accessible location which, in turn, provides easy access to Port Stephens. Upgrades to these reserves and facilities could also involve the reconstruction or improvement of the existing foreshore stabilisation structures. The riparian vegetation that characterises the Karuah River should continue to be managed for the long term conservation of its natural values.

12.13.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
The foreshore of the Karuah River supports important estuarine vegetation and the majority of it is mapped SEPP14. The EECs Coastal Saltmarsh Swamp Oak Floodplain Forest and Swamp Sclerophyll Forest on Coastal Floodplain have been mapped along some sections. Preferred koala habitat has been mapped on Horse Island.	D_1	Karuah River estuarine vegetation.	302	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	PSC	1	Immediate and ongoing	NA
As above.	D_1	As above.	303	Implement relevant management recommendations made in Comprehensive Koala Plan of Management.	PSC	2	by end 2010	NA
As above.	D_1	As above.	304	Implement relevant recommendations made in Port Stephens Wetland Management Report.	PSC	3	by end 2012	NA
Foreshore Reserves and Facilities								
The landscape and facilities of Memorial Park require improvement.	D_3	Memorial Park and facilities (public amenities, picnic tables, BBQs, children's playground).	305	Improve general landscaping. Include plantings.	PSC	2	by end 2010	5000
As above.	D_3	As above.	306	Upgrade public amenities. Design to be as visually unobtrusive as possible.	PSC	2	by end 2010	80000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
The Memorial Park car park is below standard.	D_4	Memorial Park car park.	307	Formalise car park and rationalise car park space.	PSC	2	by end 2010	30000
Foreshore Stability								
Many of the existing seawalls and rock revetments have not been built in accordance with sound coastal engineering principles.			308	Investigate feasibility of reconstructing seawalls and rock revetment in accordance with sound coastal engineering principles.	PSC, GLC, Dept of Lands	2	by end 2010	100000
Visual Amenity								
The visual amenity of this management zone is threatened by visually obtrusive public amenity blocks, signage, stormwater outlets, urban development and foreshore erosion and structures.			309	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline. Give effect to sustainability principles when determining development applications.	GLC, Dept Planning	2	Immediate and ongoing	NA
As above.			310	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.6 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	GLC, Dept Planning, Dept of Lands	1	Immediate and ongoing	NA
As above.			311	Investigate methods of screening stormwater outlets and/or installing alternatives such as artificial wetlands. See Section 7.2.4 .	GLC, CMA, MPA	3	by end 2010	5000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity (cont)								
As above.			312	Undertake a review of signage along the foreshore with a view to reducing the overall number of signs standardising their design and locating them in more appropriate locations. See Section 7.2.7 .	GLC, PSC, NSW Maritime, MPA, DECC, Dept Lands	2	by end 2012	80000
Water Quality								
The Karuah River catchment is affected by rural runoff.			313	Implement recommendations made in Urban Stormwater and Rural Water Quality Management Plan.	PSC, GLC, CMA	2	by end 2010	NA
Waterway Access and Facilities for Boat Users								
The Karuah Boat Ramp requires an upgrade to improve its functionality and increase its usage.	D_5	Karuah Boat Ramp.	314	Upgrade Karuah Boat Ramp to a regional scale facility.	PSC, NSW Maritime	1	by end 2010	100000
The Karuah Jetty requires an upgrade to increase its level of usage.	D_6	Karuah Jetty.	315	Upgrade jetty to complement regional scale boat ramp.	PSC	1	by end 2010	100000
The waterway access facilities (including adjacent reserve) in this management zone could be more intensively utilised.			316	Disseminate information about the range of waterway access facilities available through Council and community newsletters advertising in the local media tourist information and signage.	PSC, NSW Maritime	1	by end 2010	20000

12.14 Northern Shoreline of Inner Port Stephens (Management Zone E)

12.14.1 Summary

The main management issues identified in this Management Zone are:

- the estuarine vegetation along the foreshore has high conservation values and is mapped as SEPP 14 wetland. At least one Ecologically Endangered Community also occurs;
- current foreshore zoning does not take into consideration the unique ecological, scenic and potential recreational values of the area;
- many of the local scale waterway access facilities and foreshore reserves require upgrades. Some new facilities are also required; and
- there are many unauthorised seawalls, rock groynes, private boat ramps and other structures along village foreshores. The majority of these are not built according to sound coastal engineering standards.

The estuarine vegetation along the northern foreshore of Port Stephens is mapped as SEPP 14 wetlands. At least one Ecologically Endangered Community also occurs in the area. The undeveloped nature of this foreshore is a major contributor to the aesthetic amenity enjoyed from the southern foreshore. The objective of the most common zoning along the northern foreshore does not take this scenic value, or the conservation or potential recreational values of the area into consideration. Establishment of a Foreshore Environmental Protection Zone or an Estuary Foreshore DCP would provide recognition of these values and allow the foreshore to be managed as a contiguous land use unit. This area could also be considered for government acquisition, therefore providing for the long term conservation of the recreational, social, ecological, economic and visual values of the area for the benefit of Port Stephens as a whole.

There are a number of local-scale waterway access facilities and reserves along this section of the foreshore that require upgrades to improve their appearance and functionality. New facilities are also required in some areas. The following strategy has been identified (Jelliffe 2003):

- install local-scale boat ramp at North Arm Cove;
- install jetty at North Arm Cove;
- upgrade Bundabah Boat Ramp;
- upgrade Lower Pindimar Boat Ramp;
- install jetty at Lower Pindimar; and
- install local-scale boat ramp at Pindimar.

The landscaping and facilities in many of the small foreshore reserves within villages could also be improved for enjoyment at a local scale.

There are a large number of unauthorised seawalls, rock groynes and rock revetments, as well as access ways and private boat ramps and jetties along the foreshores of villages in this Management Zone. The majority of these have not been built to appropriate coastal

engineering standards. The village of North Arm Cove is located on bedrock that underlays a silty sandy beach. There are many areas of reclamation in front of residences in this location and much of this is now protected by vertical seawalls. These have a negative impact on visual amenity from the perspective of the water and opposite shoreline.

Rock revetments and vertical timber retaining walls have also been built along the Lower Pindimar foreshore. These have been built to address foreshore erosion which tends to occur where mangroves are absent from the nearshore zone. As well as investigating ways of rebuilding seawalls appropriately, the mangroves should be allowed to regenerate. Similar management actions should be considered for Pindimar and Orungall Point.

12.14.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
Number One Cove and Yalimbah Creek support important estuarine vegetation. SEPP14 wetland and the Coastal Saltmarsh EEC have been mapped here.	E_2	Number One Cove and Yalimbah Creek estuarine vegetation.	317	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	GLC	1	Immediate and ongoing	NA
The riparian vegetation between North Arm Cove and Pindimar Bay is significant remnant vegetation. EECs are likely to occur in this area. Preferred koala habitat occurs here.	E_1	Riparian vegetation along northern foreshore of Port Stephens.	318	Prepare and implement Comprehensive Koala Plan of Management for Great Lakes LGA.	GLC, DECC	1	by end 2010	60000
Upper North Arm Cove and Bundabah Creek support important estuarine vegetation. SEPP14 wetland and the Coastal Saltmarsh EEC have been mapped here.	E_3	Upper North Arm Cove and Bundabah Creek estuarine vegetation.	319	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	GLC	1	Immediate and ongoing	NA
Wobbecong Cove and Kore Kore Creek support important estuarine vegetation that has been mapped as SEPP14 wetland.	E_6	Wobbecong Cove and Kore Kore Creek estuarine vegetation.	320	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	GLC	1	Immediate and ongoing	NA
Foreshore Reserves and Facilities								
The Heros Reserve car park is below standard.	E_8	Heros Reserve car park.	321	Formalise car park and rationalise car park space.	GLC	3	by end 2012	20000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Reserves and Facilities (cont)								
The landscape and facilities of Bundabah Reserve ((Pleasant View Parade) require improvement.	E_13	Bundabah Reserve (Pleasant View Parade) and facilities (picnic tables).	322	Improve general landscaping and then maintain.	GLC	3	by end 2010	2000
The landscape and facilities of Bundabah Reserve (Bundabah Road) require improvement.	E_12	Bundabah Reserve (Bundabah Road) and facilities (picnic tables).	323	As above.	GLC	2	by end 2010	3000
As above.	E_12	As above.	324	Install more picnic tables and BBQs.	GLC	3	by end 2010	2000
As above.	E_12	As above.	325	Investigate feasibility of reconstructing seawalls and rock revetment in accordance with standard coastal engineering principles (consider entire northern foreshore).	GLC, Dept of Lands, private residents, MPA	2	by end 2010	100000
The landscaping of Lower Pindimar Foreshore Reserve could be improved.	E_14	Lower Pindimar Foreshore Reserve.	326	Improve landscaping of reserve include plantings.	GLC	2	by end 2010	2000
Foreshore Stability								
The majority of existing seawalls and other foreshore structures are unauthorised and have not been built in accordance with standard coastal engineering standards. For example, the numerous private structures in the North Arm Cove, Lower Pindimar and Pindimar areas.			327	Investigate feasibility of reconstructing seawalls and rock revetment in accordance with standard coastal engineering principles; and removal of rock groynes (consider entire northern foreshore).	GLC, Dept of Lands, MPA private residents	2	by end 2010	100000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore Stability (cont)								
The removal of mangroves appears to have resulted in foreshore erosion in the Lower Pindimar/Pindimar area.			328	Implement a community education program that informs people about the important ecological and foreshore stability values provided by mangroves/saltmarsh. Provide information about relevant legislation and potential penalties for removal.	GLC, DPI Fisheries, MPA	1	by end 2010	10000
Visual Amenity								
The visual amenity of this management zone is threatened by urban development and foreshore structures.			329	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline. Give effect to sustainability principles in planning decisions.	GLC, Dept Planning	2	Immediate and ongoing	NA
As above.			330	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.6 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	GLC, Dept Planning, Dept of Lands	1	by end 2017	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Water Quality								
New development sites may be having an impact on water quality through erosion and sedimentation.			331	Ensure Erosion and Sediment Control Plans are implemented.	GLC	1	Immediate and ongoing	NA
On-site septic systems are a potential threat to water quality.			332	Continue to implement On-Site Sewage Management Strategy. Consider the installation of a reticulated system in the long term.	GLC	1	by end 2012	NA
The landfill site and industrial area (that eventually drain to a wetland and Pindimar Bay) have been identified as potential pollution point sources.			333	Implement management recommendations in Tea Gardens Hawks Nest and Bulahdelah Stormwater Management Plan.	GLC	2	by end 2012	NA
There is a high potential for acid sulphate soils in parts of this management zone.			334	Implement LEP and DCP - Acid Sulphate Soils.	GLC	2	Immediate and ongoing	NA
There is no formal stormwater management strategy for the villages of Tahlee/Carrington North Arm Cove Bundabah Lower Pindimar or Pindimar.			335	Prepare Stormwater Management Plans for the villages of Tahlee/Carrington North Arm Cove Bundabah Lower Pindimar and Pindimar.	GLC, CMA	1	by end 2010	50000
Waterway Access and Facilities for Boat Users								
The Bundabah Boat Ramp requires an upgrade to improve safety and functionality.	E_17	Bundabah Boat Ramp.	336	Upgrade Bundabah Boat Ramp as prescribed in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC	2	now complete	60000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Waterway Access and Facilities for Boat Users (cont)								
The Lower Pindimar boat ramp requires an upgrade to improve safety and functionality.	E_18	Lower Pindimar Boat Ramp.	337	Upgrade Lower Pindimar Boat Ramp as prescribed Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC	2	by end 2010	60000
There is an under supply of dinghy racks in North Arm Cove.			338	Install dinghy racks at Casuarina Park (Eastslope Way) Waters Street reserve and Heros Bay Reserve.	GLC	3	by end 2012	6000
There is currently no formal boat ramp at Pindimar.			339	Install local scale boat ramp at Pindimar as prescribed in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC	2	by end 2010	100000
There is currently no public jetty within this management zone.			340	Install jetty at Lower Pindimar to complement upgraded boat ramp (as prescribed in Waterways Shore Facilities Management Strategy (Jelliffe 2003)).	GLC	4	by end 2017	200000
As above.			341	Install jetty at North Arm Cove as prescribed in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC, MPA, Dept of Lands	4	by end 2012	200000
There is no formal boat ramp at North Arm Cove.			342	Install local scale boat ramp as prescribed in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC, NSW Maritime, MPA, Dept of Lands	2	by end 2012	150000

12.15 Corrie Island and Corrie Channel (Management Zone F1)

12.15.1 Summary

The main management issue identified in this Management Zone is the large area of important estuarine vegetation on Corrie Island and on the Limestone foreshore which has been mapped as SEPP 14 wetland. An Ecologically Endangered Community has also been recorded in these locations. This Management Zone is relatively undeveloped and should be managed in a way that protects its natural values for the long term.

12.15.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
Corrie Island supports important estuarine vegetation that has been mapped as SEPP14 wetland. Scattered remnants of Coastal Saltmarsh EEC also occur.	F1_1	Corrie Island estuarine vegetation.	343	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> , <i>Noxious Weeds Act 1993</i> and relevant SEPPs.	GLC	1	Immediate and ongoing	NA
The Limestone foreshore supports important estuarine vegetation that has been mapped as SEPP14 wetland. Coastal Saltmarsh EEC has also been mapped here.	F1_4	Limestone foreshore estuarine vegetation.	344	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>EPBC Act 1999</i> , <i>Noxious Weeds Act 1993</i> and relevant SEPPs.	GLC	1	Immediate and ongoing	NA
Water Quality								
On-site septic systems are a potential threat to water quality.			345	Continue to implement On-Site Sewage Management Strategy.	GLC	1	Immediate and ongoing	NA
There is a high potential for acid sulphate soils in this management zone.			346	Implement LEP and DCP – Acid Sulphate Soils.	GLC	1	Immediate and ongoing	NA

12.16 Jimmys Beach and Yacaaba Headland (Management Zone F2)

12.16.1 Summary

The area behind Jimmys Beach supports saltmarsh habitat which is mapped as SEPP 14 wetland and an Ecologically Endangered Community. Jimmys Beach suffers from a long term erosion problem which is being addressed through a beach nourishment program. The area is also affected by a number of stormwater management issues. Actions that address this issue are identified in the *Tea Gardens Hawks Nest and Bulahdelah Stormwater Management Plan*.

12.16.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
The area behind Jimmys Beach supports saltmarsh habitat. The area is mapped as SEPP14 wetland as well as the Coastal Saltmarsh EEC.	F2_1	Jimmys Beach estuarine vegetation.	347	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>Noxious Weeds Act 1993</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	GLC	1	Immediate and ongoing	NA
Foreshore Stability								
Jimmys Beach suffers from a long term erosion problem.	F2_8	Jimmys Beach.	348	Continue to implement beach nourishment program placing small amounts of sand more frequently.	GLC	1	Immediate and ongoing	NA
Visual Amenity								
The visual amenity of this management zone is threatened by signage, urban development and foreshore erosion.			349	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline. Give effect to sustainability principles in development decisions.	GLC, Dept Planning	2	Immediate and ongoing	NA
As above.			350	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.6 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	GLC, Dept Planning, Dept of Lands, MPA	1	by end 2017	NA

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Visual Amenity (cont)								
As above. Signage needs rationalising and updating, review of design principles and array of signs at popular beach access points.			351	Undertake a review of signage along the foreshore with a view to reducing the overall number of signs standardising their design and locating them in more appropriate locations. See Section 7.2.7 .	GLC, PSC, NSW Maritime, MPA, DECC, Dept Lands	2	by end 2012	80000
Water Quality								
This management zone is affected by a number of stormwater management issues.			352	Implement recommendations made in Tea Gardens Hawks Nest and Bulahdelah Stormwater Management Plan.	GLC	2	by end 2012	NA
Waterway Access and Facilities for Boat Users								
Minor improvements could be made to the Anchorage Boat Ramp to improve functionality and safety.	F2_6	The Anchorage Boat Ramp	353	Implement minor upgrades to the Anchorage Boat Ramp as recommended in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC	1	by end 2010	20000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Foreshore reserves and facilities								
Access management issues: Beach access ways have an impact on the condition of dune vegetation, Car parking facilities and vehicle access to beaches impact on ecological values and the safety and amenity of other users		Jimmys Beach and Winda Woppa	354	Prepare an assessment of the condition, usage and context of beach access ways along the Winda Woppa-Jimmys Beach dunes. Prepare an access management plan addressing dune stabilisation, vegetation management, robust beach access (steps and ramps as necessary). Implement and monitor effectiveness, in conjunction with monitoring of beach condition (renourishment program). Formalise car parking facilities	GLC, Dept of Lands, DECC	1	By end 2010	20,000

12.17 Lower Myall River (Management Zone F3)

12.17.1 Summary

The majority of the Lower Myall River area supports estuarine vegetation that has been mapped as SEPP 14 wetland, as well as an Ecologically Endangered Community. The area should be managed in a way that ensures the long term conservation of this vegetation.

Tea Gardens is a popular tourist destination and is also becoming a more intensely populated residential area. The waterway access facilities in this area have the potential to be utilised by a larger number of people and to possibly reduce the pressure on the facilities on the southern foreshore. Specific improvements have been detailed in *Waterways Shores Facilities Management Strategy* (Jelliffe 2003).

A number of stormwater management issues also affect this area and have been addressed in the *Tea Gardens Hawks Nest and Bulahdelah Stormwater Management Plan*.

12.17.2 Identified Management Actions

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Ecological Habitat								
The foreshore of the lower Myall River supports important estuarine vegetation that has been mapped as SEPP14 wetland as well as the Coastal Saltmarsh EEC.	F3_2	Myall River estuarine vegetation.	355	Ensure compliance with relevant legislation and policies e.g. <i>EP&A Act 1979</i> , <i>TSC Act 1995</i> , <i>Noxious Weeds Act 1993</i> , <i>EPBC Act 1999</i> and relevant SEPPs.	GLC	1	Immediate and ongoing	NA
Visual Amenity								
The visual amenity of this management zone is threatened by signage and urban development.			356	Concentrate new development in existing urban areas and minimise development on ridgelines and the immediate shoreline.	GLC, Dept Planning	2	Immediate and ongoing	NA
As above.			357	Consider rezoning foreshore reserves to Foreshore Environmental Protection and/or develop Estuary Foreshore DCP. See Sections 8.1.1-8.1.6 and 8.12.1 for discussion of specific areas. Also see Figure 8.2 .	GLC, Dept Planning, Dept of Lands	1	by end 2017	NA
As above.			358	Undertake a review of signage along the foreshore with a view to reducing the overall number of signs standardising their design and locating them in more appropriate locations. See Section 7.2.7 .	GLC, PSC, NSW Maritime, MPA, DECC, Dept Lands	2	by end 2012	80000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Respons-ibility	Priority	Timeframe	Indicative Capital Cost \$
Water Quality								
A number of stormwater management issues affect this management zone.			359	Implement recommendations made in Tea Gardens Hawks Nest and Bulahdelah Stormwater Management Plan.	GLC	2	by end 2012	NA
Waterway Access and Facilities for Boat Users								
Improvements could be made to the East and West Public Wharves to improve their functionality.	F3_12	East and West Public Wharves.	360	Implement improvements to East and West Public Wharves as recommended in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC	2	by end 2012	80000
Improvements could be made to the Moira Street Boat Ramp to improve its functionality and safety.	F3_11	Moira Street Boat Ramp.	361	Implement improvements to Moira Street Boat Ramp as recommended in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC	1	by end 2010	60000
Improvements could be made to the Police Station Boat Ramp to improve its functionality and safety	F3_9	Police Station Ramp (Marine Drive/Ogden Street).	362	Implement improvements to Police Station Boat Ramp as recommended in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC	1	by end 2010	30000
Improvements could be made to the Tamboi Queen Jetty to improve its functionality.	F3_13	Tamboi Queen Jetty.	363	Implement improvements to Tamboi Queen Jetty as recommended in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC	2	by end 2012	40000

Management Issue	Asset No.	Asset Description	Mgt Action No.	Management Action	Responsibility	Priority	Timeframe	Indicative Capital Cost \$
Waterway Access and Facilities for Boat Users (cont)								
Minor improvements could be made to the Tea Gardens Regional Boat Ramp to improve its functionality and safety.	F3_8	Tea Gardens Regional Boat Ramp.	364	Implement improvements to Tea Gardens Regional Boat Ramp as recommended in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC	1	by end 2010	40000
The boat ramps in this management zone have the potential to be utilised more intensively.			365	Disseminate information about the range of waterway access facilities available through Council and community newsletters, advertising in the local media, tourist information and signage.	GLC, NSW Maritime	1	by end 2010	20000
The Old Police and Fisheries Wharves require redevelopment or demolition.	F3_14	Old Police and Fisheries Wharves.	366	Implement improvements to Old Police and Fisheries Wharves as recommended in Waterways Shore Facilities Management Strategy (Jelliffe 2003).	GLC, Dept of Lands, MPA	2	by end 2012	NA

12.18 Review of this Plan

This Plan should be reviewed in approximately three years (end of 2012). This will enable a review of progress, and the incorporation of any new issues and requirements with regard to the management of the foreshore.

13.0 References

- Armstrong, J 1996. *A History of Port Stephens. Yacaaba to Tomaree*. Port Stephens Council.
- Church J A, Hunter J, McInnes K, and White N Y 2004. Sea level rise and the frequency of extreme events around the Australian coastline. Coast to Coast 04. Australia's National Coastal Conference, Hobart, Tasmania.
- Church J A and N J White 2006. A twentieth century acceleration in global sea level rise. *Geophys. Res. Lett.*, 33, L01602, doi:10.1029/2005GL024826
- Department of Environment and Climate Change 2008. NSW Climate Change Action Plan: Regional Community Consultation Forums Resource Kit.
- Department of Natural Resources (Ed) 2002. Erosion and Sediment Control. Regional Policy and Code of Practice. Central Coast, Hunter, Karuah, Great Lakes and Manning Regions of NSW.
- Department of Planning 2006. Standard Instrument (Local Environmental Plans).
- DIPNR (Transport and Population Data Centre) 2004. NSW Statistical Local Area Population Projections 2001-2031.
- Earth Tech Engineering Pty Ltd 2006. Tilligerry Creek Catchment Management Plan. Report to Port Stephens Council.
- Eco Logical Australia 2005. *Port Stephens Wetland Identification and Prioritisation Study*. Report to Port Stephens Council.
- Eco Logical Australia 2005. *Port Stephens Wetland Management Report*. Report to Port Stephens Council.
- EJE Landscape Architects and Hunter Recreation Planning Consultants 1995. Shoal Bay Foreshore Management Plan and Landscape Strategy. Report to Port Stephens Council.
- Environmental and Earth Sciences 2000. *Strategic Guidelines for the Management of Acid Sulphate Soil in the Port Stephens and Anna Bay Catchments*. Report to Port Stephens Council.
- Geomarine 1994. Shoal Bay Sand Replenishment – Review of Environmental Factors. Report to Port Stephens Council.
- Great Lakes Council 2004. *Generic Plan of Management No 2. Natural Areas. Foreshores*.
- Great Lakes Council 2003. *Great Lakes Council Vegetation Strategy Eastern Portion V2 Vegetation Community Descriptions*.
- Hunter-Central Rivers Catchment Management Authority 2006. *Draft Catchment Action Plan*.

- Hunter, M 1998. *The Karuah River/Port Stephens Catchment Assessment Program*. Great Lakes Council, Port Stephens Council, Department of and Water Conservation, NSW Fisheries, Hunter Water Corporation, Environmental Protection Authority, NSW Health, Commonwealth Government.
- Hunter Valley Research Foundation 2002. *Port Stephens Council 2002 Community Survey. Summary Report*. Report to Port Stephens Council.
- Hunter Valley Research Foundation 2000. *Sydney Residents' Experiences in, and Perception of, the Hunter Region*.
- Intergovernmental Panel on Climate Change (IPCC), 2001. *Scientific Assessment of Climatic Change*. United Nations Environmental Program, IPCC Working Group 1.
- Intergovernmental Panel on Climate Change (IPCC), 2007. *Climate Change 2007: The Physical Science Basis – Summary for Policy Makers*. Contribution of Working Group 1 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.
- Jelliffe Environmental Pty Ltd 2003. *Waterways Shore Facilities Management Strategy for the Southern Areas of Great Lakes Council from Karuah to Bulahdelah*. Report to Great Lakes Council.
- Jelliffe Environmental Pty Ltd 2000. *Tea Gardens, Hawks Nest and Bulahdelah Stormwater Management Plan*. Report to Great Lakes Council.
- Laxton, J H 1997. *Shoal Bay Sand Replenishment Study Re-inspection Two Years after Replenishment*. Appendix C of Manly Hydraulics Laboratory (1998a)
- Lord D and Gibbs J 2004. *The Day after Tomorrow – the reality of climate change for coastal NSW*. Proceedings of the NSW Coastal Conference, Lake Macquarie.
- Manly Hydraulics Laboratory 1999. *Port Stephens/Myall Lakes Estuary Processes Study*. Report to Port Stephens and Great Lakes Councils
- Manly Hydraulics Laboratory 1999. *Shoal Bay Coastline Management Study*. Stages 4 and 5. Report to Port Stephens Council.
- Manly Hydraulics Laboratory 1998a. *Shoal Bay Coastline Hazard Study*. Stages 1 and 2. Report to Port Stephens Council.
- Manly Hydraulics Laboratory 1998b. *Shoal Bay Coastline Hazard Study*. Stage 3 – *Determination of Coastline Hazard Zones*. Report to Port Stephens Council.
- Manly Hydraulics Laboratory 1998c. *Port Stephens Flood Study – Stage 3 Foreshore Flooding*. Report to Port Stephens and Great Lakes Councils.
- Manly Hydraulics Laboratory 1997. *Port Stephens Flood Study – Stage 2. Design Water Levels and Wave Climate*. Report to Port Stephens and Great Lakes Councils.
- Marine Pollution Research Pty Ltd 1999. *Strategic Water Quality Monitoring Plan Karuah Catchment Assessment*. Report to Karuah-Great Lakes Catchment Management Committee.

- Martens & Associates Pty Ltd 1999. Broad Scale Study of On-Site Effluent Disposal Suitability in the Port Stephens Council LGA, NSW. Report to Port Stephens Council.
- McInnes K, Abbs D J, O'Farrell S P, McAdam I, O'Grady J and Ranasinghe R, 2007. Projected changes in climatological forcing conditions for coastal erosion in NSW. CSIRO project for DECC, 36pp.
- NPWS (2000). *Vegetation Survey, Classification and Mapping-LHCCREMS*.
- NPWS and Port Stephens Council 2005. *Soldiers Point Plan of Management*.
- NSW Maritime 2005. *Engineering Standards and Guidelines for Maritime Structures*
- NSW Public Works Department 1985. *Boat Launching Ramps Guidelines*
- Patterson Britton & Partners Pty Ltd 2005. Jimmys Beach Sand Extraction and Beach Nourishment Scheme. Statement of Environmental Effects. Report to Great Lakes Council
- Patterson Britton & Partners Pty Ltd 1997. *Port Stephens Foreshore Facilities Assessment. Wharf and Jetty Investigation*. Report to Port Stephens Council.
- Port Stephens Council 2005. *State of the Environment Report*.
- Port Stephens Council 2003. *Urban Stormwater and Rural Water Quality Management Plan*.
- Port Stephens Council 2001. *Foreshores Generic Plan of Management*.
- Port Stephens Council 2004. *2004 Community Profile*.
- Public Works Department NSW 1987. Port Stephens: Salamander Bay Physical Processes Data Base.
- Smith 2003. *Draft Great Lakes Heritage Study*. Report to Great Lakes Council.
- Standards Australia 2001. *Guidelines for Design of Marinas*.
- Stuart, A D 2004. *The Shorebirds of Port Stephens: Recent and Historical perspectives*. Hunter Bird Observers Club Inc, New Lambton, Australia.
- Umwelt (Australia) Pty Limited 2000a. *Port Stephens – Myall Lakes Estuary Management Plan*. Report to Port Stephens and Myall Lakes Estuary Management Committee.
- Umwelt (Australia) Pty Limited 2000b. *Port Stephens – Myall Lakes Estuary Management Study (Reference Document 2: Estuary Management Issues, Themes and Options for Port Stephens & Myall Lakes)*. Report to Port Stephens and Myall Lakes Estuary Management Committee.
- WP Geomarine 1997. *Tanilba Bay Erosion Management Study*. Report to Port Stephens Council.
- Webb, McKeown & Associates Pty Ltd 2002a. Port Stephens Foreshore (Floodplain) Management Study. Report to Port Stephens and Great Lakes Councils.

Webb, McKeown & Associates Pty Ltd 2002b. Port Stephens Foreshore (Floodplain) Management Plan. Report to Port Stephens and Great Lakes Councils.