



Manly Cove Coastal Zone Management Plan

An aerial photograph of Manly Cove, showing the dark green water of the cove, the sandy beach, and the surrounding residential area with many houses and buildings.

Final Report



November 2011



MANLY COVE COASTAL ZONE MANAGEMENT PLAN

Harbour Foreshores & Coastline Management Committee

After the Local Government election in September 2008, Manly Council established the Manly Harbour Foreshores & Coastline Management Committee in early 2009 to guide the preparation of a number of plans including the Manly Cove Coastal Zone Management Plan (CZMP). The first meeting of the Committee was held on 14 April 2009. Members of the Committee are:

Group	Representing Organisation	Name
Councillors	Manly Council	Dr. Peter Macdonald (Chair)
	Manly Council	Adele Heasman
	Manly Council	Jean Hay, AM (Mayor)
Community		Katie Harris
		Sylvia Bell
		Rod Childs
		Ross Thymin
		Richard Hewitt
		Ray Mathieson
		Carlo Bongarzone
Surf Clubs	Queenscliff SLSC	-
	North Steyne SLSC	Jo Cooper
	Manly SLSC	Ben Wotton
State Government	Office of Environment & Heritage (OEH)	Mark Moratti
	National Parks & Wildlife Services (OEH)	Peter Hay
	NSW Department of Primary Industries - Fisheries	Paul Schuettrumpf
	NSW Department of Primary Industries – Aquatic Protected	Rodney James
	NSW Maritime	Drew Jones
Council Staff	Manly Council	Rafiqul Islam

Coastal Focus Group

In order to support the Committee and to obtain expert contribution in the formulation of the CZMP, an informal in-house Coastal Focus Group consisting of relevant key staff was also formed. Members of this Group are:

Name	Position	Name	Position
Ted Williams	Senior Manager, Land Use & Sustainability	Judy Reizes	Community Projects Officer, Manly Environmental Centre
Eduard McPeake	Manager, Natural Resources and Environmental Partnership & Programs Branch	Zoran Popovic	Heritage Planner
Terry Jones	Manager, Rangers	Anna Nikolov	Social Planner
Tony Pavlovic	Manager, Urban Services	Emma Lynch	Waste Minimization & Education Officer
Jennie Minifie	Manager, Strategic Land Use Planning	Monique Needham	Team Leader, Sustainability
Fenton Beatty	Parks & Bushland Manager	Michael Galloway	Water Cycle Management Team Leader
Chris Kraus	Bushland Management Coordinator	Christina Femia	Catchments Project Officer
Paul Christmas	Planning & Strategy Coordinator	Janneke Lade	Environment Officer
Michael Biddulph	Architect	Rafiqul Islam	Estuary Management Officer

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Contributions of the Harbour Foreshore and Coastline Management Committee and internal 'Coastal Focus Group' are highly acknowledged. Laura Fraser, Dalene Amm, Andrew Read (OEH), also contributed in reviewing the document and their contributions are also acknowledged. Eco Divers contributed information and photograph of *Caulerpa taxifolia* in Manly Cove.

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i. EXECUTIVE SUMMARY

The Manly Cove Coastal Zone Management Plan (CZMP) was adopted by the Council at its Planning & Strategy Committee meeting on 7 November 2011. Prior to this, public exhibition of the Plan occurred during 20 June to 16 September 2011 and a final endorsement of the Plan by the Harbour Foreshores & Coastline Management Committee on 11 October 2011.

Supporting documents related to the Manly Cove CZMP include:

- Manly Cove Coastline Management Study, Manly Council, October 2009
- Davis Marina to Manly Point Coastline Hazard Definition Study, Patterson, Britton & Partners, 2004
- Natural Environment Assessment and Recommendations for the Coastline Management Plan: Manly Cove, GIS Environmental Consultants, March 2004
- Foreshore Safety and Beach Rehabilitation Manly Cove East, May 2003
- East Manly Cove Beach Management Options: Scoping Study, June 2002

About the Plan

This Plan is prepared through the process outlined in the NSW Coastline Management Manual (1990)¹. Extensive community consultation was conducted through mechanisms including, display panels, information sharing through Precinct newsletters and Council's webpage, formal questionnaire surveys and community Field Days.

This Plan addresses area that lies immediately to the north-west of the entrance to Sydney Harbour, bounded to the west by Federation Point and to the southeast by Manly Point. Manly Cove management area extends both seaward and landward from the shoreline and includes rocky intertidal platforms, sandy beaches, grassed recreational areas, a netted swimming enclosure, bushland as well as commercial, retail and residential areas. The study area covers 51 hectares and takes in the suburbs of Manly and Fairlight and also the local Precinct Community Forum areas of Fairlight, the Corso and Little Manly. The entire study area is covered within the Sydney Harbour Foreshores and Waterways Area and also within the Sydney Metropolitan Catchment Area.

The Plan has been developed in response to legislative requirements and community issues in accordance with current best practices for the management of estuaries and its catchment. The development of this Coastal Zone Management Plan is identified in Manly Plan 2010-2013 and Sustainability Strategy 2006.

Preparation of this CZMP is an action C1.3.1 (*develop and implement comprehensive Coastline Management Plans (CMPs) for all areas of foreshore in Manly*) of the Manly Sustainability Strategy 2006 (MC 2006). It supports strategy 'E2.1: Improve health of waterways, coasts and estuaries' of the draft North East Subregional Strategy (DoP 2007).

The Plan addresses the following ten broad based key issues, derived from community consultations:

- Aquatic/Inter-tidal Habitat Conservation & Management
- Boating, Maritime Operations & Facilities
- Enhancement of Public Facilities, Infrastructure & Signage
- Water Quality
- Terrestrial Ecosystem
- Climate Change & Coastal Hazards
- Waste Management
- Access & Traffic Management
- Geodiversity
- Heritage Conservation & Management

¹ The new 'Guidelines for Preparing Coastal Zone Management Plan' was gazetted on 31 December 2010. These Guidelines replaces Coastline Management Manual (NSW Government 1990) and Estuary Management Manual (NSW Government 1992). Preparation of Manly Cove CZMP started in 2005 and hence, continued to use processes described in Coastline Management Manual.

MANLY COVE COASTAL ZONE MANAGEMENT PLAN

This Coastal Zone Management Plan is a strategic plan with a long-term time frame of 15- 20 years and firmed up implementation program of 5 years. This plan will be reviewed and revised every 5 years and a new implementation program will be adopted in line with priorities of the period.

This Coastal Zone Management Plan has evolved through incorporation of strategic directions from a number of Council's management documents and land use planning instruments. In order to embed coastal zone management as part of Council's core business, the adopted Plan will link into documents such as: Manly Management Plan, Community Strategic Plan and Integrated Planning & Reporting Framework, other Coastal Zone Management Plans, Manly Local Environmental Plan, Development Control Plans (DCPs), and Plans of Management.

Strategic Framework & Management Strategy

A series of goals and objectives for the future management of the Manly Cove area were developed on the basis of information received through community and stakeholder consultation. For each management issue a goal has been defined, along with a range of management objectives that have been further translated into management options. The Plan follows the four basic principles of Ecologically Sustainable Development (ESD) and also considers the State Plan 2010, state-wide targets set by the Natural Resources Commission and regional targets set by the Sydney Metropolitan Catchment Management Authority (SMCMA).

This Plan sets 10 Goals and 25 Objectives to be addressed through 66 Management Options (**Table A**). Only 34 of these are new activities. Of these 34, seven management options are proposed for immediate implementation, 15 within 2 years, 10 within 3-4 years and only two at later years. Overall, 32 management options have been rated to have high priority, 29 as medium priority and five as low priority.

Strategic Management Options

Strategic management options cover a wide range of structural and non-structural solutions. These are briefly summarised here addressing each of the 10 key management issues.

Options addressing Aquatic/Intertidal Habitat Conservation & Management

A total of nine management options are proposed (Table A and detailed in Section 4.1) addressing three different objectives and relate to community involvement in the conservation of marine ecology, areas of ecological significance are managed in an integrated and sustainable manner and activities are carried out in a manner that improves the ecological condition of marine habitats.

Four management options have been rated as of high priority and relate to the establishment of a community-based seagrass monitoring program following a baseline survey on distribution and health of seagrass in Manly Cove and investigation of the infiltration of non-native seagrass, extension of the boundary of North Harbour Aquatic Reserve and assisting the OEH (former DECCW) with preparation, implementation of North Harbour Aquatic Reserve Management Plan and placement of seahorse habitat friendly net at Manly Cove. The remaining five management options have medium priority.

Four management options are already on-going activities. Two management options have been proposed for immediate implementation and relate to the establishment of a community-based seagrass monitoring program following a baseline survey on distribution and health of seagrass in Manly Cove and investigation of the infiltration of non-native seagrass and extension of the boundary of North Harbour Aquatic Reserve.

Options addressing Boating, Maritime Operations & Facilities

A total of eight management options are proposed (Table A and detailed in Section 4.2) addressing three different objectives and relate to improve the sustainability of boating activities, boating activities are conducted through positive interactions with other user groups and supporting recreational (and commercial) boating activities.

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Five management options have been rated as of high priority and relate to Manly Council Rangers are aware of oil & chemical spill response procedures, enhanced compliance of boating regulations, access and use the Manly Cove embayment, a wharf facility for public use in Manly Cove and ensure skiff rigging and storage activities accommodate other users of East Esplanade Reserve. The remaining three management options have medium priority.

Two management options are already on-going activities of Council. Two management options are proposed for immediate implementation and relate to a wharf facility for public use in Manly Cove and developing a long-term maritime infrastructure facilities plan for Manly LGA emphasizing boat storage and other infrastructures.

Options addressing Enhancement of Public Facilities, Infrastructures & Signage

A total of seven management options are proposed (Table A and detailed in Section 4.3) addressing three different objectives and relate to provision of well maintained and safe facilities and infrastructure, provision of up-to-date regulation and interpretive signage and reduction of the features that detract the visual quality of Manly Cove.

Four management options have been rated as of high priority and relate to upgrading of seating and picnic facilities within East and West Esplanade Reserves, providing freshwater bubblers within East and West Esplanade Reserves, replacement of damaged and/or missing signage and to ensure that new development complies with the landscape provisions of the Development Control Plan for Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005. The remaining two management options have medium priority and one low priority.

Two management options are already on-going activities of Council. No management option is proposed for immediate implementation.

Options addressing Water Quality

A total of eight management options are proposed (Table A and detailed in Section 4.4) addressing three different objectives and are related to a structured programme for water quality improvement, reduction of effluent discharge/ exfiltration from sewerage infrastructure and sustainable groundwater extraction practices.

Six management options have been rated as high priority and relate to formulation of a comprehensive Stormwater Management Plan, identifying opportunities for stormwater treatment, harvesting and reuse, feasibility of installing a new GPT, continuation of Manly Council Dry Weather Sewer Leak Investigation and Rectification Program, identifying recharge volume and extraction rates from aquifer and monitoring council bores for salinity and other parameters. The remaining two management options have medium priority.

Three management options are already on-going activities. One option is proposed for immediate implementation and relates to reviewing cleaning routine of existing GPTs within Manly Cove and feasibility of installing a new GPT.

Options addressing Terrestrial Ecosystem

A total of six management options are proposed (Table A and detailed in Section 4.5) addressing two different objectives: improving the ecological condition of terrestrial habitats and species and encouraging community participation.

Four management options have been rated as of high priority and relate to enhancement of remnant vegetation at Manly Point and Federation Point, planting of appropriate native species, managing Little Penguin Critical Habitat and provision of community education. The remaining two management options have medium priority. All management options are already on-going activities of Council.

Options addressing Climate Change & Coastal Hazards

A total of 14 management options are proposed (Table A and detailed in Section 4.6) to address five objectives: risk reduction to property and infrastructure resulting from Sea Level Rise, promoting understanding of the likely impacts of climate change, risk reduction from beach erosion and shoreline recession, risk reduction to slope and cliff instability and measures to address risk from tsunami.

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Five high priority management options are related to appropriate development on land identified as 'coastal risk areas', work within the emergency management frameworks identified in Local Emergency Management systems, develop and implement a natural shoreline and shoreline structure monitoring program, reissue of notifications to private property owners of identified coastal hazards and identification of emergency measures including evacuation routes in tsunami risk areas. The remaining eight management options have medium priority and one low priority.

Eight management options are already on-going activities of Council. The only option proposed for immediate implementation is to establish 'coastal risk areas' using NSW's planning sea level rise benchmarks.

Options addressing Waste Management

A total of six management options are proposed (Table A and detailed in Section 4.7) to address two different objectives: reduce waste while maximising re-use and recycling and to minimise risk to beach users and marine fauna from beach and marine waste.

Three management options have been rated as of high priority and relate to implementing Council adopted strategies to reduce waste, adequate recycling facilities in public areas and support community and business education programs. The remaining two management options have medium priority and one low priority.

Four management options are already on-going activities of Council. No option is proposed for immediate implementation.

Options addressing Access & Traffic Management

A total of four management options are proposed (Table A and detailed in Section 4.8) addressing one objective and relates to improvement of access for pedestrians, cyclists and water based recreation.

Three management options have been rated as of medium priority and the remaining one as low priority.

One management option is already an on-going activity of Council. No option is proposed for immediate implementation.

Options addressing Geodiversity

A total of two management options are proposed (Table A and detailed in Section 4.9) addressing one objective and relates to protection and conservation of Manly's geodiversity.

One management option has been rated as of medium priority and the other one as low priority.

One management option is proposed for immediate implementation and relates to undertaking a comprehensive assessment of geoheritage values of Manly LGA.

Options addressing Heritage Conservation & Management

A total of two management options are proposed (Table A and detailed in Section 4.10) to address two objectives: protection of all sites of Aboriginal heritage significance and sites of natural and cultural heritage.

Of these, one management option has been rated as of high priority and the other one as medium priority. Both two of the management options are on-going activities of Council.

Table A: Summary of Proposed Management Options

Objectives	Management Options	Responsible Agency (ies)	Performance target	Estimated Cost			Time Frame	Priority	Remarks
				Capital (\$)	Operational (\$)	Total			
(AH) AQUATIC/INTERTIDAL HABITAT CONSERVATION & MANAGEMENT									
Goal: Restore and maintain a healthy and diverse mix of aquatic and intertidal habitats that will maintain and improve biodiversity and ecological functions of Manly Cove.									
AH 1 To achieve community awareness of and involvement in the conservation of marine ecology through education and participation									
AH1.1. Involve the community and user groups in the provision of marine focussed educational events		MC (MEC, EPP)	Education programs continued	-	30,000	30,000	On-going	Medium	
AH1.2. Encourage the establishment of a community-based seagrass monitoring program following a baseline survey on distribution and health of seagrass in Manly Cove and investigation of the infiltration of non-native seagrass.		MC (EPP, NR) and NSW DPI	Survey & investigation completed; Participatory monitoring initiated	-	20,000	20,000	Immediate	High	
AH 2 Ensure all areas of ecological significance are managed in an integrated and sustainable manner									
AH2.1. Pursue a submitted proposal seeking the extension of the boundary of North Harbour Aquatic Reserve to include Manly Cove (Little Manly and North Harbour).		MC (NR), NSW DPI	North Harbour Aquatic Reserve expanded	-	-	Staff time	Immediate	High	
AH2.2. Assist NSW DPI with preparation and implementation of the North Harbour Aquatic Reserve Management Plan that also includes Manly Cove.		NSW DPI, NSW Maritime, Manly Council (NR)	Management Plan prepared & implemented	-	-	Staff time	Within 2 years	High	
AH2.3 Protect and enhance marine/intertidal habitats within and adjacent to Manly Cove		NSW DPI, MC (NR)	Proposed intertidal areas declared as IPA	-	-	Staff time	Within 2 years	Medium	
AH2.4. Continue to encourage NSW DPI to support conservation of seagrass beds in Manly Cove.		MC (NR), NSW DPI	Areas of seagrass beds conserved	-	-	Staff time	On-going	Medium	
AH.2.5 Replacement of the suspended netting currently used for the swimming enclosure at Manly Cove with seahorse habitat friendly net.		MC (NR)	Disturbance to seahorse habitat minimised	-	\$85,000	\$85,000	Within 2 years	High	
AH 3 To ensure the activities within Manly Cove are carried out in a manner that maintains or improves the ecological condition of marine habitats and species									
AH3.1. Encourage recreational fishing but minimise the impact that recreational fishing activities have on the intertidal and marine ecology, through education and regulation		NSW DPI, MC (Rangers, EPP)	Education program implemented	-	-	Staff time	On-going	Medium	
AH3.2. Minimise the impact of diver/snorkeler activities and routine maintenance upon the colony of seahorses known to colonise the Manly Cove netted swimming enclosure.		MC (MEC, EPP, NR),	Diving minimised	-	-	Staff time	On-going	Medium	
(BF) BOATING, MARITIME OPERATIONS & FACILITIES									
Goal: To achieve the highest level of environmental protection and safety for maritime operations within Manly Cove									
BF.1 To improve the sustainability of boating activities in Manly Cove									
BF.1.1 To encourage boat user groups to play a role in educating the boating community on best practice		MC (EPP)	Education programme initiated	-	25,000	25,000	Within 2 years	Medium	



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Objectives	Management Options	Responsible Agency (ies)	Performance target	Estimated Cost			Time Frame	Priority	Remarks
				Capital (\$)	Operational (\$)	Total			
BF.1.2 Ensure Manly Council Rangers are aware of Spill Response Procedures for both on-water and off-water incident		MC (EPP)	Education programme initiated	-	-	Staff time	Within 2 years	High	
BF.2 To ensure boating activities are conducted through positive interactions with other user groups									
BF.2.1 Encourage compliance with NSW Maritime boating regulations		MC (EPP, Rangers), NSW Maritime	Compliance regulations increased	-	-	Staff time	On-going	High	
BF.2.2 Sustainably manage the extent to which commercial operators access and use the Manly Cove embayment		NSW Maritime	Sustainable management of the area	-	-	Staff time	Between 2-4 years	High	
BF.2.3 Ensure skiff rigging and storage activities accommodate other users of East Esplanade Reserve		MC (CEC)	Acceptable sharing of the reserve ensured	-	-	Staff time	On-going	High	
BF.3 To support recreational (and commercial) boating activity through the provision of safe, user friendly facilities									
BF.3.1 Work with NSW Maritime to modify and improve a wharf facility for public use in Manly Cove		NSW Maritime, MC (NR)	Public wharf identified, improved and used	-	60,000	60,000	Immediate	High	
BF.3.2 Encourage NSW Maritime, NSW DPI and boat owners to install seagrass friendly moorings throughout Manly Cove		NSW Maritime, NSW DPI and MC (NR)	Additional moorings installed	-	-	Staff time	Between 3-4 years	Medium	
BF.3.3 Develop a long-term maritime infrastructure facilities plan for Manly LGA emphasizing boat storage facilities and other infrastructures		MC (NR), NSW Maritime	Plan developed	-	-	Staff time	Immediate	Medium	
(PF) PUBLIC FACILITIES, INFRASTRUCTURE & SIGNAGE									
Goal: Public facilities, infrastructure and signage are upgraded and maintained to facilitate improved social amenity									
PF.1 To provide well maintained and safe facilities and infrastructure on Manly Council owned and/or managed public lands									
PF.1.1 Prepare and implement an updated Landscape Masterplan for the Esplanade Reserve		MC (SLUP, Parks & Bushland and US)	Masterplan prepared, adopted and implemented	-	36,000	36,000	Immediate	Medium	
PF.1.2 Upgrade seating and picnicking facilities within East and West Esplanade Reserves		MC (US)	Facilities enhanced	-	75,000	75,000	Within 2 years	High	
PF.1.3 Community needs are facilitated in areas along the Esplanade Reserves		MC (US)	Facilities enhanced	-	40,000	40,000	Within 2 years	High	
PF.1.4 Provide freshwater bubblers within East and West Esplanade Reserves.		MC (UR)	New water bubblers installed	20,000	-	20,000	Within 2 years	High	



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Objectives	Management Options	Responsible Agency (ies)	Performance target	Estimated Cost			Time Frame	Priority	Remarks
				Capital (\$)	Operational (\$)	Total			
PF.2 Provide up-to-date regulation and interpretive signage appropriate for the locality and which meets Councils legislative requirements									
PF.2.1 Undertake review of existing compliance signage which meets Councils legislative requirements		MC (SLUP)	Review completed	-	-	Staff time	On-going	Low	
PF.2.2 Replace damaged and/or missing signage in line with findings of signage audit and to reduce negative impacts upon visual character of Manly Cove through signage consolidation		MC (US & NR)	Signage replaced with new ones	-	40,000	40,000	Between 3-4 years	High	
PF.3 Reduce the adverse impacts of features that detract from the visual quality of Manly Cove									
PF.3.1 Ensure all new development complies with the landscape provisions of the Development Control Plan for Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.		MC (DAU)	Features of the area maintained	-	-	Staff time	On-going	High	
(WQ) WATER QUALITY									
Goal: To ensure water quality meets the community's expectations and falls within acceptable standards suitable for fishing and swimming									
WQ.1 Initiate and implement structured programme for water quality improvement									
WQ.1.1 Formulate a comprehensive Stormwater Management Plan for Manly LGA encompassing the study area		MC (US-MCMT)	Management Plan completed	-	70,000	70,000	5 th year	High	
WQ.1.2 Identify and implement opportunities for stormwater treatment, harvesting and reuse within Manly Cove		MC (US-MCMT)	Stormwater is reused	-	30,000	30,000	Between 3-4 years	High	
WQ.1.3 Review cleaning routine of existing GPTs within Manly Cove and assess feasibility of installing a new GPT (Gross Pollutant Trap)		MC (US-MCMT)	GPT installed	-	60,000	60,000	Immediate	High	
WQ.2 Encourage a reduction of effluent discharge/ exfiltration from sewerage infrastructure in the Manly Cove study area									
WQ.2.1 Continue to liaise with Sydney Water to ensure that all sewage overflows (and pumping stations) operate within established licensing requirements		Sydney Water, MC (US-MCMT)	All overflow points and pumping stations operate within performance standard	-	-	Staff time	On-going	High	
WQ.2.2 Continue to Implement <i>Manly Council Dry Weather Sewer Leak Investigation and Rectification Program in Manly</i> , to identify sewer leaks from private or Sydney Water sewers where they enter Council's stormwater system		MC (US-MCMT)	Program continued	-	25,000	25,000	On-going	High	
WQ.3 Ensure sustainable groundwater extraction practices to avoid negatively impacting upon aquifer recharge and quality									
WQ.3.1 Undertake a comprehensive study on the Manly Cove aquifer to identify recharge volumes and to ensure sustainable extraction rates		MC (US-MCMT) & NSW Office of Water (DPI)	Study report completed	-	40,000	40,000	Between 3-4 years	Medium	
WQ.3.2 Monitor council bores for salinity and other parameters to ensure extraction does not lead to contamination		MC (EH, US-MCMT, NR)	Salinity & other parameters monitored	-	10,000	10,000	Within 2 years	Medium	



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Objectives	Management Options	Responsible Agency (ies)	Performance target	Estimated Cost			Time Frame	Priority	Remarks
				Capital (\$)	Operational (\$)	Total			
WQ.3.3 Ensure Council staff working with or assessing groundwater issues are familiar with the SCCG Groundwater Management Handbook 2006		MC (NR, EH, DAU)	SCCG Handbook is used	-	-	Staff time	On-going	High	
(TE) TERRESTRIAL ECOSYSTEM									
Goal: To conserve and enhance the integrity and diversity of indigenous terrestrial flora and fauna and their ecosystems									
TE.1 To ensure the activities within Manly Cove are carried out in a manner that maintains or improves the ecological condition of terrestrial habitats and species									
TE.1.1 Maintain and enhance remnant vegetation at Manly Point and Federation Point to improve on the habitat for the Little penguin population		MC (Parks & Bushlands)	Remnant vegetation maintained	-	-	Staff time	On-going	High	
TE.1.2 Encourage planting of native flora species on private and public lands to provide improved potential foraging and nesting habitat for the Long-nosed Bandicoot		MC (Parks & Bushlands)	Native vegetation maintained & enhanced	-	15,000	15,000	On-going	Medium	
TE.1.3 Ensure that Council's Street Tree Planting Program results in the planting of appropriate native species		MC (Parks & Bushlands)	Recommended list prepared and program continued	-	50,000	50,000	On-going	High	
TE.1.4 Continue work with OEH to manage Little Penguin Critical Habitat, the Wildlife Protection Area at Federation Point and known nesting sites in line with the Manly Little Penguin Recovery Plan.		MC (NR, Precincts)	WPA maintained and continued	-	-	Staff time	On-going	High	
TE.1.5 Continue enhanced weeding program at high weed density areas on a priority basis.		MC (Parks & Bushlands)	Weed density lowered	-	15,000	15,000	On-going	Medium	
TE.2 To achieve community awareness of and involvement in the conservation of terrestrial ecology through education and participation									
TE.2.1 Continue to provide community education in line with actions identified in the Manly Little Penguin Recovery Plan and Draft Long-nosed Bandicoot Recovery Plan.		MC (EPP, Parks & Bushlands)	Recovery Plans are supported with increased community participation	-	-	Staff time	On-going	High	
(CH) CLIMATE CHANGE & COASTAL HAZARDS									
Goal: Assess, monitor and mitigate risks from coastline hazards and climate change									
CH.1 To reduce to an acceptable level, the risk to property and infrastructure resulting from Sea Level Rise									
CH.1.1 Establish 'coastal risk areas' using NSW's planning sea level rise benchmarks		MC (NR, SLUP)	Coastal risk areas identified, mapped and adopted	-	120,000	120,000	Immediate	Medium	
CH.1.2 Ensure appropriate development on land identified as 'coastal risk areas'.		MC (SLUP, DAU, NR)	Appropriate development of coastal risk areas ensured	-	-	Staff time	On-going	High	
CH.1.3 Adopt an adaptive risk-based approach to managing climate change including sea level rise impacts		MC (NR, US), Precincts	Positive measurable impacts achieved	-	70,000	70,000	On-going	Medium	
CH.1.4 Work with regional, state and federal bodies to ensure consistent adaptation planning		SCCG, OEH, MC (NR, SLUP)	Improved and continued collaboration	-	-	Staff time	On-going	Medium	
CH.1.5 Work within the emergency management frameworks identified in Local		MC (US, NR), SES	Emergency Action Plan Updated	-	-	10,000	On-going	High	



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Objectives	Management Options	Responsible Agency (ies)	Performance target	Estimated Cost			Time Frame	Priority	Remarks
				Capital (\$)	Operational (\$)	Total			
Emergency Management systems during times of floods and storms									
CH.2 Promote understanding of the likely environmental, social and economic impacts of climate change									
CH.2.1	Continue to provide updated information to the public about climate change including sea level rise and their impacts	MC (EPP, NR, MEC), Precincts	Booklet published and distributed	-	15,000	15,000	On-going	Medium	
CH.2.2	Incorporate latest climate change information into management decisions	MC (NR, SLUP)	Climate change directions and requirements are publicised widely	-	-	Staff time	Within 2 years	Medium	
CH.3 Reduce to an acceptable level, the risk of damage as a result of beach erosion and shoreline recession									
CH.3.1	Develop and implement a natural shoreline and shoreline structure monitoring program for Manly Cove East and West Beaches	MC (US & NR)	Regular inspection report	-	50,000	50,000	Within 2 years	High	
CH.3.2	Consider beach nourishment to reduce the risk from beach erosion	MC (US & NR), SCCG	Beach nourishment programme initiated	TBD	TBD	TBD	5 th year	Medium	
CH.3.3	Should the risk of damage to the existing seawall due to the effects of beach erosion and recession in the future become unacceptable, evaluate and implement the available management options	MC (US & NR)	Regular inspection report	-	-	Staff Cost	On-going	Medium	
CH.4 To reduce to an acceptable level, the risk to property and risk to life as a result of slope and cliff instability									
CH.4.1	Continue the staged remediation of cliff and slope instability on public lands based upon the level of risk posed to life and /or property and in line with recommendations of the Davis Marina to Manly Point CHDS	MC (US & NR)	Reduction of hazards from cliff & slope instability	-	250,000	250,000	On-going	Medium	
CH.4.2	Reissue notifications to private property owners of identified coastal hazards potentially affecting their land and a reminder the information has been recorded on the properties S.149 Certificate	MC (Regulatory Compliance)	Reissuing of notification finalised	-	-	Staff time	On-going	High	
CH.5 Undertake measures to address risk from tsunami									
CH.5.1	Map tsunami risk areas	SES	Tsunami map completed	-	40,000	40,000	Within 2 years	Low	
CH.5.2	Identify, with SES, emergency measures including evacuation routes.	SES, MC (US)	Evacuation routes identified and agreed	-	5,000	5,000	Between 3-4 years	High	
(WM) WASTE MANAGEMENT									
Goal: Promote and facilitate sustainable waste management in Manly Cove									
WM.1 To reduce waste while maximising re-use and recycling in the Manly Cove study area									
WM.1.1	Implement Council adopted strategies to reduce waste in Manly Cove	MC (WC)	Strategies are implemented	-	-	Staff time	On-going	High	
WM.1.2	Ensure adequate recycling facilities are provided in public areas and encourage responsible disposal of litter within the study area	MC (WC)	Educational program intensified	-	-	Staff time	On-going	High	
WM.1.3	Continue to conduct and support community and business education programs to avoid litter production at source	MC (WC, EPP)	Educational programs continued	-	10,000	10,000	On-going	High	



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Objectives	Management Options	Responsible Agency (ies)	Performance target	Estimated Cost			Time Frame	Priority	Remarks
				Capital (\$)	Operational (\$)	Total			
WM.2 To minimise risk to beach users and marine fauna from beach and marine waste while maintaining natural ecosystems									
WM.2.1	Continue to operate the existing beach raking regime and try hand picking as an alternative from Manly Cove beaches	MC (CS)	Knowledge gained and applied	-	30,000	30,000	Within 2 years	Medium	
WM.2.2	Conduct litter audit to determine sources of rubbish to inform treatment and education programs	MC (CS)	Litter audit completed	-	20,000	20,000	5th year	Low	
WM.2.3	Encourage NSW Maritime to improve its water-based litter and debris cleaning regime	MC (CS), NSW Maritime	Increased collection efforts	-	-	Staff time	On-going	Medium	
(AM) ACCESS & TRAFFIC MANAGEMENT									
Goal: To provide an environment at Manly Cove that is accessible to all people									
AM.1 To improve and control access for pedestrians, cyclists, water based recreation and servicing vehicles, minimising conflicts and negative impacts									
AM.1.1	Encourage NSW Maritime lessees to improve beach access and public amenity immediately east of the Manly Wharf development	MC (US), NSW Maritime, Manly Wharf	Improved beach access	-	-	Staff time	On-going	Medium	
AM.1.2	Audit disability access of all parks and access ways within the study area	MC (SLUP)	Audit completed	-	20,000	20,000	Within 2 years	Medium	
AM. 1.3	Rebuild the ramp at the rear of the Manly Art Gallery that is wheelchair accessible	MC (US)	Redesigned ramp completed	100,000	-	100,000	Between 3-4 years	Medium	
AM.1.4	Investigate the feasibility of constructing an underground pedestrian pathway to link Manly Wharf with the Corso	MC (US), RTA, Manly Wharf	Feasibility Study completed	-	100,000	100,000	Between 3-4 years	Low	
(GD) GEODIVERSITY									
Goal: Conserve the significant geodiversity elements of the area's coastline									
GD.1 To protect and conserve the important elements of Manly's geodiversity through raising awareness, considering its values in all planning and management and integrating with biodiversity and cultural heritage management									
GD.1.1	Undertake a comprehensive assessment of geoheritage values of Manly LGA	MC (SLUP, NR)	Study completed	-	20,000	20,000	Immediate	Low	
GD.1.2	Ensure that geoheritage issues are considered during development assessment processes	MC (SLUP, DAU)	DA assessments to consider geoheritage	-	-	Staff time	Between 3-4 years	Medium	
(HC) HERITAGE CONSERVATION & MANAGEMENT									
Goal: Ensure that all Aboriginal and European (cultural and natural) heritage sites are preserved and protected									
HC 1 Ensure that sites of Aboriginal heritage are protected and appropriately maintained.									
HC1.1.	Review Aboriginal Site Management Report for Manly Council (2006) and associated reports to prioritise management needs and develop a plan of implementation.	AHO and MC (SLUP)	Prioritisation done	-	-	Staff time	On-going	Medium	
HC2 Ensure that all sites of non-indigenous heritage are protected under relevant legislations and in Council planning instruments.									
HC2.1.	Ensure physical protection and maintenance of all heritage listed items.	MC (SLUP, Urban Services)	Maintained & protected	-	60,000	60,000	On-going	High	

Funding Requirements

The total cost of implementing (including 1-5 years of operation and maintenance) the 66 management options addressing 10 key management issues is \$1,616,000 (**Table B**).

Table B: Summary of estimated cost

Management Issues	Number of Management Options	Estimated Indicative Cost (\$)			
		High priority	Medium Priority	Low priority	Total
Aquatic Habitat	9	0	50,000	0	50,000
Boating Facilities	8	60,000	65,000	0	125,000
Public Facilities	7	115,000	56,000	0	171,000
Water Quality	8	185,000	50,000	0	235,000
Terrestrial Ecology	6	50,000	65,000	0	115,000
Hazards & Climate Change	14	65,000	455,000	40,000	560,000
Waste Management	6	10,000	30,000	20,000	60,000
Access	4	0	120,000	100,000	220,000
Geodiversity	2	0	0	20,000	20,000
Heritage Conservation	2	60,000	0	0	60,000
	66	545,000	891,000	180,000	1,616,000

Some actions require an on-going commitment from existing staff rather than the outlay of expenditure and this is noted as 'Time'. Some recommended actions require significant capital costs, especially where large-scale works are involved such as beach nourishment.

As indicated elsewhere, implementation responsibility of all proposed management options rests with a number of agencies including Manly Council. Hence, adoption of this CZMP does not commit Council to allocate immediate funding. Funding from different alternative sources will be pursued (**Appendix B**). These include but are not limited to:

- Council's Environment Levy (subject to a budget bid process);
- Council's General Revenue Budget (subject to a budget bid process);
- State Government's Coastal & Estuary Management Program (50% subsidy funding subject to a submission process);
- Other Commonwealth and State Government funded programs such as SSHAP, MIP, NRDGS, Greenspace, CMA Funding etc

Implementation Plan

Agencies involved: Manly Council (MC) is the principal implementation/management agency of the Manly Cove Coastal Zone Management Plan. Responsibility for implementing the options is spread across local government (planning, management and works staff), state government agencies and volunteer community groups. The following agencies will likely to be involved in implementation of one or more relevant management options either in the main or supporting roles.

- NSW Maritime;
- NSW Department of Primary Industries (NSW DPI);
- Office of Environment & Heritage (OEH);
- NSW Parks & Wildlife Services (NPWS – OEH)
- Office of Water
- State Emergency Services (SES);
- Roads & Transport Authority (RTA)
- Sydney Water;
- Sydney Ferries Corporation;
- Manly Wharf Management;
- Sydney Coastal Councils Group (SCCG); and

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- Aboriginal Heritage Office (AHO).

Implementation Time frame: Of 66 management options proposed in this CZMP, 32 options are on-going activities of the Council and/or other agencies. Among newly proposed 34 options, seven management options are proposed for immediate implementation, 15 within 2 years, 10 within 3-4 years and only two at later years.

Seven management options proposed for immediate implementation are:

- AH.1.2 Encourage the establishment of a community-based seagrass monitoring program following a baseline survey on distribution and health of seagrass in Manly Cove and investigation of the infiltration of non-native seagrass.
- AH.2.1 Pursue a submitted proposal seeking the extension of the boundary of North Harbour Aquatic Reserve to include Manly Cove (Little Manly and North Harbour).
- BF.3.1 Work with NSW Maritime to modify and improve a wharf facility for public use in Manly Cove
- BF.3.3 Develop a long-term maritime infrastructure facilities plan for Manly LGA emphasizing boat storage facilities and other infrastructures
- WQ.1.3 Review cleaning routine of existing GPTs within Manly Cove and assess feasibility of installing a new GPT (Gross Pollutant Trap)
- CH.1.1 Establish 'coastal risk areas' using NSW's planning sea level rise benchmarks
- GD.1.1 Undertake a comprehensive assessment of geoheritage values of Manly LGA

Management options, BF3.3, CH1.1 and GD1.1 are already being implemented in November 2011.

Mainstreamed into the Council's Integrated Plans (incorporating the Community Strategic Plan Beyond 2021, Resourcing Strategy and Four Year Delivery Program 2011-2015 and One Year Operational Plan 2011-2012): The management options proposed in this Coastal Zone Management Plan will gradually be mainstreamed in to the rolling four year Manly Council Delivery Program and Operational Plan. The Manly Council's Integrated Plans will be the key planning documents driving the operations of Council during the next ten years and beyond. Efforts will be made to incorporate priority options in to the next Manly Delivery Program 2011 – 2015 and subsequent Plans.

Collaborative Partnership with other agencies and neighbouring Councils: Manly Council, as being the main implementer of the CZMP, plans to conclude collaborative partnership agreements with other relevant agencies and neighbouring Councils either specifically for this CZMP or for overall LGA.

Manly Harbour Foreshores & Coastline Management Committee to coordinate: Manly Harbour Foreshores & Coastline Management Committee will co-ordinate strategic implementation of the CZMP. The Committee, will be serviced by the Coastal Management Team of Council

Opportunities for community involvement: Many of the management strategies adopted for Manly Cove CZMP offer opportunities for community involvement particularly activities such as bush regeneration projects, participatory monitoring programs and environmental education, as well as general monitoring of plan implementation and effectiveness.

Reporting through three mechanisms: Reporting on implementation of the CZMP will be achieved through three mechanisms: regular Harbour Foreshore and Coastline Management Committee meetings, reporting to the community and other formal and informal reporting processes, such as Annual Report, Regional SoE Report, Council website.

CZMP to be reviewed every 5 years: The Manly Cove Coastal Zone Management Plan will be reviewed every 5 years to accommodate priorities of the period, requirements of new/amended legislations and Council's policies and guidelines. However, It is likely that this revision will happen earlier to prepare revised CZMPs based on new NSW Government guideline and a consolidation of a number of CZMPs. During the process, there will be a mechanism to identify new issues and conflicts concerning the coastal zone management and ensure their incorporation into a revised plan. A program for the following 5 years will be developed by

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designating priority to any new actions and reassigning priority to the remaining actions. These programs should be fed back into and form the revised CZMP for the next 5 years.

Monitoring, Evaluation & Reporting

Monitoring & evaluation is a key component of any coastal zone management plan. At present, Council has no structured & written monitoring plan to assess environmental health of coast & estuary. However, the SHOROC State of the Environment Report, prepared annually in collaboration with other regional Councils, provides numerical data on a comprehensive range of indicators. Long-term water quality monitoring data is, however, available at present from the 'Harbour Watch Program' and 'Beach Watch Program' of the Office of Environment & Heritage (OEH). The National NRM Monitoring and Evaluation Framework (NM&EF) has identified a total of 19 nationally agreed indicators to measure the effect of the stressors on ecosystem condition (physical/chemical and biological) and habitat extent. Based on this, 25 indicators have been proposed to monitor Manly's Estuarine, Coastal & Marine Habitat Integrity.

ii. ABBREVIATIONS

ABS	Australian Bureau of Statistics
AHD	Australian Height Datum
AHO	Aboriginal Heritage Office
CAP	Catchment Action Plan
CCM	Care, Control & Management
CCP	Cities for Climate Protection
CMA	Catchment Management Authority
CMP	Coastline Management Plan
CSIRO	Australia's Commonwealth Scientific and Industrial Research Organisation
CZMP	Coastal Zone Management Plan
DCP	Development Control Plan
DECCW	The former NSW Department of Environment and Climate Change and Water (at present OEH)
DPI	NSW Department of Primary Industries
DWE	NSW Department of Water & Energy
EPBC	Environment Protection & Biodiversity Conservation (Act)
EPI	Environmental Planning Instrument (includes LEP, REP and SEPP)
ESD	Ecologically Sustainable Development
GIS	Geographic Information System
GPT	Gross Pollution Trap
GSE	Graduate School of Environment, Macquarie University
ICZM	Integrated Coastal Zone Management
IPA	Intertidal Protected Area
IPCC	Inter-Governmental Panel for Climate Change
LEP	Local Environmental Plan
LG	Local Government
LGA	Local Government Area
MC	Manly Council
MEC	Manly Environment Centre
MIP	Marine Infrastructure Projects
MLALC	Metropolitan Local Aboriginal Land Council
MSL	Mean Sea Level
MSW	Manly Scenic Walkway
MSS	Manly Sustainability Strategy
NH	North Harbour
NHR	North Harbour Reserve
NRC	Natural Resources Commission
NSW	New South Wales
OEH	Office of Environment & Heritage (formerly DECCW)
PoM	Plan of Management
REP	Regional Environmental Plan
SCCG	Sydney Coastal Council Group
SEPP	State Environmental Planning Policy
SES	State Emergency Services
SHOROC	Shore Regional Organisation of Councils
SLR	Sea Level Rise
SMCMA	Sydney Metropolitan Catchment Management Authority
SREP	Sydney Regional Environmental Plan
SSHAP	Sharing Sydney Harbour Access Program
TSC	Threatened Species Conservation (Act)
WPA	Wetland Protection Area

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1. ABOUT THE PLAN

1.1 TITLE

This plan is the *Manly Cove Coastal Zone Management Plan*.

1.2 MANAGEMENT AREA

The Manly Cove study area lies immediately to the north-west of the entrance to Sydney Harbour, bounded to the west by Federation Point and to the southeast by Manly Point (see **Figure 1.2**). The study area covers 51 hectares and takes in the suburbs of Manly and Fairlight and also the local Precinct Community Forum areas of Fairlight, the Corso and Little Manly.

It extends both seaward and landward from the shoreline and includes rocky intertidal platforms, sandy beaches, grassed recreational areas, a netted swimming enclosure, bushland as well as commercial, retail and residential areas. The study area covers twelve sub-catchments.

The study area includes Manly Cove West Beach and Manly Cove East Beach, the seawalls backing these beaches, sandstone cliff faces and wave cut intertidal platforms as well as a number of water based development including Manly Wharf and various boating facilities lining the eastern foreshore.

The study area consists primarily of semi-natural, landscaped and built areas. It is characterized by natural and cut sandstone cliffs and escarpments with fringing native bushland pockets and landscaped areas along the Esplanade Reserves.

Manly Cove is a popular location for both visitors and locals alike. The Manly Scenic Walkway, a 10km scenic harbour walking track extending from the Spit Bridge to Manly, directs large numbers of walkers along the length of the study area. Manly Wharf also forms a vital transport link between the Northern Beaches and Sydney CBD.

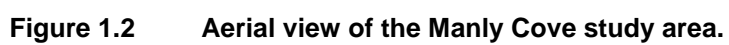
Land and aquatic areas outside the study area boundaries, which impact on the biophysical or social environment within the boundary, have also been considered in development of the CZMP in order to establish holistic management strategies.

North Harbour Aquatic Reserve lies very close to the study area. A new proposal to extend the North Harbour Aquatic Reserve to include the entire water side of the study area is now being considered by the Department of Primary Industries (DPI).

The study area of Manly Cove extends to areas beyond the care and control of Manly Council. This is to provide a comprehensive approach to the identification and resolution of issues affecting the study area, including those that relate to the land-water interface. It will also provide an opportunity to bring together the various government agencies involved and through a whole of government approach identify strategies and actions for the future management of the area.

The study area borders areas covered by Little Manly and North Harbour Coastline Management Plans.

The entire study area is within the Sydney Harbour Foreshores and Waterways Area and Sydney Metropolitan Catchment Management Area.



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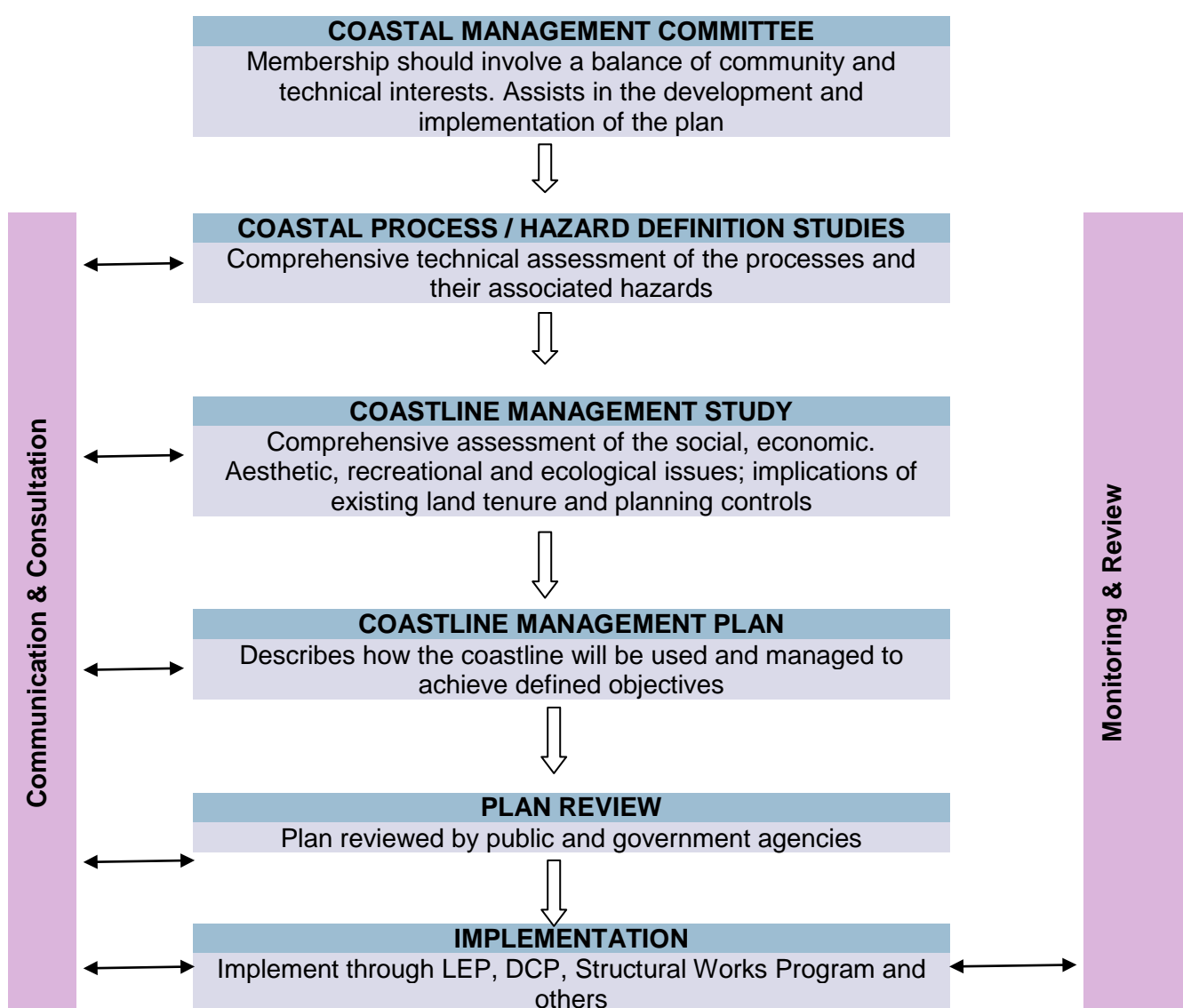
1.3 PLANNING FRAMEWORK & PURPOSE OF PLAN

The Office of Environment & Heritage (OEH) within the Department of Premier & Cabinet works closely with local councils, catchment management authorities and communities across the state to ensure the long-term protection, conservation and restoration of coastal, estuarine and floodplain environments.

The OEH's Coastal Management Program aims to identify and manage the risks from coastal hazards, including predicted sea level rise. This program provides funding support and technical advice to assist councils to prepare coastline management plans and associated studies. In 2011–12, OEH offered \$0.614 million in grants to 12 councils for 16 projects under this program (OEH 2011).

The OEH provides strategic guidance (**Figure 1.3**) for the development of Coastal Zone Management Plans in NSW, through its 'Coastline Management Manual'².

Figure 1.3 Elements of the Coastline Management System



² The new 'Guidelines for Preparing Coastal Zone Management Plan' was gazetted on 31 December 2010. These Guidelines replaces Coastline Management Manual (NSW Government 1990) and Estuary Management Manual (NSW Government 1992). Preparation of Manly Cove CZMP started in 2005 and hence, continued to use processes described in Coastline Management Manual.



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1.3.1 Manly Harbour Foreshores & Coastline Management Committee

The Manly Harbour Foreshores & Coastline Management Committee, under the stewardship of Manly Council was established in early 2009 to guide the preparation of a number of plans including the Manly Cove Coastal Zone Management Plan (CZMP).

The Committee has representations from Manly Council, Community Precincts, State Government Agencies and community. The relevant government departments include:

- Office of Environment & Heritage (OEH);
- NSW Maritime; and
- Department of Primary Industries NSW (DPI).

The first meeting of the Committee was held on 14 April 2009. The Committee meets on a bi-monthly basis.

In order to support the Committee and to obtain expert contribution in the CZMP, an internal 'Coastal Focus group' consisting of 20 key staff members from a range of fields was also formed (details on page 2). The Group was extensively consulted throughout the CZMP development process.

1.3.2 Community Consultation

A vital part in the coastline management planning process is community involvement and action. Hence, an extensive promotional and consultation campaign was undertaken through the development of the Manly Cove Coastal Zone Management Plan.

Advertisements: Advertisements were placed within in the Manly Daily to seek community submissions on 8 October 2005 and temporary display set up in the library foyer explaining the CZMP process and encouraging community feedback.

Webpage: A webpage, created on Manly Council's website (<http://www.manly.nsw.gov.au/Manly-Cove.html>) allowed easy access to information relevant to the plan.

Precinct Newsletters: Articles were regularly sent to Precincts for inclusion in monthly newsletters.

Survey: Structured survey forms were prepared and distributed to obtain community responses on importance, key issues and specific suggestions for inclusion in the Coastal Zone Management Plan. The survey forms were distributed through various means, and also emailed or posted to people upon request. A total of 89 survey forms were returned. Among them, 79 were from Manly residents who visit the Manly Cove area regularly.

Field Days: Two separate opportunities were utilised for consultation including:

- Hill to Harbour Community Walk Tania Park to Manly Cove (3 September 2005), and;
- 'Boats and Beasties' Marine Environment Workshop East Esplanade (17 September 2005)

1.3.3 Coastline Hazard Definition Study

External consulting engineers Patterson Britton & Partners (2004) were commissioned by Council to complete a Coastline Hazard Definition Study for all foreshore areas within the section of shoreline from the Davis Marina to Manly Point including North Harbour Reserve, Fairlight Beach, Delwood Beach and Manly Cove. This study provides an in-depth understanding of the coastal processes and their associated hazards.

The report includes assessment of beach erosion, shoreline recession, sand drift, coastal inundation, stormwater erosion, slope and cliff instability, climate change and determines the stability of the existing

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seawalls. This study identifies specific hazards threatening the area and quantified these by applying a risk management approach which determined the level of risk based upon the likelihood and consequence of it occurring.

1.3.4 Coastline Management Study

The Coastline Management Study, completed in December 2009, builds upon the information provided in the Coastline Hazard Definition Study along with information sourced from available data and study results. The purpose of a coastline management study, according to the Coastline Management Manual (NSW 1990), is to identify options relevant to the environmental planning and management of the coastal area. In addition, the study should comprehensively assess the social, economic, aesthetic, recreational and ecological issues associated with land use along the coastline, including implications of existing land tenure and planning controls, the creation of new jobs, the preservation of areas of aesthetic or ecological significance, the protection or enhancement of recreational amenity, exploitation and management of tourism opportunities.

The Study has:

- identified the planning framework detailing institutional and policy environment;
- assessed land use, tenure and management;
- identified coastal processes and coastline hazards;
- assessed climate change impacts, ecological and socio-economic environment;
- recorded community perceptions
- developed and evaluated management goals and objectives; and
- developed and evaluated management options that will achieve the objectives.

1.3.5 Coastal Zone Management Plan

The Hazard Definition and Management studies provided the factual basis for the formulation of this Coastal Zone Management Plan (CZMP) considering information contributed during community and stakeholder consultation. The Plan has considered and incorporated feedback from the Harbour Foreshores & Coastline Management, Access and Manly Scenic Walkway Committees. The Harbour Foreshores & Coastline Management Committee contributed in prioritisation of management options.

The Outline and the First Draft

An outline of the CZMP was presented and discussed at the meeting of the Harbour Foreshores & Coastline Management Committee on 20 April 2010.

The first draft of the CZMP was circulated and discussed at the Harbour Foreshores & Coastline Management, Access and Manly Scenic Walkway Committees during June- July 2010. The first draft was circulated to members of the Council's internal 'Coastal Focus Group' on 18 June 2010 for critical review and feedback.

Review of the Final Draft

This Final Draft has been prepared based on the received feedback and contributions. The draft of the CZMP was again circulated and discussed at the Harbour Foreshores & Coastline Management, Access and Manly Scenic Walkway Committees during August-September 2010. The Harbour Foreshores & Coastline Management Committee, at its meeting dated 14 December 2010, endorsed the draft for presentation to P&S Committee to allow public exhibition.

Members of the Committee were requested to fill in 'Endorsement and Prioritisation Form' scrutinizing each management options individually. On the basis of received responses, all management options were modified and prioritised.

The final draft was again circulated to members of the Council's internal 'Coastal Focus Group' in May 2011 for critical review and feedback.

Public Exhibition: The Final draft of the Coastline Management Plan was placed on public exhibition from 20 June to 16 September 2011. The community was also invited to attend a community information day on 23 July 2011 to facilitate stakeholder and community input and comment on the CZMP.

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A total of five submissions were received.

The 'Harbour Foreshores & Coastline Management Committee', at its meeting on 11 October 2011, has reviewed all submissions, endorsed and recommended the Final Draft to Council for adoption.

Adoption and Implementation: This final Coastline Management Plan was presented to the Council for consideration. The report was formally adopted at the Council meeting on 7 November 2011.

1.3.6 Purpose of the Plan

In many ways, formulation of the plan is the most important part of the coastal zone management planning process because it translates the understanding developed in previous stages into practical actions directed squarely at improving the wellbeing of the coastline. It is clear from the simple aim specified in the Coastline Management Manual (NSW 1990) "...a coastline management plan describes how the coastline will be used and managed to achieve defined objectives. The primary objectives are to ensure compatibility with hazards, to reduce the impact of hazards on individual owners and occupiers, to reduce private and public losses from hazard damage, to protect and enhance the recreational amenity of beaches, and to ensure an appropriate long term balance in the utilisation and conservation of the coastline". A coastal zone management plan should have the knowledge and support of the whole community.

1.4 STATUS OF PLAN

Development of the Manly Cove Coastal Zone Management Plan (CZMP) has been undertaken in line with the NSW Coastal Policy 1997, ongoing advances in coastal management and amendments made in 2002 and 2010 to the *Coastal Protection Act 1979*. This is an integrated planning approach that incorporates the management of coastal hazards and risk with social economic, aesthetic, recreational and ecological factors.

The Manly Cove Coastal Zone Management Plan has been prepared under the NSW Government's Coastal Management Program, following its 'Coastline Management Manual'³. The Program is designed to fulfil the requirements of the NSW Coastal Policy 1997. However, as the Manly Cove study area comes under the purview of Sydney Harbour catchment, the most important guiding document is the Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 under the *Environmental Planning & Assessment Act 1979*.

Development of the Manly Cove Coastline Management Plan (CMP) fulfils a number of commitments provided in different documents. Key initiatives identified in Council's Manly Management Plan 2010-2013 (MC 2010) include:

- Coastline and Estuary Management Planning for Manly LGA complete; with finalisation of Manly Cove Coastline Management Plan and significant implementation underway.

It is action C1.3.1 (develop and implement comprehensive Coastline Management Plans (CMPs) for all areas of foreshore in Manly) of the Manly Sustainability Strategy 2006 (MC 2006). It supports strategy 'E2.1: Improve health of waterways, coasts and estuaries' of the draft North East Subregional Strategy (DoP 2007).

Development of the Manly Cove Coastal Zone Management Plan (CZMP) also complements an action under Sydney Metropolitan Catchment Management Action Plan to contribute to management target, MTECMC 2.5: By 2016 the Sydney Coastline is covered by a Coastline Management Plan.

³ This manual is now replaced by the new 'Guidelines for Preparing Coastal Zone Management Plan' which was gazetted on 31 December 2010. Preparation of Manly Cove CZMP started in 2005 and hence, continued to use processes described in Coastline Management Manual. This Plan has to be revised eventually to using the new Guidelines.

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1.5 STRATEGIC VISION

Setting the future vision is an important element in any planning process and ensures strategic long term thinking and avoids focus on daily issues.

Wider community participation in this vision development is not only important but crucial. Manly Council has, as a matter of process, for the last two decades, involved community in setting vision through programs like myManly, Futures Forum, Surfing the Future and recently through the Community Strategic Plan Beyond 2021 (MC 2011). The following vision statement has been adopted:

"Where natural environment and heritage sustain and complement a vibrant cosmopolitan and community lifestyle. In addition, we will work in partnership to deliver enhanced safety, cleanliness, accessibility, connectedness, and sustainability in Manly for current and future generations".

The Community Strategic Plan (MC 2011) also described community values for Manly, considered important during the next ten years to support the community vision for the future of Manly. The Manly area will benefit by working towards the following:

- *A sustainable environment and economy*
- *Affordable housing*
- *Accessible places*
- *Connected & involved local community that is culturally vibrant*
- *A clean environment*
- *Protecting its natural and built environment*
- *A place for both residents and visitors to enjoy*
- *Managing its population growth*
- *Well managed and accountable local government*
- *Clearly defined plans.*

The same vision statement and community values have been adopted in preparation of this Manly Cove Coastal Zone Management Planning process.

In addition, the State Plan, state-wide targets by the Natural Resources Commission and the vision of the Sydney Metropolitan Catchment Management Authority (SMCMA) have been considered.

1.6 KEY MANAGEMENT ISSUES & GOALS

A long list of management issues was identified through completed community survey forms and during two community consultation field days. These issues were presented and discussed at the Manly Harbour Foreshore Management Committee and are summarised under 10 key broad based management issues (with 2-letter code shown within bracket). These headings have been retained throughout this report. For each management issue, a goal has been set (**Table 1.6**).

Table 1.6: Key management issues and goals set

Key Management Issues	Goals
Aquatic/Intertidal Habitat Conservation & Management (AH)	1.0 Restore and maintain a healthy and diverse mix of aquatic and intertidal habitats that will maintain and improve biodiversity and ecological functions of Manly Cove.
Boating, Maritime Operations & facilities (BF)	2.0 To achieve the highest level of environmental protection and safety for maritime operations within Manly Cove.
Enhancement of Public Facilities, infrastructure & signage (PF)	3.0 Public facilities, infrastructure and signage are upgraded and maintained to facilitate improved social amenity.

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Key Management Issues	Goals
Water Quality (WQ)	4.0 To ensure water quality meets the community's expectations and falls within acceptable standards suitable for fishing and swimming
Terrestrial Ecosystem (TE)	5.0 To conserve and enhance the integrity and diversity of native terrestrial flora and fauna, and their ecosystems
Climate Change & Coastal Hazards (CH)	6.0 Assess, monitor and mitigate risks from coastline hazards and climate change
Waste Management (WM)	7.0 Promote and facilitate sustainable waste management in Manly Cove
Access & Traffic Management (AM)	8.0 To provide an environment at Manly Cove that is accessible to all people
Geodiversity (GD)	9.0 Conserve the significant geodiversity elements of the area's coastline
Heritage Conservation and Management (HC)	10.0 Ensure that all Aboriginal and European (cultural and natural) heritage areas in the study area are preserved and protected.

In general, set goals and objectives relate to the general goal of the NSW Coastal Policy 1997, *Coastal Protection Act 1979*, *Water Management Act 2000* and management principles described in relevant regional plans (Sydney Regional Environmental Plan – Sydney Harbour Catchment 2005, Draft Subregional Strategy: North East Subregion, July 2007, Sydney Metropolitan Catchment Management Action Plan 2008 and also Manly Local Environmental Plans and different strategy documents.

1.7 DURATION OF PLAN

The Coastline Management Plan is a strategic plan with a visionary long-term time frame of 15- 20 years with firmed up implementation program of 5 years. Though the plan is usually reviewed and revised every 5 years, it is expected that this Plan may be reviewed earlier to make it aligned with the newly released 'Guidelines for Preparing Coastal Zone Management Plan' (January 2011).

1.8 MANAGEMENT AGENCIES

Manly Council (MC) is the principal management agency of this plan. Council has for many years undertaken remedial and maintenance works to enhance the coastal environment. In recent years the emphasis has been on understanding the functioning of the coastal and estuary catchments as an integrated ecosystem. The completion of the coastline management study and preparation of coastline management plan are significant steps in the move towards holistic management.

The following agencies/organisations have been / will be involved in the implementation of the Manly Cove Coastal Zone Management Plan. Agencies have been identified against each management options:

- NSW Maritime;
- Department of Primary Industries (DPI);
- Office of Environment & Heritage (OEH)
- NSW Parks & Wildlife Services (NPWS – OEH)
- State Emergency Services (SES);
- Roads & Transport Authority (RTA)
- Sydney Water;
- Sydney Coastal Councils Group (SCCG); and
- Aboriginal Heritage Office (AHO).

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Further description of these agencies is presented in **Appendix A**.

1.9 RELATIONSHIP TO OTHER PLANS

This Coastal Zone Management Plan has evolved through incorporation of strategic directions from a number of Council's management documents and land use planning instruments (**Table 1.9a**), specially including Development Control Plan for Manly Cove. The adopted Coastal Zone Management Plan will eventually be mainstreamed in to these documents in order to embed coastline management as part of Council's core business.

Table 1.9a Outline of key Council documents with relationship to Manly Cove CZMP

Management Documents	Relationship to the document
Manly Community Strategic Plan Beyond 2021	<p>Manly Council is required under the <i>Local Government Act 1993</i> to establish and implement a Community Strategic Plan that engages the community via a strategy based on social justice principles and identifies the community's main priorities and aspirations for the future.</p> <p>Manly Community Strategic Plan Beyond 2021 represents the aspirations of the people who live, visit and work in the Manly area. It is a 10 year plus strategy that has been developed as a collaborative effort between the community and Council. The Plan defines a sustainable direction for the Manly LGA area and sets out strategic direction in achieving the needs of the community. It addresses a broad range of issues that are relevant to the whole community.</p> <p>Manly Community Strategic Plan Beyond 2021 is a three-part document consisting of:</p> <ul style="list-style-type: none"> Part 1 Community Strategic Plan Part 2 Resourcing Strategy and Part 3 Four Year Delivery Program 2011-2015 and One Year Operational Plan 2011-2012. <p>'Preserving Manly's natural heritage and beaches' is one of the four most important priorities emerged from the community engagement for the next 10 years. This strategic direction is translated into the following goals:</p> <p>A sustainable, protected and well managed natural and built Manly by</p> <ul style="list-style-type: none"> • Natural heritage, bushlands and biodiversity is protected and preserved for future generations • Create liveable neighbourhoods and more affordable housing choices by better managing population growth • Reduced green house gas emissions in the manly area • A clean Manly with zero waste <p>The Goal 'Natural heritage, bushlands and biodiversity is protected and preserved for future generations' is again translated into three strategies:</p> <ul style="list-style-type: none"> • Promoting the protection of the environment as the key to a sustainable future • Delivery and enhance environmental regulation services to protect natural environment • Undertake projects in partnership with community stakeholders that protect, preserve and manage Manly's bushlands, biodiversity, geodiversity, coastal, estuary and water-cycles to benefit future generations.

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Management Documents	Relationship to the document
<p>Manly Council Delivery Program 2011-2015 & Operational Plan 2011-12</p>	<p>These Program and Plan addresses the full range of Council's operations and provides actions or projects with performance indicators to measure progress. Each action or project is undertaken with a view to contributing towards achieving a strategic direction and outcome that was seen as important to the community in the Community Strategic Plan. The Progress on these actions is reported to the Council on a quarterly basis and to the community through the annual report.</p> <p>The following actions/projects, related to coastal zone program, are planned under the Delivery Program 2011-2015:</p> <ul style="list-style-type: none"> • <i>Implementation of adopted Coastline & Estuary Management Plans</i> • <i>Consolidation and revisions of existing Coastal & Estuary Management Plans into Coastal Zone Management Plans following recent NSW Government Guidelines</i> • <i>Undertake measures for coastal protection and implement Emergency action plans</i> • <i>Aquatic Reserve Management Plan preparation and implementation</i> • <i>Landscape Masterplan for reserves in coastal foreshores</i> • <i>Assess and plan water access facilities and infrastructures</i> • <i>Establish and manage coastal erosion risk areas</i>
<p>Manly 2015</p>	<p>MANLY2015 is a strategic, forward thinking and sustainable Masterplan for the Manly CBD. The Masterplan aims to improve, renew and capitalise on Manly as a local town centre and international destination for our current and future community. The plan is essentially a vision for improvements to the public domain and streetscape as well as a reconfiguration of traffic – all with the aim to renew the Manly town centre for the coming decades with long-term infrastructure benefits for the local environment, economy and community.</p> <p>Manly2015:</p> <ul style="list-style-type: none"> ▪ Brings our laneways and streets surrounding The Corso back to life; ▪ Is pedestrian and bicycle friendly; ▪ Incorporates sustainable, energy efficient buildings and streetscape design; ▪ Makes shopping and socialising more enjoyable for locals and visitors; ▪ Is laid out so cars don't rule the environment – yet parking is easy! ▪ Enhances the character and heritage of Manly; ▪ Creates a sense of the Ocean Beach Promenade merging seamlessly with Manly's built form and heritage; ▪ Encourages an atmosphere where business and the local community aspirations thrive harmoniously together.
<p>Manly Sustainability Strategy 2006</p>	<p>In December 2006 the <i>Manly Sustainability Strategy – For Today and Future Generations</i> http://www.manly.nsw.gov.au/Sustainability-Strategy.html was adopted. The Strategy recognises that for the Manly community to be an enjoyable and liveable community in the future it is important for Council to address social, economic and environmental issues. Council's success in implementing the Strategy is reported annually within Council's Annual Plan.</p> <p>It is a 10 year strategy and addresses the vision through the six principles and 10 broad programs. The Manly Cove Coastal Zone Management Plan (CZMP) contributes to the MSS program: Coastline and Estuary Management Program to achieve the principle C: A Natural and Sustainable Manly'. The objective of the</p>

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Management Documents	Relationship to the document																																		
	<p>Coastline and Estuary Management Program is to manage the terrestrial and marine environment interface to balance environmental conservation and the enjoyment of the area by user groups and ensure that Manly's coastlines are recognised for their important natural and cultural heritage.</p> <p>Preparation of this CZMP relates to Action C1.3.1 of Manly Sustainability Strategy 2006. Further, this CZMP addresses following actions of Manly Sustainability Strategy:</p> <table border="1"> <tr> <td>B1.4.2 (walking trails in open space)</td><td>C1.3.8 (incorporate CC information)</td></tr> <tr> <td>B1.4.4 (access to all recreational facilities)</td><td>C1.3.10 (monitor identified coastal hazards)</td></tr> <tr> <td>C1.1.6 (water quality monitoring)</td><td>C1.3.11 (interpretive signage)</td></tr> <tr> <td>C1.2.1 (map aquatic flora & fauna)</td><td>C1.3.12 (participate with SCCG)</td></tr> <tr> <td>C1.2.3 (Review CMPs)</td><td>C1.3.13 (work closely with SMCMA)</td></tr> <tr> <td>C1.2.6 (Involvement of local residents)</td><td>C1.3.16 (promote community involvement)</td></tr> <tr> <td>C1.2.8 (conserve marine resources)</td><td>C1.3.18 (cyclic evaluation of CMPs)</td></tr> <tr> <td>C1.2.10 (control of <i>Caulerpa taxifolia</i>)</td><td>C1.4.1 (map geodiversity element)</td></tr> <tr> <td>C1.2.12 (police breaches of bag limits)</td><td>C1.4.3 (geodiversity conservation strategy)</td></tr> <tr> <td>C1.2.14 (extend boundary of NH Aquatic Reserve)</td><td>C1.5.6 (Recommendations of Flora & Fauna Study)</td></tr> <tr> <td>C1.2.15 (no anchoring and eco-friendly mooring buoys)</td><td>C1.6.11 (Little Penguin monitoring)</td></tr> <tr> <td>C1.2.16 (seagrass friendly moorings)</td><td>C1.7.4 (linking habitat corridors)</td></tr> <tr> <td>C1.2.17 (enforce Penguin critical habitat)</td><td>C1.7.12 (protection of threatened species)</td></tr> <tr> <td>C1.3.2 (seawall stability)</td><td>C2.4.1 (risk management through CMPs)</td></tr> <tr> <td>C1.3.3 (hazard information)</td><td>C2.4.3 (understanding of natural hazards)</td></tr> <tr> <td>C1.3.5 (prioritised actions)</td><td>D2.2.5 (management plan for Aboriginal heritage)</td></tr> <tr> <td>C1.3.7 (beach nourishment)</td><td>D2.2.9 (Increased community awareness)</td></tr> </table> <p>Key priority and funded objectives and actions listed in the Sustainability Strategy are integrated into the actions of the Management Plan document and will continue to be addressed as part of the new Integrated Strategic Planning framework to commence in 2011. Integrated planning is the best method to imbed sustainable principles across all activities of Council.</p>	B1.4.2 (walking trails in open space)	C1.3.8 (incorporate CC information)	B1.4.4 (access to all recreational facilities)	C1.3.10 (monitor identified coastal hazards)	C1.1.6 (water quality monitoring)	C1.3.11 (interpretive signage)	C1.2.1 (map aquatic flora & fauna)	C1.3.12 (participate with SCCG)	C1.2.3 (Review CMPs)	C1.3.13 (work closely with SMCMA)	C1.2.6 (Involvement of local residents)	C1.3.16 (promote community involvement)	C1.2.8 (conserve marine resources)	C1.3.18 (cyclic evaluation of CMPs)	C1.2.10 (control of <i>Caulerpa taxifolia</i>)	C1.4.1 (map geodiversity element)	C1.2.12 (police breaches of bag limits)	C1.4.3 (geodiversity conservation strategy)	C1.2.14 (extend boundary of NH Aquatic Reserve)	C1.5.6 (Recommendations of Flora & Fauna Study)	C1.2.15 (no anchoring and eco-friendly mooring buoys)	C1.6.11 (Little Penguin monitoring)	C1.2.16 (seagrass friendly moorings)	C1.7.4 (linking habitat corridors)	C1.2.17 (enforce Penguin critical habitat)	C1.7.12 (protection of threatened species)	C1.3.2 (seawall stability)	C2.4.1 (risk management through CMPs)	C1.3.3 (hazard information)	C2.4.3 (understanding of natural hazards)	C1.3.5 (prioritised actions)	D2.2.5 (management plan for Aboriginal heritage)	C1.3.7 (beach nourishment)	D2.2.9 (Increased community awareness)
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Council Policies	Policies should be updated or where necessary, created to reflect Council's position on important coastal and catchment management issues. This makes the position explicit and more likely to be reflected in how the whole of Council operates.																																		
Coastal Zone Management Plans (CZMPs)	<p>The Manly Cove Management Plan considers issues and actions addressed in the following plans:</p> <ul style="list-style-type: none"> • Cabbage Tree Bay Management Plan • Forty Baskets Coastline Management Plan • Little Manly Coastline Management Plan • Manly Ocean Beach Coastline Management Plan • Clontarf/ Bantry Bay Estuary Management Plan • North Harbour Coastline Management Plan 																																		
Manly Local Environmental Plan 1988	The Manly Local Environment Plan (LEP) details the zoning of land within the Manly Council area.																																		

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Management Documents	Relationship to the document
(under revision)	<p>The LEP also identifies Items of Environmental Heritage, Environmentally Sensitive Areas, Foreshore Scenic Protection Areas and Potential Acid Sulphate Soils and provides planning controls for the on-going appropriate management of each of these items and areas.</p> <p>This LEP is now being reviewed and updated in accordance with the NSW Planning Reforms and amended Planning legislation.</p> <p>The adopted Coastal Zone Management Plan will eventually be mainstreamed in to the Manly LEP in order to embed coastline management as part of Council's core business.</p>
<p>Development Control Plans (DCP)</p> <p>(under revision)</p>	<p>DCP's are plans that control development activity in the Council. Engineering Guidelines for development and Water Sensitive Urban Design are both examples of Guidelines that have been turned into DCP's. Where robust management of development is required to protect the coastline, Council's Coastal Management Team should work with planners to revise/modify DCP's that aid the long-term management of the coastlines & foreshores.</p> <p>A separate DCP for Manly Cove was adopted by Council in 1996.</p>
<p>Manly Development Control Plans (DCP) for Manly Cove</p> <p>September 1996</p>	<p>This policy applies to land above and below high water mark between Commonwealth Parade, West Esplanade and East Esplanade and a line drawn from the south western end of East Esplanade Reserve to the southernmost point of Commonwealth Parade</p> <p>This policy applies to all land based and land/water interface development. Aims & Objectives of the Policy are:</p> <ol style="list-style-type: none"> 1. To provide detailed controls for the guidance of developers in order to achieve the aims, objectives, etc of Sydney Regional Environmental Plan No. 23 in relation to development in Manly Cove. 2. To preserve and enhance the amenity of Manly Cove including public places and areas visible from public places or from the navigable waters of Sydney and North Harbours. 3. To provide for maximum public visual and scenic quality to the harbour front and to avoid as much as possible private, exclusive use. 4. To provide and enhance efficient transport facilities while recognising that the wharf and its connection to The Corso act as a gateway to Manly so that all development must be of a high visual quality and have regard to its visual impact on the shoreline and adjacent reserves. 5. To ensure that all development in Manly Cove is complementary to and does not detract from the shoreline and adjacent reserves in Manly Cove. 6. To retain all of the existing beach frontage for aquatic and recreational activities. 7. To make optimum use of the Manly Pavilion precinct while still retaining its existing character. 8. To retain the existing character of the boat club precinct at the south western end of Manly Cove while seeking to increase public usage. 9. To conserve and enhance the environmental heritage of Manly Cove and its foreshores.
Plans of Management	Individual plans of management are very useful for describing Council's vision for managing public land. These are used to manage significant catchment habitats,

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Management Documents	Relationship to the document
	recreation on the estuary and general foreshore management. This Manly Cove Coastal Zone Management Plan has been developed to address all requirements for community land management under the <i>NSW Local Government Act 1993</i> and <i>NSW Crown Lands Act 1989</i> and acts as a Plan of Management for community lands of the study area.
Climate Change Risk Assessment and Adaptation Action Plan	Council has completed a "Manly LGA Climate Change Risk and Adaptation Action Plan" Project under the Commonwealth Department of Climate Change and Energy Efficiency's Local Adaptation Pathways Program (LAPP). Council is building on the outcomes of this project in order to develop a more comprehensive Adaptation Action Plan for Manly LGA which will provide a strategic approach to climate change risk management and adaptation for Manly Council and the community. It will incorporate elements of the Cardno (2008) report titled ' <i>Climate Change Actions for Manly LGA 2008 > 2038</i> ' and also build upon knowledge and outcomes of the Sydney Coastal Council Group's ' <i>Systems Approach to Regional Climate Change Adaptation Strategies in Metropolises</i> ' (2008). Statewide Mutual has been engaged to assist with this process.
Carbon Emissions Reduction Plan (being prepared)	Council has commenced a Carbon Emissions Reduction Project to meet Council's target of 25% emission reduction from the 2008/09 level by 2020. Council is determined to achieve further reductions if possible. This involves calculation of Council's carbon footprint (independently verified), development of a Corporate Carbon Reduction Strategy and Action Plan which identifies measures/actions in order for Council to meet its emissions reduction target and the development of a carbon management tool to monitor, track and report on progress towards the emissions target. Council is also undertaking a similar community component in consultation with the community involves calculation of the community carbon footprint, development of a Manly Community Carbon Reduction Strategy and Action Plan and community carbon management tool. The Corporate and Community Carbon Reduction Strategy and Action Plans will replace the 2001 Manly Local Air Quality and Greenhouse Action Plan and Council's previous mitigation response through the Cities for Climate Protection Plus Program.

This Coastal Zone Management Plan has evolved through incorporation of strategic directions from a number of documents of external stakeholders (**Table 1.9b**). Consideration should be given to linking these documents to ensure that coastline management responsibilities are carried through to their core business as well.

Table 1.9b Outline of key external documents with relationship to Manly Cove CZMP

Management Documents	Relationship to the document
Sydney Metropolitan Catchment Action Plan	<p>The Sydney Metropolitan CMA works to implement its Catchment Action Plan (CAP) which is a strategic planning tool that identifies the key natural resource features the Sydney community wants to protect and improve. The CAP outlines specific targets to be achieved to 2016. The CAP reflects the needs of the region and a wide array of partners will help deliver these targets.</p> <p>The plan applies to a catchment area of 1860 square sq. km. (the area extends offshore to include state waters to the three nautical mile limit) accommodating 39 Local Government Areas including Manly. The catchment is divided into eight sub-catchments. The study area belongs to sub-catchment 'Middle Harbour'. Activities of catchment management relates to four themes including 'Water & Coast'.</p>

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Management Documents	Relationship to the document
	<p>The catchment target for the 'Water & Coast' sub-theme, among others, is</p> <p><i>'By 2016, there is improvement in the condition of coastal and marine ecosystems'.</i></p> <p>This target has further been translated into management targets as:</p> <ul style="list-style-type: none"> • MTECM2.1: By 2016 all vegetation in dune areas on public land is rehabilitated to reduce weed cover by 20% from June 2007 baseline. • MTECMC 2.2: By 2016 institutional and technical processes are in place to achieve environmentally sustainable management of beach environs. • MTECMC 2.3: By 2016 active management will protect or improve key estuarine and marine habitat areas in partnership with relevant authorities and user groups. • MTECMC 2.4: By 2016 there is an increase in the extent of Marine Protected areas. • MTECMC 2.5: By 2016, the Sydney coastline is covered by a Coastline Management Plan.
<p>Sydney Regional Environmental Plan - Sydney Harbour Catchments 2005: the Harbour REP</p>	<p>The Harbour REP covers the entire area of Sydney Harbour including Manly Cove. This is the most important planning document relevant for the Manly Cove CZMP study area. It establishes planning principles for land within the Foreshores and Waterways Area as follows:</p> <p>(a) development should protect, maintain and enhance the natural assets and unique environmental qualities of Sydney Harbour and its islands and foreshores,</p> <p>(b) public access to and along the foreshore should be increased, maintained and improved, while minimising its impact on watercourses, wetlands, riparian lands and remnant vegetation,</p> <p>(c) access to and from the waterways should be increased, maintained and improved for public recreational purposes (such as swimming, fishing and boating), while minimising its impact on watercourses, wetlands, riparian lands and remnant vegetation,</p> <p>(d) development along the foreshore and waterways should maintain, protect and enhance the unique visual qualities of Sydney Harbour and its islands and foreshores,</p> <p>(e) adequate provision should be made for the retention of foreshore land to meet existing and future demand for working harbour uses,</p> <p>(f) public access along foreshore land should be provided on land used for industrial or commercial maritime purposes where such access does not interfere with the use of the land for those purposes,</p> <p>(g) the use of foreshore land adjacent to land used for industrial or commercial maritime purposes should be compatible with those purposes,</p> <p>(h) water-based public transport (such as ferries) should be encouraged to link with land-based public transport (such as buses and trains) at appropriate public spaces along the waterfront,</p> <p>(i) the provision and use of public boating facilities along the waterfront should be encouraged.</p> <p>The study area is located totally in W2 (Environment Protection) zone, one of the nine zones covered in Harbour REP.</p> <p>The objectives of this zone are as follows:</p>

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Management Documents	Relationship to the document
	<p>(a) to protect the natural and cultural values of waters in this zone,</p> <p>(b) to prevent damage or the possibility of longer term detrimental impacts to the natural and cultural values of waters in this zone and adjoining foreshores,</p> <p>(c) to give preference to enhancing and rehabilitating the natural and cultural values of waters in this zone and adjoining foreshores,</p> <p>(d) to provide for the long-term management of the natural and cultural values of waters in this zone and adjoining foreshores.</p>
<p>Sydney Harbour Foreshores and Waterways Area – Development Control Plan 2005</p>	<p>This document compliments the Harbour Regional Environmental Plan. The DCP provides detailed design guidelines for development and criteria for natural resource protection for the locations identified as Foreshores and Waterways Area.</p> <p>In this DCP, different landscape character types in and around Sydney Harbour are recognised. These landscape character types provide a statement of character and intent and sets out performance criteria that are to meet for development within each landscape character types. Landscape character type 8 exists in Manly Cove CZMP study area.</p> <p>Further, and as part of the DCP of this Harbour REP, Office of Environment & Heritage (OEHL) has mapped Ecological Communities and Landscape Characteristics. Within the foreshores and waterways area boundary a number of aquatic and terrestrial ecological communities have been identified within Manly Cove CZMP study area including seagrass beds, mixed rocky intertidal and sand, urban development with scattered trees, grass bed and sandy beaches.</p>
<p>Metropolitan Plan for Sydney 2036</p> <p>December 2010</p>	<p>The Metropolitan Plan is an integrated, long-term planning framework that will sustainably manage Sydney's growth to 2036 while enhancing Sydney's unique lifestyle and environment. It builds on the 2005 Metropolitan Strategy's 'city of cities' approach and will transform Sydney from a single centred city to a more connected city with many centres and improved accessibility.</p> <p>The Plan recognises a number of challenges facing Sydney: a growing population, a changing population, more suitable and affordable housing, more jobs closer to home, more efficient transport, more efficient infrastructure delivery, a more sustainable Sydney, tackling climate change and maintaining our global competitiveness.</p> <p>The Metropolitan Plan will address the challenges facing Sydney through an integrated, long-term planning framework based on the strategic directions and key policy settings.</p> <p>The most relevant strategic direction and policy settings relevant to this Manly Cove CZMP is</p> <p><u>Tackling climate change and protecting Sydney's natural environment</u></p> <ul style="list-style-type: none"> • Reduce greenhouse gas emissions from the manufacturing and commercial sectors • Review the scope and stringency of BASIX • Prepare a climate change adaptation strategy for Sydney • Integrate environmental targets into land use and infrastructure decisions • Implement water, air and biodiversity plans for Sydney <p>The objective G4 of this Plan is 'to improve the health of waterways, coasts and estuaries' supported by action G4.3 'Promote coastal protection and foreshore</p>

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Management Documents	Relationship to the document
Draft Subregional Strategy: North East Subregion, July 2007	<p>access through implementation of relevant policies and guidelines’.</p> <p>More detailed planning follows via regional strategies and subregional strategies. There will be 10 sub-regional plans. The LGAs of Manly, Pittwater and Warringah Councils constitute the North East Sub-region. Sub-regional strategies remain a key planning tool for Sydney councils to help implement the Metropolitan Plan.</p> <p>The North East Subregion is well known for its natural environment including coastline, waterways and national parks. Growing sustainability requires managing the environmental impact of development and reducing consumption of natural resources as well as safeguarding assets from natural hazards, which are expected to increase over time with climate change. The strategy includes, among others, actions to: improve the health of waterways, coasts and estuaries; protect the loss of biodiversity; conserve and manage Aboriginal and other cultural heritage; and respond to the risk of climate change and sea level rise.</p> <p>The draft Strategy was exhibited between 17 July to 18 September 2007. Submissions were received from a range of stakeholders including the community, Government agencies, development industry and local Councils. These submissions are currently being reviewed and the draft North East Subregional Strategy is now being finalised, following the release of the Metropolitan Plan for Sydney 2036.</p> <p>When finalised, the draft North East Subregional Strategy will continue to guide land-use planning until 2036 in the Manly, Pittwater and Warringah local government areas.</p>
SHOROC’s regional Strategy: <i>Shaping Our Future</i> September 2010	<p>Adopted in September 2010, the <i>Shaping Our Future</i> strategy has been developed by Manly, Mosman, Pittwater and Warringah Councils. The strategy calls for investment from the state and commonwealth government to fix transport and health systems and enable councils to ensure growth is sustainable in the region.</p> <p>Climate change and its predicted impacts on sea levels, coastal erosion and weather patterns and resultant displacement of housing and other coastal and low lying land and impacts on bushland is identified as one of the key challenges of the region.</p> <p>Based on ‘<i>Shaping Our Future</i>’, SHOROC is now developing Regional Sustainability Strategy. Once finalised, it is envisaged the strategy will focus on areas such as energy, climate change, transport, waste, water, biodiversity and skills and capacity building, with projects identifying areas where the councils can work together more effectively or efficiently on a regional basis to improve the sustainability of the region.</p>
Sharing Sydney Harbour Access Plan, August 2003	<p>The Access Plan has been jointly prepared by the NSW Department of Planning and the NSW Maritime. An integrated approach has been taken by looking at both land and water access issues. A catchment-wide network of access ways will link metropolitan parklands with urban waterfronts and connect to water access points. Improved boating facilities will provide better public access for recreational craft such as dinghies, canoes, kayaks and sailing boats.</p> <p>The Access Plan identifies opportunities to improve access to the foreshores and</p>

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Management Documents	Relationship to the document
	<p>waterways for a range of recreational users including pedestrians, cyclists and recreational boaters.</p> <p>The Access Plan identifies strategic projects that may be developed in the longer term, i.e. over the next 20 years. Implementation of the Access Plan is assisted via the Sharing Sydney Harbour Access Program.</p> <p>The Program has been extended to provide \$6.75 million until 2013. Each year up to \$1.35 million is distributed on a dollar-for-dollar basis for specific capital works projects such as walking tracks, cycle paths, new public waterfront parks, jetties, pontoons and boat launching facilities. With matching funds from applicants, the program is expected to lead to at least \$30 million worth of access improvements.</p>
Sydney Regional Coastal Management Strategy 2010-2014	<p>This strategy was prepared by the Sydney Coastal Councils Group, represented by 15 Local Councils including Manly, to coordinate and integrate relevant coastal planning and management activities, and the responsible organisations, to improve coastal management in Sydney. This strategy applies to the coastal areas between Pittwater and Sutherland local government areas, including all areas that were previously excluded from the NSW Coastal Zone.</p> <p>The purpose of the Sydney Coastal Councils Group Strategic Plan is to guide integrated coastal zone management in the coastal and estuarine environments of Sydney. The Strategic Plan provides the SCCG and its Member Councils with principles and an action plan to apply in all their coastal management activities.</p>
The Northern Sydney Aboriginal Social Plan (NSASP) 2007-2011	<p>The Northern Sydney Aboriginal Social Plan is a document compiled by ten Councils in Northern Sydney Region, including Manly, to address the needs of Aboriginal and Torres Strait Islander people in the area. The aims of the Social Plan are to:</p> <ul style="list-style-type: none"> • Improve outcomes for the Aboriginal community living in Northern Sydney • Improve coordination and relationships with government on Aboriginal issues • Increase sharing and co-operation between individuals, groups, and agencies across Northern Sydney <p>The NSASP identifies 6 key areas of need; collaboration and cooperation, health and wellbeing, education and training, housing, employment and culture and heritage. The first Aboriginal Social Plan (a five year plan) was adopted in 2000.</p>
The NSW Sea Level Rise Policy Statement (November 2009)	<p>This policy statement outlines the Government's objectives and commitments in regards to sea level rise adaptation. It outlines the support that the Government will provide to coastal communities and local councils to prepare and adapt to rising sea levels.</p> <p>The NSW Government has adopted sea level rise planning benchmarks: an increase above 1990 mean sea levels of 40cm by 2050 and 90cm by 2100. The primary purpose of the benchmarks is to provide guidance supporting consistent considerations of sea level rise impacts, within applicable decision-making frameworks. This includes strategic planning and development assessment under the EP&A Act and infrastructure planning and renewal.</p> <p>The use of the benchmarks is required when undertaking coastal and flood hazard assessments in accordance with the Coastline Management and Floodplain Development Manuals. It is already a statutory requirement that the preparation of</p>

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Management Documents	Relationship to the document
	<p>Local Environmental Plans gives effect to and be consistent with these manuals.</p> <p>The sea level rise planning benchmarks can be used for purposes such as:</p> <ul style="list-style-type: none"> • incorporating the projected impacts of sea level rise on predicted flood risks and coastal hazards • designing and upgrading of public and private assets in low-lying coastal areas where appropriate, taking into account the design life of the asset and the projected sea level rise over this period • assessing the influence of sea level rise on new development • considering the impact of sea level rise on coastal and estuarine habitats (such as salt marshes) and identifying valuable habitats at most risk from sea level rise • assessing the impact of changed salinity levels in estuaries, including implications for access to fresh water.
<p>NSW Coastal Planning Guideline – Adapting to Sea Level Rise</p> <p>August 2010</p>	<p>The Guideline adopts the sea level rise planning benchmarks in the NSW Sea Level Rise Policy Statement. The Sea Level Rise Policy Statement identifies sea level rise projections of up to 40 cm to 2050, and 90 cm to 2100, for the NSW coastline.</p> <p>The Guideline outlines an approach to assist councils, State agencies, planners and development proponents when addressing sea level rise in land-use planning and development assessment</p> <p>It applies to all coastal areas of NSW, including the NSW Coastal Zone, as well as Sydney Harbour and Botany Bay. The term ‘coastal areas’ is used broadly to include the coastline, beaches, coastal lakes, estuaries, as well as the tidal reaches of coastal rivers. It also includes other low-lying land surrounding these areas that may be subject to coastal processes in the future as a consequence of sea level rise.</p> <p>The Guideline adopts the following six coastal planning principles for sea level rise adaptation:</p> <ol style="list-style-type: none"> 1. Assess and evaluate coastal risks taking into account the NSW sea level rise planning benchmarks. 2. Advise the public of coastal risks to ensure that informed land use planning and development decision-making can occur. 3. Avoid intensifying land use in coastal risk areas through appropriate strategic and land-use planning. 4. Consider options to reduce land use intensity in coastal risk areas where feasible. 5. Minimise the exposure to coastal risks from proposed development in coastal areas. 6. Implement appropriate management responses and adaptation strategies, with consideration for the environmental, social and economic impacts of each option. <p>This Guideline is structured around the implementation of the above six coastal planning principles for the consideration of sea level rise and has three key sections:</p> <p>SECTION 2 – IDENTIFYING COASTAL RISK AREAS outlines how sea level rise should be incorporated into coastal risk assessment.</p> <p>SECTION 3 – STRATEGIC AND STATUTORY LAND USE PLANNING provides information on how sea level rise impacts can be factored into strategic and</p>

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	<p>statutory land use planning.</p> <p>SECTION 4 – DEVELOPMENT ASSESSMENT outlines the process for considering sea level rise in the preparation and assessment of development applications in coastal areas.</p> <p>To support the Guidelines, NSW Government has released the following documents:</p> <ul style="list-style-type: none"> • <i>Coastal Risk Management Guide: Incorporating sea level rise benchmarks in coastal risk assessments</i> • <i>Flood Risk Management Guide: Incorporating sea level rise benchmarks in flood risk assessments</i>
<p><i>The Coastal Protection and Other Legislation Amendment Act 2010</i></p> <p>Commenced January 2011</p> <p>1</p>	<p>The <i>Coastal Protection Act 1979</i> is the principal legislation relating to coastal management in New South Wales. Key provisions of the Act include requirements relating to Ministerial concurrences for certain developments in the coastal zone, and requirements relating to preparing coastal zone management plans. It also includes order powers relating to unlawful dumping of material on beaches.</p> <p>In 2010 the Act was amended by the Coastal Protection and Other Legislation Amendment Act 2010. Amendments to the <i>Coastal Protection Act</i> commenced on 1 January 2011. These amendments and related amendments to the <i>Local Government Act 1993</i>:</p> <ul style="list-style-type: none"> ▪ allow landowners in specific locations to place sand or sandbags on the beach under strict conditions as emergency coastal protection works to reduce the impact of coastal erosion on their property. If the bags cause erosion they are to be removed; ▪ require consent authorities assessing development applications for long-term coastal protection works, such as seawalls, to be satisfied that appropriate arrangements are in place to restore beaches if they are eroded by the works; ▪ allow local councils to levy a coastal protection service charge on land where the current or past landowners have voluntarily constructed coastal protection works. This charge covers council costs for maintaining the works and restoring the beach if the works cause erosion; ▪ establish a NSW Coastal Panel to provide expert advice to the Minister and councils on coastal management issues. Under related amendments to the Infrastructure State Environmental Planning Policy (SEPP), the Panel is the consent authority for long-term coastal protection works where the council does not have a coastal zone management plan in place; ▪ improve the arrangements for coastal zone management planning, including coastal climate change adaptation; ▪ strengthen the powers of authorised officers and order powers relating to illegal dumping on beaches, and increasing penalties; and ▪ enhance the statutory exemptions from liability for councils and State agencies when their coastal management activities are carried out in good faith. <p>The amendments to these Acts are supported by a series of statutory and non-statutory guidelines</p>
<p>Guidelines for preparing Coastal</p>	<p>These statutory Minister's guidelines specify the requirements for councils preparing coastal zone management plans under the Coastal Protection Act. This is a</p>

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Management Documents	Relationship to the document
<p>Zone Management Plans</p> <p>December 2010</p>	<p>framework document which also includes key strategic considerations for preparing these plans. It also provides guidance on preparing coastal erosion emergency action subplans. These guidelines replace the 1990 Coastline Management Manual and the 1992 draft Estuary Management manual. The Minister for Climate Change and the Environment notified his adoption of these guidelines for the purposes of the Coastal Protection Act 1979 in the Government Gazette on 31 December 2010. The guidelines will be supported by a series of coastal management guide notes, which will provide further detailed information to support preparation of coastal zone management plans.</p>
<p>Coastal Protection Regulation 2011</p> <p>3 March 2011</p>	<p>The primary objective of the Coastal Protection Regulation 2011 which commenced on 3 March 2011 is to support the amendments to the <i>Coastal Protection Act</i>. The main provisions of the Regulation are:</p> <ul style="list-style-type: none"> ▪ requirements relating to emergency coastal protection works by landowners, specified in a Code of Practice under the Regulation and also explained in a guide to these requirements ▪ requirements relating to Ministerial concurrences which must be obtained before carrying out certain off-shore development activities, similar to the requirements in the Coastal Protection Regulation 2004 ▪ defining the arrangements for categorising land according to its vulnerability to coastal hazards, based on information in council coastal zone management plans. ▪ The Regulation requires that Ministerial concurrences under Part 3 of the Coastal Protection Act are required for certain offshore developments. These requirements do not apply to developments: <ul style="list-style-type: none"> ▪ under Part 3A and Part 4 of the Environmental Planning and Assessment Act 1979 or exempt development under that Act ▪ carried out in accordance with a coastal zone management plan. <p>Ministerial concurrences apply to that part of the coastal zone below the mean high water mark, excluding any estuary, lake or artificial harbour. For the purposes of the Regulation, 'estuary' includes any part of a river where the water level is affected (including intermittently) by coastal tides as well as any partially enclosed body of water that is intermittently open to the sea.</p> <p>To ensure that concurrence is only required where there is a potential for the development to present a high risk to the coastal zone, the concurrence of the Minister is not required if the development consists of, or the use and occupation of land is for the purpose of, any of the following:</p> <ul style="list-style-type: none"> ▪ the dredging of sediments from the seabed, when the dredging occurs in water depths greater than 30 metres below mean sea level and the volume of sediments removed is less than 100 cubic metres per year ▪ the placement of sediment on the seabed where the water depth following the placement would be greater than 30 metres below mean sea level and the volume of sediments placed is less than 10,000 cubic metres per year ▪ the placement of any solid object on the seabed where the top of the object, when placed, would be at a depth of more than 30 metres below mean sea level ▪ the temporary disturbance of the seabed associated with the carrying out the temporary disturbance of the seabed associated with the carrying out of development under the seabed is less than 30 days at any location.

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In addition, NSW Maritime did develop Framework Plans for both Manly Cove East (September 2005) and Manly Cove West. The Plans were not statutory but designed to present key information in a simple and graphic manner. These Framework Plans ceased to have effect from 3 August 2007.

1.10 SUPPORTING DOCUMENTS

Key supporting documents in relation to this Plan are:

- Manly Cove Coastline Management Study, Manly Council, October 2009
- Davis Marina to Manly Point Coastline Hazard Definition Study, Patterson, Britton & Partners, 2004
- Natural Environment Assessment and Recommendations for the Coastline Management Plan: Manly Cove, GIS Environmental Consultants, March 2004
- Foreshore Safety and Beach Rehabilitation Manly Cove East, May 2003
- East Manly Cove Beach Management Options: Scoping Study, June 2002

2. THE MANAGEMENT AREA

2.1 LOCATION & SETTING

The Manly Cove study area lies immediately to the north-west of the entrance to Sydney Harbour, bounded to the west by Federation Point and to the southeast by Manly Point and extends both seaward and landward from the shoreline between Federation Point and Manly Point (**Figure 1.2**). The study area covers 51 hectares and takes in the suburbs of Manly and Fairlight and also the local Precinct Community Forum areas of Fairlight, the Corso and Little Manly.

The study area includes Manly Cove West Beach and Manly Cove East Beach, the seawalls backing these beaches, sandstone cliff faces and wave cut intertidal platforms as well as a number of water based development including Manly Wharf and various boating facilities lining the eastern foreshore. The study area consists primarily of semi-natural, landscaped and built areas. It is characterized by natural and cut sandstone cliffs and escarpments with fringing native bushland pockets and landscaped areas along the Esplanade Reserves.

Manly Cove is a popular location for both visitors and locals alike. The Manly Scenic Walkway, a 10km scenic harbour walking track extending from the Spit Bridge to Manly, directs large numbers of walkers along the length of the study area. Manly Wharf also forms a vital transport link between the Northern Beaches and Sydney CBD.

North Harbour Aquatic Reserve lies very close to the study area. A new proposal to extend the North Harbour Aquatic Reserve to include the entire water side of the Manly Cove area is being considered by the Department of Primary Industries (DPI).

The entire study area is within the Sydney Harbour Foreshores and Waterways Area and Sydney Metropolitan Catchment Management Area.

Ownership and management responsibilities for the land and seabed within the study area are shared by a number of government agencies and Manly Council. In general, land of Manly Cove CZMP study area consists of private, crown, Manly Council, NSW Maritime, Sydney Water, Department of Primary Industries and NSW Land and Housing Corporation owned and administered land, with Crown Land representing by far the major public land holding. As the study area is located with the Sydney Harbour, NSW Maritime is responsible for the management of both seabed and waterways.

2.2 HISTORY

The study area has a rich history, beginning with extensive Aboriginal occupation, which is evidenced through the many middens that are still present. It is believed that two clans of the Guringai people; the Kay-e-my and the Cannalgal, occupied what is now part of the Manly Municipality Council. In particular the Cannalgal are believed to occupy their clan estate that is known in part as Manly Point. More recently, Metropolitan Local Aboriginal Land Council has recognised Bob Waterer as a traditional owner of Guringai country. The oldest Aboriginal site known in the Manly LGA is dated to about 4100 years before present. There are 5 recorded Aboriginal sites within the study area: burial site, open middens, shelter and rock engraving.

Following a rich history of Aboriginal occupation, Manly was visited and named by Captain Arthur Phillip and a small exploratory party between 21st and 23rd January, 1788 after they encountered a group of Aboriginal men. Phillip later reported "*their confidence and manly behaviour made me give the name of Manly to this place*".

Manly remained isolated for many years. Henry Gilbert Smith founded the village in 1853 after acquiring 100 acres of land. Soon a very small population grew which was able to eke out a living from fishing or farming. In June 1855, Smith wrote to his brother in England:

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"...the amusement I derive in making my improvements in Manly is, no doubt, the cause of my greater enjoyment, in fact I never feel a dull day while there. I should long ere this have been with you if it had not been for this hobby of mine, in thinking I am doing good in forming a village or watering place for the inhabitant of Sydney".

He purchased large tracts of land with the vision of Manly, with its splendid ocean beach and sheltered sandy coves, becoming 'the favourite resort of the Colonists'. In 1855 Smith built the first pier at Manly Cove and laid out his plans for the Manly Village. He built the first hotel opposite his pier, and lay out and cleared the route of the Corso, thus establishing a growth and recreation pattern for the area. **Table 2.2.1** provides a summary of historical events relevant to the Manly Cove study area post European settlement.

Table 2.2.1 - Summary of historic events within the Manly Cove study area 1788-2010.

Year	Event
1788	Manly visited by Captain Arthur Phillip and small exploratory party
1853	Henry Gilbert Smith buys John Thompson's 100 acres; Smith leases Katherine Darley's 130 acres
1855	Smith's <i>Ellensville</i> Plan drawn up; First Manly Wharf constructed; Pier Hotel constructed; Sunday ferry service begins; Corso Widened
1857	Brighton Baths bathing house constructed
1860	Brighton Temperance House (later known as Temperance Hotel), cnr Corso & East Esplanade; (Dec)
1868	Ferry wharf extended
1870	Manly Pavilion constructed
1877	Jan 6 – proclamation of Municipal District of Manly; Feb 13 – first Council elections May 27 – fire in West Esplanade leads to formation of Manly Fire Brigade
1879	Colonial Government grants £300 for tree planting; Nov - Foreshore reserves dedicated
1880	Men's Baths opened;
1881	July 1 - Port Jackson Steamship Co Ltd formed; October - Smallpox epidemic cases at Quarantine Station
1885	Women's Baths built; Corso Gas lamp;
1886	Aquarium on Corso opened 23 December
1902	July – Steamer <i>Manly</i> goes aground, all saved; William Gocher makes daylight swim (date uncertain);
1903	Feb – Steam tram to Manly Lagoon; 2 Nov – Council changes bathing by-law to permit all-day bathing; Manly wharf remodelled
1916	14 Oct – War Memorial, Corso, unveiled;
1924	Demolition of Pier Hotel
1930	13 June - Manly Art Gallery & Museum established
1931	Harbour Pool and boardwalk constructed, Manly Cove
1933	Opening of Manly Harbour Swimming Pool Pavilion
1939	Aug - Fire at Manly Wharf;
1942	Remodelling of Manly Wharf
1974	May - Severe storm damage results in demolition of Harbour baths; Ferry service becomes State-owned; Ferry <i>South Steyne</i> burnt out in a fire
1979	Corso pedestrianised
1988	Spit to Manly walkway opened;
1989	Redevelopment of Manly Wharf
1990	State owned JetCats enter service; Manly Wharf upgrade;
2005	Corso and Wharf 150 th Anniversary
2008	Corso Upgrade completed
2009	State owned JetCats ceased; Privately operated Fast Ferry service introduced
2010	Second privately operated Sydney Ferry started operation

2.3 NATURAL PROCESSES & ENVIRONMENT

2.3.1 Coastal Processes, Water Quality & Foreshore Structures

The study area is characterized by natural and cut sandstone cliffs and escarpments with fringing native bushland pockets and landscaped areas along the Esplanade Reserves. The study area has gradual rise to an altitude of 36m with a rapid rise between 20m to 26m.

Storms play an important role in determining the rate and magnitude of shoreline change. The most devastating storms to strike the NSW coastline since records began, in terms of erosion damage, is likely to be the May - June 1974 storms.

The wave climates at Manly Cove East and West beaches are composed of a combination of wind and boat generated waves and swell penetrating from the ocean. Manly Cove is generally fairly exposed to wind generated waves from the south-south west with the length of water measured at 6.5kms. Average annual wave height is established at 1m, 1.3m with 1 in 10 yr return period and 1.5m with 1 in 50 yr return period.

Boat wakes are generated by vessels sailing or steaming across the harbour and bay. The predominant vessel wave action experienced along the Manly Cove foreshore is considered to be derived from the Manly JetCats, recently replaced by privately operated, FastFerry and Sydney Ferry. At its closest point, the JetCats route is approximately 200m from the Manly Cove beaches. The vessel generated wave height would not be expected to exceed 0.8m. A 4 knot speed limit zone is in place north from Manly Point.

The wash created by vessels berthing and leaving the western side of Manly Wharf has been found to increase strain on the south-eastern portion of the netted swimming enclosure which has the potential to result in structural damage to this structure.

Water quality is crucial in overall coastal processes and to protect the health of the Manly Cove embayment. The total load of pollutants in stormwater, based on the modelling exercise undertaken for a normal rainfall year, is estimated to be approximately 750 kg/year of total Nitrogen; 100 kg/year of total Phosphorus; 50 kg/year of Copper, 70 kg/year of Lead, 150 kg/year of Zinc, and 41 tonnes/year of sediment. Roads and residential land-uses deliver the highest loads of almost all pollutants.

The Office of Environment and Heritage (OEH) under the Department of Premier & Cabinet (DPC) routinely measures the two major indicators of bacterial contamination in coastal water, *faecal coliforms* and *enterococci*, adjacent to the Manly Cove netted swimming enclosure. Faecal coliform levels complied with swimming guidelines 100% of the time over the years between 2003/04 and 2006-07. With the exception of one season, enterococci levels complied 100% of the time over the same period. There are 4 known sewer overflow locations and 2 sewage pumping stations within the study area.

The Department of Primary Industries (DPI) NSW has placed a ban on all commercial fishing within Sydney Harbour, stating the presence of elevated levels of dioxins in fish and crustaceans. Recreational fishing is still permitted, although dietary advice has been issued, stating that limits should be placed on the amount of Harbour caught fish that are consumed.

There are numerous foreshore structures within the study area including Manly Wharf development, the eastern boating precinct and a number of seawalls. The seawall along the back of Manly Cove West Beach, constructed around 1900, runs for approximately 230 m between Oceanworld to the west and Manly Wharf to the east. The seawall along the beach of Manly Cove East Beach, constructed during the late 1800's is approximately 270 m in length.

A number of boating facilities exist within a "Boat Club Precinct" located between the eastern end of Esplanade Reserve and Stuart Street including the Manly Yacht Club, Manly Rowing and Sailing Club, the Manly 16 Foot Skiff Club and the Manly Cove Launch Club.

Manly Cove is a popular boating area with 96 existing moorings, nine of which are for commercial use. All moorings in Manly Cove are positioned within 150 metres of the mean high water mark and are consequently

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located within important seagrass beds. Recently, a total of 30 seagrass friendly moorings have been installed replacing traditional moorings.

The newly renovated Manly Wharf, currently leased to private operators by NSW Maritime, encompasses a range of diverse uses providing waterfront restaurants, shopping and entertainment for the enjoyment of tourists and local day-trippers as well as Manly locals. However, this popularity has resulted in a range of management issues which must be addressed through collaboration between NSW Maritime, Wharf Management and Council.

2.3.2 Coastline Hazards

Beach erosion (or storm demand) is measured in terms of the volume of sand transported offshore and is usually expressed in terms of cubic metres per metre run of beach (m^3/m), as measured above Mean Sea Level (MSL) or Australian Height Datum (AHD). Beach erosion hazard value of $20 m^3/m$ and 20 to $30 m^3/m$ for a 100 year Average Recurrence Interval (ARI) storm event is considered reasonable for both Manly Cove East Beach and Manly Cove West Beach respectively.

Excluding the effects of sea level rise, the total loss of sand from Manly Cove West Beach between 1951 and 2001 was $5.4 m^3/m$. Therefore, a total volume of some $920 m^3$ of sand was eroded from Manly Cove West Beach over the 50 year period or about $0.11 m^3/m$ per year. If the average height of sand on the back beach is taken to be about 2.0 AHD (based on photogrammetric data) this would correspond to a landward shoreline movement of about 0.05 m/year (volume/(height x length x no. years)). In summary Manly Cove West Beach has undergone relatively minor longer term sand loss.

Manly Cove East Beach underwent accretion over the period 1974 to 2001. The total gain of sand on Manly Cove East Beach was $3.3 m^3/m$ between 1974 and 2001 or $1.9 m^3/m$ between 1986 and 2001 (based on profiles 1 to 10 total length of beach 180m). Therefore, there was a total sand volume gain of some $342 m^3$ between 1986 and 2001. This overall accretion can generally be accounted for by artificial beach nourishment that took place after in 1989, 1991 and 1992.

A review of hydrographic surveys dating back to 1895 suggests that the beach profile has not changed significantly over the past 100 years. For Manly Cove East Beach the predicted loss of beach width over the next 20 to 50 years due to sediment loss in severe storms and sea level rise is, conservatively, in the order of 5 to 10 metres. The current width of the beach, measured at mean sea level, is zero to approximately 15 metres.

At present, the hazard posed by drifting sand is not considered significant for Manly Cove Beaches due to the presence of seawalls which prevent the loss of any significant volumes of sand by aeolian processes.

Debris on the foreshore west of Manly Wharf following the 1974 storms showed that wave overtopping of the Manly Cove West seawall occurs in extreme events. The Manly Cove West seawall crest level varies between 3.4 and 3.7 AHD and is below the limit of wave run-up in severe storms

This overtopping in combination with scour effects at the toe of the seawall could potentially act to destabilise the seawall in an extreme event. Any raise to the seawall is, however, considered both impractical and undesirable from an aesthetic point of view. The potential for wave overtopping does need to be taken into consideration in the design of drainage systems behind the seawall.

During major stormwater runoff events, stormwater collected from back beach areas and discharging into coastal waters can cause significant erosion to the beach berm. There are three stormwater outlets which discharge through the seawall onto Manly Cove East Beach. These outlets scour channels through the beach sand as the stormwater flows across the beach into the harbour. In particular, the eastern two outlets currently create significant channels due to the high beach sand levels relative to the outlet level at this end of the beach.

The discharge velocities associated with these stormwater flows are insufficient to entrain and transport this sand-sized material any significant distance offshore. The delta formed by these sand deposits is redistributed along the beach by wave action and currents.

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During high intensity rainfall events, significant overland flows occur across the paved area between Manly Art Gallery and Oceanworld. Investigations highlight that the drainage system is under capacity in this location with the grate regularly blown open during high intensity rainfall events. This flow contributes to regular scouring of the beach sand to the far west of Manly Cove West beach.

A total of 17 sites with potential cliff and slope instability hazards have been identified. Remediation works at two sites have already been completed. The slope and cliff instability hazards relating to private properties may restrict future development of the site. The remediation of hazards identified on public land is the responsibility of Council who has gained external funding to conduct further geotechnical assessments as recommended within the original CHDS. Once completed the additional geotechnical assessments will enable Council to prioritise remediation based on the level of risk posed to both life and property by individual hazards.

2.3.3 Climate Change & Adaptations

Most of the Sydney region has a warm temperate climate. Average annual rainfall in greater Sydney is slightly less than 950 mm, ranging from more than 1200 mm near the coast to slightly less than 800 mm in the west. Rainfall throughout the region is greatest in summer and autumn, with a slightly higher proportion of winter rainfall on the coast than inland. Expected regional climatic changes to 2050 (DECCW 2010):

- Temperatures are virtually certain to rise in all seasons: The magnitude of projected increases ranges from 1.5–3°C.
- Rainfall is likely to increase in all seasons except winter: summer rainfall is likely to increase 20-50%, with smaller increases likely in autumn (non significant) and spring (10-20%). Winter rainfall is likely to decrease (10-20%).
- Increased evaporation is likely in spring and summer: Evaporation is likely to increase 10-20% in spring and summer. There is no clear pattern in projections for autumn and winter.
- The impact of the El Niño–Southern Oscillation is likely to become more extreme: Current scientific literature indicates that the pattern of climate variability associated with ENSO will continue under enhanced greenhouse conditions. This assessment assumes that ENSO years will continue to be drier than average but also become hotter, leading to more extreme impacts. La Niña years are likely to continue to be wetter than average but will also become warmer. In El Niño events, water stress is likely to be more intense because of higher temperatures.

The climate changes described above and physical responses are expected to result in the following relevant key impacts on land, settlements and natural ecosystems (DECCW 2010).

Impacts on land

- Rising sea level is virtually certain to increase coastal recession: sea level rise and storms are virtually certain to increase coastal inundation and erosion, causing the erodible coastline to recede, typically by 20–40 m by 2050 and 45–90 m by 2100. Shoreline retreat is very likely to be higher in estuaries and on beaches with lower gradients, particularly where the ocean breaks through or washes over coastal dunes. Where beaches are backed by seawalls and promenades, there is very likely to be a narrowing and potential loss of sandy recreational areas unless beach replenishment programs are put in place.
- Salt water from sea level rise is likely to affect soils on coastal plains.
- Higher rainfall is likely to increase the risk of mass movement of soils in vulnerable areas.
- Organic matter in soils is likely to increase in most areas, but decline in coastal swamps.
- Sea level rise and flooding are likely to affect Aboriginal cultural heritage values.

Impacts on settlements

- Sea level rise is virtually certain to affect many settlements near estuaries and beaches: residential and commercial beachfront development in the region is virtually certain to be threatened by either ocean inundation or coastline recession. Dwellings, tower blocks, commercial premises, registered clubs, caravan parks, surf clubs, beachfront roads and associated infrastructure will be potentially at risk by 2050.
- Infrastructure at risk includes major ports, airports and sewerage works: Low-lying settlements have a wide range of vulnerable built assets. Many public boat ramps, recreation jetties and wharves are likely to be affected by sea level rise, as well as local roads, parks and reserves. Low-lying sewerage infrastructure is at risk, posing potential risks to water quality and public health.

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- Most property boundaries referenced to the high water mark will change: An important consequence of sea level rise is that beachfront or waterfront property boundaries referenced to the mean high water mark are virtually certain to move inland over time. About 50,000 properties are likely to be affected state-wide, but regional figures are not available.
- Existing coastal protection structures are likely to be affected: For much of the region, infrastructure is already protected by seawalls and revetments, which are likely to require ongoing maintenance as sea levels rise. Sea walls and revetments protect beaches such as Cronulla, Maroubra, Coogee, Bondi, Manly, Curl Curl, Dee Why and Terrigal.
- The frequency, intensity and extent of flooding are likely to increase.
- Urban streams are likely to flood more frequently: Increases in rainfall intensities, particularly in short duration storms, are likely to cause additional flooding from local streams. Floodwaters are likely to rise more rapidly, potentially increasing the danger of these local floods to the community.
- Settlements on estuaries and coastal lakes are vulnerable.
- Water supplies are likely to be affected by hydrological changes.

Impacts on ecosystems

- Sea level rise is likely to threaten coastal ecosystems: Rising watertable and saltwater intrusion are likely to affect lowland ecosystems in the coastal zone. Salt water is likely to approach or reach the surface in lower parts of the landscape, converting freshwater ecosystems into types adapted to more saline conditions.
- Sea level rise is likely to threaten some estuarine communities: Sea level rise and shoreline retreat are likely to induce a large-scale modification or loss of intertidal and sub tidal ecosystems as water depth, turbidity, sedimentation, pH, temperature and salinity change. Mangroves are also likely to be displaced but new mangrove habitat should form in other places.
- Climate change is likely to reduce migratory shorebird habitat and populations: Rock platforms, sand spits, mudflats and salt marshes provide important foraging and nesting areas for a suite of shorebirds, including some species that migrate seasonally along the East Asian–Australasian Flyway. Many migratory shorebird populations have already declined because of habitat modification along migratory routes, and climate change is likely to exacerbate this trend.

The Sydney Coastal Councils Group has assessed the vulnerability of the SCCG region and its' member Councils to climate change. Manly Council possesses a moderate degree of vulnerability to climate change relative to other Councils. However, due to its coastlines and coastal development, vulnerability to sea-level rise and coastal hazards was assessed to be particularly high. In addition, stormwater management may become a challenge in the future due to development and projected increases in rainfall. The vulnerability of the coastline and the paucity of natural landscapes suggest the Council's natural ecosystems have a low resilience to the effects of climate change.

Council has completed a "Manly LGA Climate Change Risk and Adaptation Action Plan" Project under the Commonwealth Department of Climate Change's Local Adaptation Pathways Program (LAPP). Council is building on the outcomes of this project in order to develop a more comprehensive Adaptation Action Plan for Manly LGA which will provide a strategic approach to climate change risk management and adaptation for Manly Council and the community. It will incorporate elements of the Cardno (2008) report titled '*Climate Change Actions for Manly LGA 2008 > 2038*' and also build upon knowledge and outcomes of the Sydney Coastal Council Group's '*Systems Approach to Regional Climate Change Adaptation Strategies in Metropolises*' (2008). Statewide Mutual has been engaged to assist with this process.

2.3.4 Ecological Environment

The Manly Cove marine environment exhibits a diversity of habitats with a wide range of substrata, vegetation, depths, exposures and their combinations with aquatic plant communities being among the most abundant and conspicuous habitats of sub-tidal reefs in Sydney Harbour.

Sydney Harbour is subject to a variety of stresses from human activities that have the potential to decrease species diversity and abundance. The marine environment within the study area ranges from rocky intertidal zone to seagrass beds. Three predominant aquatic communities along the foreshore of the study area are

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'mixed rocky intertidal & sand', 'sandy beaches' and 'seagrass beds'. The conservation status of these three ecological units is 'high', 'medium' and 'high', respectively.

Seagrass beds within the study area provide important foraging grounds for Manly's endangered population of Little Penguins (*Eudyptula minor*). In 2003 *Caulerpa taxifolia* was identified in the waters of Sydney Harbour including a number of locations within North Harbour. This has now been recorded in Manly Cove, as contributed by EcoDivers:

'We first noticed it in Manly cove west in the area behind the pool while conducting seagrass survey around Oct / Nov 2009 . it was in a number of locations and by the end of that summer was rampant throughout the cove. It was probably there in small quantities prior but went unnoticed until then when it became more obvious due the increased spread by fragmentation by constant anchoring in the area.'

The entire pool area was manually cleared and several outbreaks were removed from outside the pool and the areas marked for monitoring, this very time consuming method of removal was found to be effective. The caulerpa being carefully removed by hand and double bagged, dried and burnt approximately 8 sqm of caulerpa was removed much of which was initially isolated plants.'



Source: Eco Divers

The intertidal area within the study area has a range of habitats including rocky reefs and platforms, sandy beaches and artificial habitat including seawalls, jetties, pontoons and a netted swimming enclosure. Significant habitat value is exhibited by the existence of the west Manly Cove netted-swimming enclosure. The enclosure is popular with divers and snorkelers wanting to observe the large colony of protected seahorses known to live amongst the marine growth which grows on the net.

North Harbour Aquatic Reserve lies between an imaginary line from the headlands at North Head and Grotto Point and another line joining Little Manly Point, Manly Point and Forty Baskets Beach. The reserve extends from the seabed at these outer boundaries up to the mean high water mark between them and covers an area

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of approximately 260 hectares. There is a proposal to extend this Aquatic Reserve to include total water area of the Manly Cove study area.

The study area houses a high diversity of marine species due to the close proximity to the ocean and resultant mixing of warm tropical waters from the north and cooler temperate waters from the south meet. A number of populations of protected, endangered and vulnerable marine fauna species are found in the vicinity of the Manly Cove study area

There is an endangered colony of Little Penguins known to utilise the study area for nesting and foraging. Critical habitat has been declared in the south eastern foreshore of Manly Cove and a Wildlife Protected Area at Federation Point. Little Penguins are also nested under the Manly Wharf.

The terrestrial environment within the study area has seen the largest change. Bushland reserves are scattered throughout the study area with Gilbert Park, Tower Hill Park, West Esplanade Park and East Esplanade Park being the largest in area. Smaller patches of bushland on both public and private land do exist throughout, and in some places provide corridors between the reserves. There are four specific vegetation communities present within and/or adjacent to the study area.

Fragmentation, clearance and degradation of native vegetation in the Manly Cove study area have reduced habitat value for native fauna. Small pockets of remnant bushland do exist between Oceanworld and Federation Point and on Manly Point, providing important habitat for the endangered colony of Little Penguins (*Eudyptula minor*). Grassed areas within the study area are also known to provide nesting and foraging habitat for the endangered North Head population of long-nosed Bandicoots (*Perameles nasuta*).

While fauna surveys of natural bushland did not extend to these pockets a total of 22 bird species (2 introduced), 9 mammals (5 introduced) and 4 species of native reptiles were recorded in adjacent bushland reserves. Grey-headed Flying Fox (*Pteropus poliocephalus*) is the only threatened species recorded.

2.4 CURRENT CONDITION

2.4.1 Human Interventions

Human activities have altered and modified the natural systems of the study area. Foreshore development has been extensive. From the early 1820s scattered settlement began in the Manly Cove area. Henry Gilbert Smith bought John Thompson's 100 acres in 1853. In 1855, Smith's Ellensville Plan was drawn up. During this year, Manly Wharf and Pier Hotel were constructed; Corso widened and Sunday ferry service commenced. Manly Pavilion was constructed in 1870. Manly Cove Harbour Pool and Boardwalk was constructed in 1931 but completely damaged during 1974 storm. Seawalls, both public and private, exist throughout the study area. Two prominent seawalls are Manly Cove West Beach Seawall & the Manly Cove East Seawall. The Manly Cove West Beach seawall was constructed around 1900 and extends approximately 230m between Oceanworld to the west and Manly Wharf to the east. The Manly Cove East seawall, originally constructed in the late 1800's, is approximately 270 metres long extending between Manly Wharf and the eastern end of the beach. A number of boating facilities exist within a "Boat Club Precinct" located between the eastern end of Esplanade Reserve and Stuart Street including the Manly Yacht Club, Manly Rowing and Sailing Club, the Manly 16 Foot Skiff Club and the Manly Cove Launch Club. Public access to foreshore is available at several points. There is no public pontoon/jetty in the study area. The five most important activities carried out by residents in Manly Cove are walking/jogging, swimming, passive recreation, picnic/BBQ and commuting. Other activities are boating, sailing, dog walking, snorkelling/scuba diving and recreational fishing. These alterations have all impacted the natural environment.

2.4.2 Processes & Impacts

With most parts of the Manly Cove CZMP study area being highly urbanised, there is significant pressure placed on environmental health.

Water quality is crucial in overall coastal processes and to protect the health of the Manly Cove embayment. The total load of pollutants in stormwater, based on the modelling exercise undertaken for a normal rainfall year, is estimated to be approximately 750 kg/year of total Nitrogen; 100 kg/year of total Phosphorus; 50

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kg/year of Copper, 70 kg/year of Lead, 150 kg/year of Zinc, and 41 tonnes/year of sediment. Roads and residential land-uses deliver the highest loads of almost all pollutants. Two end-of-pipe GPTs presently exist in East Esplanade within the Manly Cove CZMP study area. The Department of Primary Industries (DPI) NSW has placed a ban on all commercial fishing within Sydney Harbour including the study area, because of the presence of elevated levels of dioxins in fish and crustaceans. There are four known sewer overflow locations within the study area, all of which have the potential to significantly impact upon local water quality and the sensitive marine environs of Manly Cove and the North Harbour Aquatic Reserve.

Boating is an extremely popular recreational activity within the study area, but it can have detrimental impacts on the marine environment. Anchors, moorings, propellers and hulls can all damage the seafloor and associated seagrass beds. Also, boating contributes to water pollution which also degrades the marine environment.

An ecosystem health card has also been developed for the study area.

The study area will experience many of the impacts of climate change. These impacts are likely to include: sea level rise; inundations, blocked storm water outlets, and more frequent and more severe storm events.

2.5 CURRENT UTILISATION

The current land uses within the Manly Cove study area are predominantly residential development (55.1%), followed by road surfaces (28.97%), open space and parkland (8.11%), commercial (7.26%) and special uses (0.67%). Long stretches of parkland (Esplanade Park) separate residential and commercial blocks from Manly Cove beaches, except the area from Stuart Street south to Manly Point where residential properties border shoreline. Esplanade Park and a small Oyama Street Reserve occur in the Manly Cove area providing space for many passive activities. Manly Scenic Walkway runs through the study area.

The Manly Cove study area is locally significant providing a range of important uses, services and linkages for the Manly LGA. Manly Wharf, the beaches, harbour and East Esplanade Park are central to many activities.

The numerous festivals, markets, sporting and social events held in the Manly CBD as well as commercial tourism operations within the study area are popular for both tourists and locals alike. It is this popularity which highlights the need to effectively manage Manly Cove to ensure environmental protection while enhancing opportunities for recreation.

The attraction of Manly Cove is enhanced by its generally good water quality. This results in numerous primary and secondary contact recreational pursuits, including swimming, sailing, kayaking, diving, sail boarding, and boat and shore fishing, which are immense value to locals and visitors alike. For these reasons, recreational visitation and use of the waterway is extremely high with significant “flow on” effects for the local and regional economies.

The Manly Cove study area houses a number of key waterside facilities which provide for water based recreation, particularly sailing activities. The Boating Precinct located on the eastern foreshore of Manly Cove was first established by early European settlers during the 1870s, growing with Manly's popularity as a seaside resort. Today the club precinct remains relatively unchanged and creates distinct characteristics which the community has recognised as being important to retain into the future.

The study area is zoned under both the *Manly Local Environment Plan 1988* and the *Sydney Regional Environmental Plan - Sydney Harbour Catchments 2005* or simply the Harbour REP. The Manly LEP establishes land use zones within the study area as zone 2 – Residential, 3 – Business Zone, 5 – Special Uses Zone and 6 - Open Space. The foreshores and waterways of the study area are designated as W2 (Environment Protection) zone under the Sydney Harbour Regional Environmental Plan.

2.6 PLANS OF MANAGEMENT FOR COMMUNITY LANDS

Under the *NSW Local Government Act 1993*, Council is required to prepare Plans of Management (PoMs) for Public Land classified as 'Community Land'. There are three separate parcels of community land within the study area. These include:

- A 209 m² parcel of land described as Tower Hill Park (DP 60402). This parcel is currently used as a Public Reserve.
- The 177 m² parcel of land which makes up a portion of the Town Hall forecourt (DP 1121113); and
- The 650 m² parcel of land at the southernmost tip of Manly Point (DP 2/564246) which is designated as Public Reserve

Each of these parcels is zoned as 'open space'. These lands are used either as reserve or pedestrian pathway.

In 1996 Manly Council prepared a generic Plan of Management for all community lands. This Plan sufficiently meets the requirements for Tower Hill Park (DP 60402) and the parcel of land which makes up a portion of the Town Hall forecourt (DP 1121113).

However, due to the designation of Manly Point as Critical Habitat for the Manly Little penguin population, a specific Plan of Management is required for the public space in front of 'Kilburn Towers' on Manly Point. A Plan of Management, known as the *Plan of Management for Manly Peace Park* (2004) was developed as part of the Little Manly Coastline Management Plan. This PoM includes the land identified as DP 2/564246.

3. STRATEGIC FRAMEWORK & MANAGEMENT STRATEGY

3.1 GENERAL

The Coastal Zone Management Plan (CZMP) is a tool for integrating the needs and values of the environment within the development-based planning framework of local and state government. Therefore, the focus of the Plan is on addressing environmental concerns through a series of actions that are both effective and easy to implement.

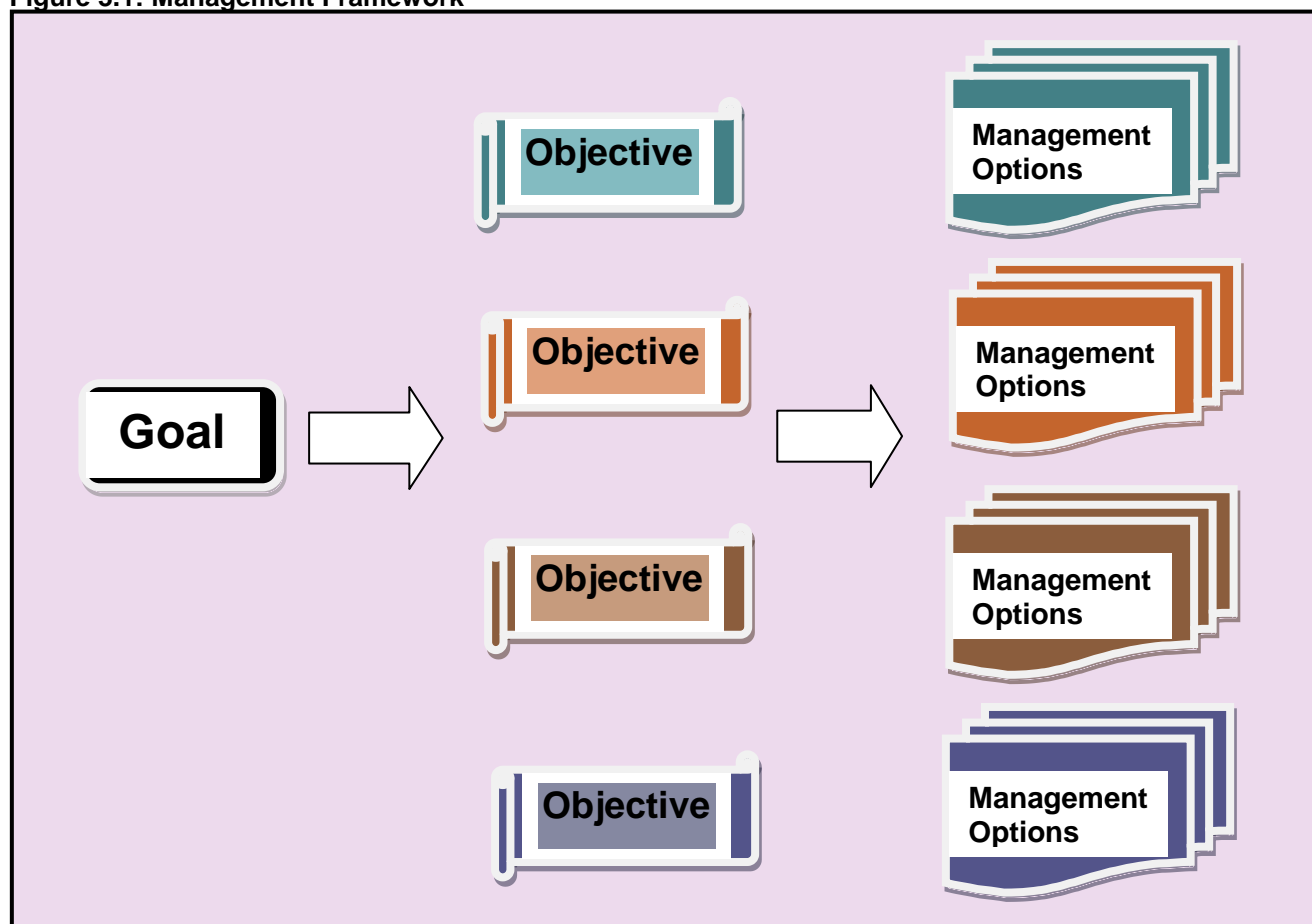
A series of goals and objectives for the future management of the Manly Cove were developed on the basis of information received through the community and stakeholder consultations, input from the the Harbour Foreshores & Coastline Management Committee and a sound appreciation of coastal processes and human interactions.

Key management issues and goals have already been described in section 1.6.

Management Objectives provide the 'goal posts' towards which future management of the Manly Cove should be directed. In short, the objectives aim to rectify the problems or issues faced by the study area, whilst preserving and enhancing its inherent values.

For each management issue a goal has been defined, along with a range of management objectives that have been further partitioned into management options (**Figure 3.1**).

Figure 3.1: Management Framework



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3.2 MANAGEMENT PRINCIPLES

The basis for the Coastal Zone Management Plan needs to be Ecologically Sustainable Development (ESD). ESD is development that aims to meet the needs of the present, while conserving our ecosystems for the benefit of future generations. By following the principles of ESD, we should be able to reduce the likelihood of serious environmental impacts arising from our present day economic activities.

There are four basic principles of Ecologically Sustainable Development (ESD):

1. Conservation of biological diversity and ecological integrity;
2. Social equity, including inter-generational equity;
3. Improved valuation, pricing and incentive mechanisms; and
4. The precautionary principle.

Further, the Guidelines for Preparing Coastal Zone Management Plan (NSW Government & DECCW 2010) describe the following ten principles that should be considered in evaluating potential coastal management actions:

1. Consider the objects of the *Coastal Protection Act 1979* and the goals, objectives and principles of the NSW Coastal Policy 1997 and the NSW Sea Level Rise Policy Statement 2009
2. Optimise links between plans relating to the management of the coastal zone
3. Involve the community in decision-making and make coastal information publicly available
4. Base decisions on the best available information and reasonable practice; acknowledge the interrelationship between catchment, estuarine and coastal processes; adopt a continuous improvement management approach
5. The priority for public expenditure is public benefit; public expenditure should cost-effectively achieve the best practical long-term outcomes
6. Adopt a risk management approach to managing risks to public safety and assets; adopt a risk management hierarchy involving avoiding risks where feasible and mitigation where risks cannot be reasonably avoided; adopt interim actions to manage high risks while long-term options are implemented
7. Adopt an adaptive risk management approach if risks are expected to increase over time, or to accommodate uncertainty in risk predictions
8. Maintain the condition of high value coastal ecosystems; rehabilitate priority degraded coastal ecosystems
9. Maintain and improve safe public access to beaches and headlands consistent with the goals of the NSW Coastal Policy
10. Support recreational activities consistent with the goals of the NSW Coastal Policy

These principles form the basis of matters to be considered in deciding potential coastal management actions.

3.3 STATE & OTHER TARGETS

NSW Government has released, in March 2010, the NSW State Plan 2010. The State Plan is a long term plan to deliver the best possible services to the people of NSW. The challenge is to balance competing demands in an environment of change, high expectations and limited resources. The State Plan is an open and clear response to that challenge, setting clear priorities to guide Government decision making and resource allocation. One of the seven visions set in the State Plan 2010 is "Our energy is clean, our natural environment is protected and we are leaders in tackling climate change". The State will continue to deliver better environmental outcomes for native vegetation, biodiversity and our land, rivers and coastal waterways. One of the Priorities of the NSW State Plan 2010 is:

"Protect our native vegetation, biodiversity, land, rivers and coastal waterways"

specifying the target as "Meet our state-wide targets for natural resource management to improve biodiversity and native vegetation, sensitive riverine and coastal ecosystems, soil condition and socio-economic wellbeing.

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The Natural Resources Commission (NRC) has established the state-wide natural resource management targets (**Box A**).

Box A

State-wide targets for natural resource management

Biodiversity

1. By 2015 there is an increase in native vegetation and an improvement in native vegetation condition.
2. By 2015 there is an increase in the number of sustainable populations of a range of native fauna species.
3. By 2015 there is an increase in the recovery of threatened species, populations and ecological communities.
4. By 2015 there is a reduction in the impact of invasive species.

Water and Coast

5. By 2015 there is an improvement in the condition of riverine ecosystems
6. By 2015 there is an improvement in the ability of groundwater systems to support groundwater dependent ecosystems and designated beneficial uses
7. By 2015 there is no decline in the condition of marine waters and ecosystems
8. By 2015 there is an improvement in the condition of important wetlands, and the extent of those wetlands is maintained
9. By 2015 there is an improvement in the condition of estuaries and coastal lake ecosystems

Land

10. By 2015 there is an improvement in soil condition
11. By 2015 there is an increase in the area of land that is managed within its capability

Community

12. Natural resource decisions contribute to improving or maintaining economic sustainability and social well-being
13. There is an increase in the capacity of natural resource managers to contribute to regionally relevant natural resource management

At regional level, the Sydney Metropolitan Catchment Management Authority (SMCMA) is working to meet community expectations by delivering natural resource management across Sydney. Natural resources include land, rivers, estuaries and coastal systems. The SMCMA meets its government and legislative expectations by implementing the Sydney Metropolitan Catchment Action Plan. This is a strategic planning tool that identifies the key natural resource features the Sydney community wants to protect and improve and has the following vision:

"Community growth reconciled with nature: An urban community that thrives within a valued natural landscape."

The SMCMA has completed its Catchment Action Plan (CAP). The CAP will guide the activities of the SMCMA while forming the basis for partnerships with the community, business, industry and government. The CAP will assist the SMCMA in ensuring that natural resource management projects are undertaken in priority areas within the catchment, and that these projects lead to the best outcomes for the environment and the community. There are four themes: biodiversity, water, land and community. Under each of these, there are Catchment Targets (**Box B**), Management Targets and Key Actions & Partners.

Box B

SMCMA Catchment Targets

Biodiversity

Enhance ecological resilience and connectivity of bushland and aquatic habitats

- CTB1 By 2016 the extent and condition of terrestrial native vegetation in all landscapes is maintained or improved.
- CTB3 By 2016 there is an increase in the connectivity of terrestrial native vegetation.
- CTB4 By 2016 aquatic and terrestrial threatened species and Endangered Ecological Communities (EECs) and endangered populations are better conserved by implementing actions identified in the Priorities Action Statement.
- CTB5 By 2016 the impact of terrestrial and aquatic invasive species on biodiversity is reduced by decreasing the number, distribution and impact of invasive weeds, pest animals and pathogens.

Water

Enhance the positive connectivity of aquatic processes

- CTW1 By 2016 there is a net improvement in the health of modified waterways and riparian corridors and conservation of natural waterways.
- CTW2 By 2016 there is an improvement in the condition and extent of wetlands.
- CTW3 By 2016 there is measurable progress towards achieving the Water Quality and River Flow Objectives adopted for each waterway.
- CTW4 By 2016 there is an improvement in the quality and sustainable use of groundwater systems so that they are able to support groundwater dependent ecosystems and designated beneficial uses.
- CTECM1 By 2016 there is an improvement in the condition of estuaries and coastal lakes.
- CTECM2 By 2016 there is an improvement in the condition of coastal and marine ecosystems.

Land

Reduce the negative edge effects of urban expansion

- CTLD1 By 2016 there is an increase in the amount of land managed within its capability.
- CTLD2 By 2016 implement actions under the Sydney Metropolitan Strategy that recognise, protect and improve key natural resources.
- CTLD 3 By 2016 Indigenous cultural landscape values are identified, acknowledged and incorporated into all natural resource management activities and land use planning.

Community

Improve community and institutional connections between natural resources, strong communities and robust economy

- CTC1 By 2016 more people, communities and organisations have increased capacity to engage in practices that contribute to improved natural resource management.
- CTC2 By 2016 there is improved focus and collaboration between organisations that act in or influence natural resource management.
- CTC3 By 2016 there is a framework for monitoring, evaluating and reporting natural resource indicators.
- CTC4 By 2016 there is improved recognition across the community of the contribution of healthy natural resources to valued social and economic activities in the region.

4. STRATEGIC MANAGEMENT OPTIONS

Strategic management options were formulated covering a wide range of structural and non-structural solutions. Responsibility for implementing the options is spread across local government (planning, management and works staff), state government agencies and volunteer community groups.

This Plan sets 10 Goals and 25 Objectives to be addressed through 66 Management Options (**Table 4.0**). Only 34 of these are new activities. Of these 34, seven management options are proposed for immediate implementation, 15 within 2 years, 10 within 3-4 years and only two at later years. Overall, 32 management options have been rated to have high priority, 29 as medium priority and five as low priority.

Table 4.0 Facts & Figures about proposed management options

Management Issue	Objectives set	Options proposed	Priorities			Activity Type		Implementation Time Frame of new activities			
			High	Medium	Low	On-going	New	Immediate	Within 2 years	Within 3-4 years	On 5 th or later
Aquatic Habitat	3	9	4	5	0	4	5	2	3	0	0
Boating Facilities	3	8	5	3	0	2	6	2	2	2	0
Public Facilities	3	7	4	2	1	2	5	0	4	1	0
Water Quality	3	8	6	2	0	3	5	1	1	2	1
Terrestrial Ecology	2	6	4	2	0	6	0	0	0	0	0
Hazards & Climate Change	5	14	5	8	1	8	6	1	3	1	1
Waste Management	2	6	3	2	1	4	2	0	1	1	0
Access	1	4	0	3	1	1	3	0	1	2	0
Geodiversity	1	2	0	1	1	0	2	1	0	1	0
Heritage Conservation	2	2	1	1	0	2	0	0	0	0	0
Total	25	66	32	29	5	32	34	7	15	10	2

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4.1 OPTIONS ADDRESSING AQUATIC/INTERTIDAL HABITAT CONSERVATION & MANAGEMENT

The key habitat management priority for the study area is to protect habitats of high ecological and coastal value. It is more cost effective to protect these areas now than to rehabilitate them in the future if habitats are allowed to deteriorate.

A total of nine management options are proposed addressing three different objectives. Of these, four management options have been rated as of high priority and the remaining five as medium priority. Two management options have been proposed for immediate implementation. Four management options are already on-going activities.

Goal

Restore and maintain a healthy and diverse mix of aquatic and intertidal habitats that will maintain and improve biodiversity and ecological functions of Manly Cove.

Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
AH.1 To achieve community awareness of and involvement in the conservation of marine ecology through education and participation	AH.1.1 Involve the community and user groups in the provision of marine focussed educational events	On-going	H(2), M(4), L(1)	Medium
	AH.1.2 Encourage the establishment of a community-based seagrass monitoring program following a baseline survey on distribution and health of seagrass in Manly Cove and investigation of the infiltration of non-native seagrass.	Immediate	Council determined	High
AH.2 Ensure all areas of ecological significance are managed in an integrated and sustainable manner	AH.2.1 Pursue a submitted proposal seeking the extension of the boundary of North Harbour Aquatic Reserve to include Manly Cove (Little Manly and North Harbour).	Immediate	H(4), M(1), L(2)	High
	AH.2.2 Assist NSW DPI with preparation and implementation of the North Harbour Aquatic Reserve Management Plan that also includes Manly Cove.	Within 2 years	H(4), M(1), L(2)	High
	AH.2.3 Protect and enhance marine/intertidal habitats within and adjacent to Manly Cove	Within 2 years	H(3), M(4), L(0)	Medium
	AH.2.4 Continue to encourage NSW DPI to support conservation of seagrass beds in Manly Cove.	On-going	H(2), M(5), L(0)	Medium
	AH.2.5 Replacement of the suspended netting currently used for the swimming enclosure at Manly Cove with seahorse habitat friendly net.	Within 2 years	-	High
AH.3 To ensure the activities within	AH.3.1 Encourage recreational fishing but minimise the impact that recreational	On-going	H(3), M(3), L(0)	Medium

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Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
Manly Cove are carried out in a manner that maintains or improves the ecological condition of marine habitats and species	fishing activities have on the intertidal and marine ecology, through education and regulation			
	AH.3.2 Minimise the impact of diver/snorkeler activities and routine maintenance upon the colony of seahorses known to colonise the Manly Cove netted swimming enclosure.	On-going	H(3), M(2), L(3)	Medium

*After adoption of the CZMP

DETAILS OF MANAGEMENT OPTIONS

Objective

AH 1 To achieve community awareness of and involvement in the conservation of marine ecology through education and participation.

AH.1.1 Involve the community and user groups in the provision of marine focussed educational events

Context: Targeted community events and education programs contribute to better understanding and importance of marine ecosystem. The management and protection of aquatic habitats was identified through the community consultation process as a significant issue. The vast majority of submissions identified that the protection of native marine and threatened species, the creation and maintenance of marine reserves and the control of introduced species are all important factors in achieving improved management of aquatic resources. This confirms that the local community is aware of the many issues and pressures faced by our marine environment.

Manly Environment Centre regularly organises marine focussed educational events catering to the needs of various age and user groups. Ocean Care Day, A Day in the Bay are some of regular community events.

Manly Daily can be used to share and disseminate information to the community.

Actions: This option involves regular organisation of education events with increased community participation.

Objectives addressed: AH1

Addressing SMCMA catchment targets: CTC1 – increased capacity to people, communities and organisations

Addressing actions under Manly Council's MSS 2006: C1.3.16 – Encourage community involvement

Performance Target: Education programs continued

Indicative Cost: \$30,000

Time Frame: On-going

Responsible Agency: Manly Council – MEC, EPP

Priority: Medium

AH.1.2 Encourage the establishment of a community-based seagrass monitoring program following a baseline survey on distribution and health of seagrass in Manly Cove and investigation of the infiltration of non-native seagrass.

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Context: Extensive stands of seagrass, kelp and various algae exist across the Manly Cove sea bed. These habitats form fragile ecosystems which can be easily destroyed by a number of anthropogenic activities including reclamation, dredging, the construction of jetties, pontoons, wharves and ramps, water pollution and increased turbidity, poor land management and some recreational activities. I&I NSW map seagrass beds all over NSW every 4-5 years. A lot of changes happen in between. Since March 2010, *Posidonia australis* (Strapweed) seagrass beds in Sydney Harbour (and other places) has been listed as an Endangered Population in NSW. Further *Caulerpa taxifolia* is known to be present in the area. A baseline survey, with assistance from NSW DPI, has become important. Community can then be encouraged to take active role in monitoring seagrass beds. There exists Seagrass-Watch, a community based monitoring program in Queensland. Seagrass-Watch collects data about the condition and trend of near-shore seagrasses and provides an early warning of major changes in seagrass abundance, distribution and species composition.

Actions:

- Encourage and pursue NSW DPI to conduct a baseline survey and mapping at Manly Cove.
- Conduct an investigation on the infiltration of non-native seagrass at Manly Cove
- Assess interest in the community and willingness to volunteer for the work.
- Discuss with NSW DPI about an initiative of a structured community based seagrass monitoring program.
- Establish and agree on a modality including monitoring sites and reporting format.
- Encourage community participation in result analysis and interpretation under a professional direction and liaison with NSW DPI.

Objectives addressed: AH1

Addressing actions under Manly Council's MSS 2006: C1.2.6 – local residents involved in seagrass monitoring; C1.3.16 – Encourage community involvement

Performance Target: Survey & investigation completed; Participatory monitoring initiated

Indicative Cost: \$20,000

Time Frame: Immediate

Responsible Agency: Manly Council- NR, EPP; NSW DPI

Priority: High

Objective

AH 2 Ensure all areas of ecological significance are managed in an integrated and sustainable manner.

AH2.1. Pursue a submitted proposal to DPI to extend the boundary of North Harbour Aquatic Reserve to include Manly Cove (Little Manly and North Harbour).

Context: North (Sydney) Harbour Aquatic Reserve lies between an imaginary line from the headlands at North Head and Grotto Point and another line joining Little Manly Point, Manly Point and Forty Baskets Beach. The reserve extends from the seabed at these outer boundaries up to the mean high water mark between them and covers an area of approximately 260 hectares.

At the Ordinary Meeting of 17 March 2008, Manly Council moved a resolution to extend the boundaries of North Harbour Aquatic Reserve to include Little Manly. Manly Cove and North Harbour.

Letters of support were sought and received from community user groups, NGOs, research organisations, relevant agencies and Precincts. Based on Council resolution, a proposal has been formally submitted to DECC (responsibility now shifted to NSW DPI) for its approval.

Council has received the following response from DECC in a letter dated 7 May 2009:

"The Department is currently analysing adequacy of the existing system of marine protected areas in NSW, and this analysis will inform any decision regarding the declaration of new, or the expansion of existing, marine protected areas including within the Hawkesbury Shelf marine bioregion."

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Action:

- Pursue the submission with NSW DPI

Advantages: Area under aquatic reserve will increase. Biodiversity of the area will be enhanced through expanded regulation and improved management. This will be achieved through a collaborative approach to management, education and compliance.

Disadvantages: Lack of ability for State Government to enable compliance activity

Objectives addressed: AH2

Addressing actions under Manly Council's MSS 2006: C1.2.8 – partnership with NSW DPI and NSW Maritime to conserve marine resources; C1.2.14 – lobby to extend boundary of the Aquatic Reserve in North Harbour

Addressing SMCMA catchment targets: CTECM2 – improvement in the condition of coastal and marine ecosystems

Addressing NRC targets (State Plan 2010): 7 – marine water and ecosystems

North Harbour Aquatic Reserve



The expansion of the Aquatic Reserve does not mean 'no take' for recreational fishing.

Performance Target: North Harbour Aquatic Reserve expanded

Indicative Cost: Staff Cost

Time Frame: Immediate

Responsible Agency: Manly Council – NR

Priority: High

AH 2.2 Assist NSW DPI with preparation and implementation of the North Harbour Aquatic Reserve Management Plan, that also includes Manly Cove.

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Context: The NSW Department of Primary Industries (NSW DPI) is currently responsible for the administration and management of NSW Aquatic Reserves. NSW Aquatic Reserves are managed under the Fisheries Management Act 1994 and the Fisheries Management (Aquatic Reserves) Regulation 2002. Under s197.A of the Fisheries Management Act 1994 the Minister for Environment may make arrangements for the preparation of a Management Plan for an Aquatic Reserve.

The OEH (formerly DECCW), under an Operational Agreement with Manly Council, has already agreed in principle to prepare the North Harbour Aquatic Reserve Management Plan.

The OEH has also prepared, for Cabbage Tree Bay Aquatic Reserve, a draft Fisheries Management (Aquatic Reserve) Regulation 2009 and Implementation Strategy. Similar Regulation is necessary also for the North Harbour Aquatic Reserve.

Community involvement is critical in the management of aquatic reserves. Through public involvement in management planning processes and in implementation, the Government and Council seek to achieve community partnership, providing ongoing protection for the future.

Actions:

- Establish a multi-stakeholder Working Group ensuring wider community representations.
- Assess the current health of the reserve and take appropriate measures
- Carry out User's Survey
- Conduct community consultation and seek input in identifying management options
- Identify management options in consultation with the Working Group
- Prepare and adopt Regulation and Implementation Strategy
- Implement the Management Plan and encourage community monitoring during implementation
- Review the plan periodically as factors like overfishing and climate change has accelerated the impacts marine habitats.

Advantages: This will guide measures to protect biodiversity and varied marine life and habitats of the North Harbour Aquatic Reserve.

Disadvantages: Restrict all types of fishing in all or part of the reserve

Objectives addressed: AH1, AH 2, AH3, HR3 and HR4

Addressing actions under Manly Council's MSS 2006: C1.2.8 – partnership with NSW DPI and NSW Maritime to conserve marine resources

Addressing SMCMA catchment targets: CTB4 – aquatic threatened species are better conserved; CTECM2 – improvement in the condition of coastal and marine ecosystems; CTC1 – community engagement in improved NRM

Addressing NRC targets (State Plan 2010): 7 – marine water and ecosystems

Performance Target: Strategy prepared and implemented

Indicative Cost: Staff Time

Time Frame: Within 2 years

Responsible Agency: NSW DPI, NSW Maritime and Manly Council – NR

Priority: High

AH2.3. Protect and enhance marine/inter-tidal habitats within and adjacent to Manly Cove.

Context: Foreshores of Sydney Harbour and all its tributaries are protected under Intertidal Protected Area (IPA) excluding foreshores of Manly Cove (see map under AH 2.1). Excluded areas are foreshores north of a line from Manly Point to the south end of Forty Baskets beach.

There are currently nine IPAs in NSW. These are temporary fishing enclosures and complement the NSW marine protected area system by protecting rocky shore intertidal invertebrates. IPAs extend from the mean high water mark to 10 meters seaward from the mean low water mark. IPAs are declared

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under the Fisheries Management Act 1994 and are managed by NSW DPI. The aim of these IPAs is to minimize threats and to ensure the sustainability of rocky shore animals and plants.

Inter-tidal habitats within and adjacent to Manly Cove (including North Harbour) will be protected through obtaining Intertidal Protected Area (IPA) status of the area.

Actions:

- *Prepare a background paper and proposal for declaring rocky foreshores of North Harbour as IPA.*
- *Collect and collate letter of support from relevant agencies and Precincts*
- *Submit the proposal to I&I NSW and pursue for its approval*

Advantages: *Area under IPA will increase. Biodiversity of the area will be protected.*

Disadvantages: *There are no apparent disadvantages*

Objectives addressed:

Addressing actions under Manly Council's MSS 2006: C1.2.8 – partnership with NSW DPI and NSW Maritime to conserve marine resources

Addressing SMCMA catchment targets: CTB4 – aquatic threatened species are better conserved; CTW2 – improvement in condition and extent of wetlands; CTECM2 – improvement in the condition of coastal and marine ecosystems

Addressing NRC targets (State Plan 2010): 7 – marine water and ecosystems; 8 – improvement and maintenance of wetlands

Performance Target: *Proposed intertidal areas declared as IPA.*

Indicative Cost: *Staff time*

Time Frame: *Within 2 years*

Responsible Agency: *NSW DPI, Manly Council – NR*

Priority: *Medium*

AH 2.4. Continue to encourage NSW DPI to support conservation of seagrass beds in Manly Cove.

Context: *Seagrass beds exist on both sides of the Manly Wharf. Seagrass beds provide extremely important aquatic habitat by providing food and shelter for a variety of juvenile fish and invertebrate species. Many such species are of considerable value to recreational and commercial fishing industries. Hence, it is important to conserve existing beds. These areas are identified as Wetlands Protected Area under the Sydney Regional Environmental Plan (Sydney Harbour Catchment), 2005.*

Actions:

- *Request NSW DPI to undertake accurate mapping of seagrass in Manly Cove*
- *Liaise with NSW DPI regularly regarding updated information on seagrass mapping, threats and management*
- *Periodic updates of macrophyte distribution map within the study area.*
- *Facilitate measures to remove/ reduce threats to seagrass so as to foster natural re-establishment.*
- *Study impacts of Fast Ferries on sedimentation and seagrass beds.*
- *Conserve seagrass beds through community education and compliance monitoring.*
- *Ensure water based development does not negatively impact on marine vegetation.*
- *Request NSW Maritime to enforce NSW DPI advice that anchoring off the swimming enclosure over the seagrass area in western area of Manly Cove will be prohibited*

Advantages: *Continued conservation of these ecologically valuable habitats.*

Disadvantages: *The boating activity will be severely restricted if the updated map identifies new and expanded areas with seagrass beds*

Objectives addressed: **AH2**

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Addressing actions under Manly Council's MSS 2006: C1.2.6 – local residents involved in seagrass monitoring; C1.2.8 – partnership with NSW DPI and NSW Maritime to conserve marine resources

Addressing SMCMA catchment targets: CTB4 – aquatic threatened species are better conserved; CTECM2 – improvement in the condition of coastal and marine ecosystems

Addressing NRC targets (State Plan 2010): 1 – improvement in native vegetation condition; 7 – marine water and ecosystems; 8 – improvement and maintenance of wetlands

Performance Target: Areas of seagrass beds conserved.

Indicative Cost: Staff time

Time Frame: on-going

Responsible Agency: Manly Council – NR, NSW DPI

Priority: Medium

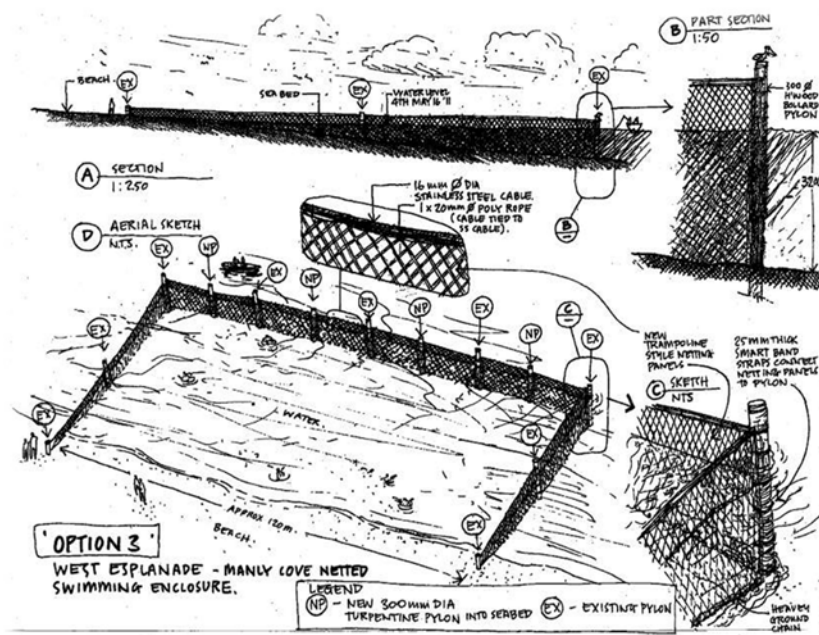
AH.2.5 Replacement of the suspended netting currently used for the swimming enclosure at Manly Cove with seahorse habitat friendly net.

Context: The Big-belly seahorse *Hippocampus abdominalis* and White's seahorse *Hippocampus whitei* are known to occur on the netted swimming enclosure waters of Manly Cove. The colony of seahorse population is impacted when the nets are maintained and replaced.

Council, at its meetings dated 14 March 2011 and 6 June 2011, has resolved to implement both short and long-term options. The options are:

Short Term	Cut existing net to 1.5m and rehang from seabed to this height
Long-term (option 3)	Remove entire current net; install 4 new pylons along outer edge at intervals between existing pylons. Install trampoline style netting in 8 sections along the outer edge (15m wide) and along the sides (each 30m wide).

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The long-term option has many benefits including ease of seahorse monitoring, a single layer of net to maintain, clean, repair etc. in future, improved aesthetic appeal and a long life expectancy.

Actions: The option involves,

- Pursue implementation through budget bidding and detailed design.

Objectives addressed: AH3

Addressing SMCMA catchment targets: CTB4 – aquatic threatened species are better conserved; CTECM2 – improvement in the condition of coastal and marine ecosystems

Performance Target: Disturbance to seahorse habitat minimised

Indicative Cost: Staff time & contract (\$85,000)

Time Frame: Within 2 years

Responsible Agency: Manly Council –NR

Priority: -

Objective

AH 3 To ensure the activities within Manly Cove are carried out in a manner that maintains or improves the ecological condition of marine habitats and species.

AH.3.1 Encourage recreational fishing but minimise the impact that recreational fishing activities have on the intertidal and marine ecology, through education and regulation

Context: Recreational fishing is one of the most common activities undertaken within the study area. A total of 17% of the NSW population participate in recreational fishing. This is almost 24% of the NSW male and 10% of female population. Almost half the State's recreational fishers live in Sydney. Manly Council has recently registered itself as Fish Friendly Council.

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Various bag and size limits apply to recreational fishers for most common fish species. A number of changes to size limits, bag limits and fishing methods were introduced in September 2007. However, not everyone adheres to these regulations. These often impacts on intertidal and marine ecology of the area. Regular educational program is important.

Actions: The option involves working with NSW DPI to improve recreational fishing practices through educational programs. Fish care Volunteers talk to anglers about fishing rules and responsible fishing and help in a range of activities, such as fishing clinics, catch surveys and community fishing events. Policing is an important component of facilitating recreational fishing. Efforts should be made to raise awareness of recreational fishers about the diversity and importance of flora and fauna of the area.

Advantages: This will also raise awareness of the importance of conservation of these areas and the diversity of fauna and flora in the community.

Disadvantages: -

Objectives addressed: AH3

Addressing actions under Manly Council's MSS 2006: C1.2.12 – police breaches of bag limits; C1.2.13 – foster behaviour change amongst marine recreational users

Addressing SMCMA catchment targets: CTC1 – people and communities have increased capacity to engage in improved natural resource management; CTC4 – community recognising the contribution of healthy natural resources

Performance Target: Education program implemented

Indicative Cost: Staff time

Time Frame: On-going

Responsible Agency: NSW DPI and Manly Council – Rangers, EPP

Priority: Medium

AH.3.2 Minimise the impact of diver/snorkeler activities and routine maintenance upon the colony of seahorses known to colonise the Manly Cove netted swimming enclosure.

Context: The Big-belly seahorse *Hippocampus abdominalis* and White's seahorse *Hippocampus whitei* are known to occur in the waters of Manly Cove, with a large population of seahorses colonising artificial structures within the study area, particularly the netted swimming enclosure as well as substructures of Manly Wharf, Ocean World and the various boating facilities along the eastern boundary of the study area. The population is estimated to be around 400.

The enclosure is popular with divers and snorkelers wanting to observe the large colony of protected seahorses known to live amongst the marine growth which grows on the net. A number of general concerns have been expressed regarding diver use of the area

Actions: The option involves,

- In consultation with divers and snorkelers, minimise diving to seahorse colony.
- Consider constructing a permanent habitat structure for seahorses on the swimming enclosure net
- Consider developing a 'Code of Conduct' for divers and snorkelers.

Objectives addressed: AH3

Addressing SMCMA catchment targets: CTB4 – aquatic threatened species are better conserved; CTECM2 – improvement in the condition of coastal and marine ecosystems

Performance Target: Diving minimised

Indicative Cost: Staff time

Time Frame: On-going

Responsible Agency: Manly Council – MEC, EPP, NR

Priority: Medium

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4.2 OPTIONS ADDRESSING BOATING, MARITIME OPERATIONS & FACILITIES

The embayment of Manly Cove offers a diverse range of opportunities for recreational and commercial boat and watercraft use. The study area is also used as a temporary and permanent anchorage and mooring site. Wind surfing, canoeing, dragon boating, kayaking, outriggering and a variety of sailing activity is conducted in the vicinity of the Manly Cove study area. There are a number of safety and environmental issues associated with boating and maritime operations

Goal

To achieve the highest level of environmental protection and safety for maritime operations within Manly Cove.

A total of eight management options are proposed addressing three different objectives. Of these, five management options have been rated as of high priority and the remaining three as medium priority. Two management options are proposed for immediate implementation. Two management options are already on-going activities of Council.

Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
BF.1 To improve the sustainability of boating activities in Manly Cove	BF.1.1 To encourage boat user groups to play a role in educating the boating community on best practice	Within 2 years	H(3), M(3), L(2)	Medium
	BF.1.2 Ensure Manly Council Rangers are aware of Spill Response Procedures for both on-water and off-water incident	Within 2 years	H(7), M(1), L(0)	High
BF.2 To ensure boating activities are conducted through positive interactions with other user groups	BF.2.1 Encourage compliance with NSW Maritime boating regulations	On-going	H(7), M(1), L(0)	High
	BF.2.2 Sustainably manage the extent to which commercial operators access and use the Manly Cove embayment	Between 3-4 years	H(5), M(2), L(1)	High
	BF.2.3 Ensure skiff rigging and storage activities accommodate other users of East Esplanade Reserve	On-going	Council determined	High
BF.3 To support recreational (and commercial) boating activities through the provision of safe, user friendly facilities	BF.3.1 Work with NSW Maritime to modify and improve a wharf facility for public use in Manly Cove	Immediate	H(5), M(2), L(0)	High
	BF.3.2 Encourage NSW Maritime, NSW DPI and boat owners to install seagrass friendly moorings throughout Manly Cove	Between 3-4 years	H(1), M(4), L(0)	Medium
	BF3.3 Develop a long-term maritime infrastructure facilities plan for Manly LGA emphasizing boat storage and other infrastructures	Immediate	H(3), M(4), L(1)	Medium

*After adoption of the CZMP

DETAILS OF MANAGEMENT OPTIONS

Objective

BF 1 To improve the sustainability of boating activities in Manly Cove.

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BF.1.1 To encourage boat user groups to play a role in educating the boating community on best practice

Context: The social acceptability and community ownership of waterway usage could be improved by increasing the knowledge base of all boat users in relation to acceptable and safe forms of boating. It is important to educate recreational boat users (RBU's), industry and the general community about ways to interact with the marine environment in a sustainable way. NSW Maritime, as the principal body charged with the management of boating activity in NSW waters provide a range of educational brochures which aim to minimise the impact of activities such as engine maintenance, boat cleaning, fuelling, sewage effluent management, water conservation, anchoring and boat wakes on the marine environment. Environmental knowledge is also now incorporated into the NSW Boat Licence content.

Manly's marine environment is highly diverse and supports many delicate ecosystems and an abundance of life, including 16 protected, vulnerable, or endangered species, such as the Little Penguin. Boat user Groups may be encouraged to educate people about the preservation of this marine environment to ensure its survival for future generations to enjoy.

Actions: The option involves:

- Encourage boat user groups to initiate educational programs.
- Assess a draft proposal 'Manly Cove - Community Boatshed & Access and Ability Centre' prepared in 2005.

Objectives addressed: BF1

Addressing NRC targets (State Plan 2010): 12 – natural resources decisions to improve economic sustainability and social well-being

Addressing SMCMA catchment targets: CTC 2 – collaboration between organisations to influence natural resource management

Performance Target: Education program initiated

Indicative Cost: \$25,000

Time Frame: within 2 years

Responsible Agency: Manly Council – EPP

Priority: Medium

BF.1.2 Ensure Manly Council Rangers are aware of Spill Response Procedures for both on-water and off-water incident

Context: Given the volumes of oil that are transported worldwide on a daily basis, a realistic strategy must recognise that a major spillage could occur at any time or place in our estuarine or coastal waters. In fact, Sydney Harbour has experienced a number of oil spills over the last decade. On 3 August 1999 the Laura D'Amato, an Italian registered oil tanker, pumped an estimated 250 to 300 tonnes of oil into Sydney Harbour. This was the largest ship sourced oil spill in Sydney Harbour.

Australia has a national strategy for dealing with pollution from ships called the National Plan to Combat Pollution of the Sea by Oil and Other Noxious and Hazardous Substances, commonly referred to as the National Plan. NSW Maritime is responsible for ensuring the National Plan obligations are implemented in NSW. The arrangements for how NSW will respond to and manage the cleanup of marine oil and chemical spills from shipping incidents are set out in the NSW State Waters Marine Oil and Chemical Spill Contingency Plan. The plan is also a sub-plan of the NSW Disaster Plan.

Manly Cove study area is shown to have moderate to high levels of sensitivity to an oil spill. Hence it is important that Council prepares itself for emergency responses to oil spills.

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NSW Maritime conducts several training courses in various locations along the NSW coast. Personnel from NSW Maritime are also available to make presentations at other forums. NSW Maritime also exercises the NSW oil and chemical spill response arrangements regularly to ensure personnel are familiar with contingency planning.

While spills may be infrequent, if or when they do occur, then the level and speed of response can be critical in minimising environmental damages.

Action: The option involves training Council Rangers on response procedures to oil spill.

Objectives addressed: BF1

Addressing NRC targets (State Plan 2010): 12 – natural resources decisions to improve economic sustainability and social well-being

Addressing SMCMA catchment targets: CTC1 – increased capacity to engage in practices to contribute improved natural resource management

Performance Target: Education program initiated

Indicative Cost: Staff time

Time Frame: Within 2 years

Responsible Agency: Manly Council – EPP

Priority: High

Objective

BF.2 To ensure boating activities are conducted through positive interactions with other user groups.

BF.2.1 Encourage compliance with NSW Maritime boating regulations

Context: While Manly Cove serves as a major transport and commuter access point, the study area also provides opportunities for a wide range of water and land-based recreational activities. Community consultation survey results highlighted that 80% of people surveyed considered the ability to undertake recreational activities as being of importance to them. The impact of recreational activities upon the environment is exacerbated through the high visitor numbers observed within Manly Cove.

A small portion of the Manly Cove embayment is subject to speed controls for boating. A four (4) knot speed limit exists from the foreshore between Stuart Street south to Manly Point and extending 100 metres offshore from the MHW. This speed zone also lies adjacent to the area designated as Critical Habitat for Manly's Little Penguin Population. Assigned by NSW Maritime the designated 4-knot zones assist with the protection of seagrass beds and address safety concerns of passive foreshore user groups.

The NSW Maritime's Boating Handbook provides essential boating information for operating on NSW waters. There are regulations concerning safety of boats in water. Compliance of regulations is a major concern. NSW Maritime does not have adequate boating officers to always monitor compliance. Hence boating community can assist NSW Maritime to monitor compliance. Boating Clubs do organise regular training nights on boating regulations to assist members.

Action: The option involves boating community to assist NSW Maritime to monitor compliance and report any non-compliance.

Objectives addressed: BF2

Addressing NRC targets (State Plan 2010): 12 – natural resources decisions to improve economic sustainability and social well-being

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Addressing SMCMA catchment targets: CTC 2 – collaboration between organisations to influence natural resource management

Performance Target: Compliance of regulations increased
Indicative Cost: Staff time
Time Frame: on-going
Responsible Agency: Manly Council – EPP, Rangers, NSW Maritime
Priority: High

BF.2.2 Sustainably manage the extent to which commercial operators' access and use the Manly Cove embayment

Context: The embayment of Manly Cove offers a diverse range of opportunities for recreational and commercial boat and watercraft use including kayak hire facilities. The study area is also used as a temporary and permanent anchorage and mooring site. There are a number of safety and environmental issues associated with boating and maritime operations within Sydney Harbour. Issues such as incident (including spills) management, water traffic safety and ballast water and marine pest management are controlled by a range of state and federal government agencies, with Manly Council supporting through education.

Stakeholders and community have identified the regular movement of regular and fast Ferries as having significant impact on the day-to-day activities conducted on the eastern foreshores. The wake generated by these vessels is found to create considerable wave heights resulting in increased noise and wash and unsafe conditions for passive recreational users, particularly during high tidal conditions. The impacts are particularly evident for Saleability activities. Fast ferries may have impact on penguin's path to their foraging and breeding grounds.

Action: The access to commercial operators should be considered retaining interest of the passive and recreational users of Manly Cove. Study impacts of Fast Ferries on penguin's path to their foraging and breeding grounds.

Objectives addressed: BF2

Addressing NRC targets (State Plan 2010): 12 – natural resources decisions to improve economic sustainability and social well-being

Performance Target: Sustainable management of the area
Indicative Cost: Staff time
Time Frame: Between 2-4 years
Responsible Agency: NSW Maritime
Priority: High

BF.2.3 Ensure skiff rigging and storage activities accommodate other users of East Esplanade Reserve

Context: Skiff sailboat rigging activities have been identified as impacting upon the general use of East Esplanade Reserve. While this activity has been ongoing for many years and contributes to the historic use of Manly Cove, rigging during weekend competition often results in East Esplanade Reserve being dominated by one use and undesirable for other uses, particularly during summer weekends.

Action: The option involves continued historic use of the reserve for skiff rigging but stakeholder's dialogue to be initiated to devise mutually acceptable sharing of the reserve.

Objectives addressed: BF2

Addressing NRC targets (State Plan 2010): 12 – natural resources decisions to improve economic sustainability and social well-being

Performance Target: acceptable sharing of the reserve ensured

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Indicative Cost: Staff time
Time Frame: On-going
Responsible Agency: Manly Council – CEC
Priority: High

Objective

BF.3 To support recreational (and commercial) boating activity through the provision of safe, user friendly facilities.

BF.3.1 Work with NSW Maritime to modify and improve a wharf facility for public use in Manly Cove

Context: There is currently a lack of public wharf facilities within North Harbour including Manly Cove. Prior to the current lease agreement, recreational vessels were able to use Manly Wharf for transfer of passengers and goods in a safe user-friendly location. However, vessels are now charged at premium rates to utilize Manly Wharf regardless of the time they are berthed. This issue has been raised by numerous groups and individuals during the consultation process, including the Little Manly and Fairlight Precincts. One of the three facilities can be improved and/or modified for public use.

1. *Manly Fun Pier Wharf. (The wharf extending out from the Wharf Hotel, currently used by the private fast ferry company and other commercial users with money paid to Wharf lease holder) This wharf requires no development to be suitable for public use but requires NSW Maritime to remove the wharf from the lease provided to current lease holder of Manly Wharf.*
2. *Oceanworld wharf extending out from Oceanworld (West Esplanade) and/or Pavilion Restaurant. This wharf requires renovation to be suitable for public use. Existing lease could be an issue.*
3. *Little Manly Point, southern end adjacent to the BBQ and picnic areas. There was a wharf in place while they were building the Northside Storage Tunnel (Sydney Water). This area is very suitable for safe access etc but is further from the Manly CBD.*

NSW Maritime's, now provoked Framework Plan for Manly Cove East, also recommended 'Assess potential locations for a public wharf within the Club Precinct (NSW Maritime 2005).

Actions:

- Pursue NSW Maritime to consider any or one of the three proposed locations as a public wharf
- NSW Maritime reconsiders use of Manly Wharf as a pick up and set down point for recreational boats
- Develop and design a modification on the selected site
- Ensure that any public wharf facility is wheelchair accessible
- Encourage NSW Maritime to build/improve/modify the wharf for public use.

Objectives addressed: BF3

Addressing NRC targets (State Plan 2010): 12 – natural resources decisions to improve economic sustainability and social well-being

Addressing SMCMA catchment targets: CTC 2 – collaboration between organisations to influence natural resource management

Performance Target: Public wharf identified, improved and used
Indicative Cost: \$60,000
Time Frame: Immediate
Responsible Agency: NSW Maritime, Manly Council – NR
Priority: High

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BF.3.2 Encourage NSW Maritime, NSW DPI and boat owners to install seagrass friendly moorings throughout Manly Cove

Context: The total number of moorings within Manly Cove is capped at the existing number of 96 moorings, 86 for private use and nine for commercial.

The NSW DPI has, with NSW Maritime, SMCMA and Manly Council, as part of federally funded project, has installed 30 seagrass friendly moorings in Manly Cove, Manly in 2009.

The system uses a single point screwed into place mooring post as the anchor point. Attached to the mooring post just below the sea bed is a set of load spreaders to stabilize the post. This is then attached to shock absorber to the swivel head and run a hawser rope from the shock absorber to a surface buoy.

Actions: The option involves working with NSW DPI and NSW Maritime to install more seagrass friendly moorings. However, analyse the benefits and problems associated with already installed seagrass friendly moorings in the area.

Objectives addressed: BF3

Addressing actions under Manly Council's MSS 2006: C1.2.15 – lobby for eco-friendly mooring buoys to replenish sea grasses; C1.2.16 – upgrade all moorings to seagrass friendly moorings

Addressing SMCMA catchment targets: CTB4 – aquatic threatened species are better conserved; CTECM2 – improvement in the condition of coastal and marine ecosystems; CTC 2 – collaboration between organisations to influence natural resource management

Addressing NRC targets (State Plan 2010): 4 – reduction in the impact of invasive species;



Photo source: <http://www.abc.net.au/tv/newinventors/txt/s1940114.htm>

Performance Target: Additional moorings installed

Indicative Cost: Staff time

Time Frame: Between 3-4 years

Responsible Agency: NSW Maritime, NSW DPI and Manly Council-NR

Priority: Medium

BF.3.3 Develop a long-term maritime infrastructure facilities plan for Manly LGA emphasising boat storage facilities and other infrastructures

Context: Council has at present 118 dinghy and 27 kayak storage spaces at Little Manly and Forty Baskets. However, there is long waiting list for 130 dinghy and 90 kayak storage spaces. Council will be

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developing soon a boat storage facility at Sandy Bay. The demand is much higher at different locations. There are also demands for public wharves, jetties, pontoons, boat ramps.

It is time to carry out a comprehensive study and develop a plan on need and possible locations to establish maritime infrastructure, such as boat storage, pontoons, public wharf, boat ramps over the whole LGA basis.

Once the plan is developed, implement this plan in a structured manner. This plan will also allow Council to seek external assistance, especially from NSW Maritime.

Actions:

- *Identify demand for different types of maritime infrastructure for short, medium and long term time frame through a comprehensive study*
- *Identify locations for different maritime infrastructures considering areas at risks due to sea level rise*
- *Develop a comprehensive plan in line with NSW Maritime's long-term plans and an implementation strategy*
- *Seek financial support to implement the plan.*

Objectives addressed: BF3

Addressing NRC targets (State Plan 2010): 12 – natural resources decisions to improve economic sustainability and social well-being

Performance Target: Plan developed

Indicative Cost: Staff time

Time Frame: Immediate

Responsible Agency: Manly Council – Natural Resources, NSW Maritime

Priority Medium

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4.3 OPTIONS ADDRESSING ENHANCEMENT OF PUBLIC FACILITIES, INFRASTRUCTURES & SIGNAGE

Infrastructure provision, more specifically social infrastructure provision are important to people. The presence of these kinds of infrastructure has a direct impact on living conditions, health and potential for economic development. Social infrastructures are usually considered services, such as public toilets, neighbourhood centres, informative signage, parks, and open space etc.

Goal

Public facilities, infrastructure and signage are upgraded and maintained to facilitate improved social amenity.

A total of seven management options are proposed addressing three different objectives. Of these, four management options have been rated as of high priority, two as of medium priority and the remaining one as having low priority. Two management options are already on-going activities.

Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
PF.1 To provide well maintained and safe facilities and infrastructure on Manly Council owned and/or managed public lands	PF.1.1 Prepare and implement an updated Landscape Masterplan for the Esplanade Reserve	Within 2 years	H(1), M(4), L(3)	Medium
	PF.1.2 Upgrade seating and picnicking facilities within East and West Esplanade Reserves	Within 2 years	H(4), M(2), L(2)	High
	PF.1.3 Community needs are facilitated in areas along the Esplanade Reserves	Within 2 years	-	Medium
	PF.1.4 Provide freshwater bubblers within East and West Esplanade Reserves.	Within 2 years	Council determined	High
PF.2 Provide up-to-date regulation and interpretive signage appropriate for the locality and which meets Councils legislative requirements	PF.2.1 Undertake review of existing compliance signage which meets Councils legislative requirements	On-going	H(1), M(2), L(5)	Low
	PF.2.2 Replace damaged and/or missing signage in line with findings of signage audit and to reduce negative impacts upon visual character of Manly Cove through signage consolidation	Between 3-4 years	H(4), M(2), L(1)	High
PF.3 Reduce the adverse impacts of features that detract from the visual quality of Manly Cove	PF.3.1 Ensure all new development complies with the landscape provisions of the Development Control Plan for Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.	On-going	H(5), M(2), L(1)	High

*After adoption of the CZMP

DETAILS OF MANAGEMENT OPTIONS

Objective

PF.1 To provide well maintained and safe facilities and infrastructure on Manly Council owned and/or managed public lands.

PF.1.1 Prepare and implement an updated Landscape Masterplan for the Esplanade Reserve

Context: East and West Esplanade Reserves are the most frequently used recreational and resting spots by residents and visitors. Main features include harbour views and Norfolk Island pines, scenic walkway with tiles featuring "Manly Pathway of Olympians and Paraolympians" along the seawall, access to beach with swimming enclosure, and picnic facilities. Access to Manly Visitor Information Centre at the Wharf, Manly Art Gallery & Museum, Oceanworld, and Waterworks at the western end. The provision of lighting within the study area enhances the heritage feel of the area by emulating original lighting for Manly Cove. The rounded lighting, often referred to as a "ring of pearls" by visitors, incorporates Council emblems while providing safety and an attraction to the promenade area at night.

The existing picnic and seating facilities were last upgraded during the major landscaping works in 1988. Community consultation and visual inspection identified the fact that the picnic facilities are often extremely dirty and unhygienic and that many chairs have been vandalised. Opportunities to improve water and energy conservation measures also exist.

With the increasing use of the Reserve, it has become necessary to prepare a detailed Landscape Masterplan. The Masterplan should seek to distribute appropriately the various functions of the reserve and to maximise the opportunities presented by the foreshore setting and by the arrangement of the elements within it. Principles, to prepare the Masterplan, are:

- recognition of value of the existing open spaces and landscape;
- reinforcement of the existing native and indigenous planting and bushland;
- further establishment of safe, quiet and planted seating and picnic areas around the edges;
- recognition of existing play area with upgraded play equipments;
- consideration of noise issue
- protection of little penguin area; and
- emphasis of the historic past with signage and other interpretative and informative features.

The Plan should review of the lighting in east and West Esplanade reserve. There are many dangerous dark spots.

Actions:

- Commission a Landscape Masterplan preparation of East & West Esplanade Reserves including site survey
- Consult Precincts and community after plan preparation through public exhibition of the Plan.
- Implement the adopted Masterplan gradually.

Advantages: A planned improvement of East & West Esplanade Reserves will satisfy user needs

Disadvantages: -

Objectives addressed:

Addressing actions under Manly Council's MSS 2006: B1.4.2 walking trails in open spaces; B1.4.4 – Access to all recreational facilities

Addressing SMCMA catchment targets: CTLD1 – increase in the amount of land managed within its capability

Performance Target: Masterplan prepared, adopted and implemented

Indicative Cost: \$36,000 for masterplan only

Time Frame: Within 2 years

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Responsible Agency: Manly Council-SLUP, Parks & Bushland, Urban Services

Priority: Medium

PF.1.2 Upgrade seating and picnicking facilities within East and West Esplanade Reserves

Context: East and West Esplanade Reserves on both sides of the Manly Wharf are popular places for both local and visiting families. The existing picnic and seating facilities were last upgraded during the major landscaping works in 1988. Community consultation and visual inspection identified the fact that the picnic facilities are often extremely dirty and unhygienic and that many chairs have been vandalised.

Actions: The option involves auditing of existing facilities, and undertakes a replacement program.

Objectives addressed: PF1

Addressing actions under Manly Council's MSS 2006: D1.5.2 – ensure livable neighbourhoods

Performance Target: Facilities enhanced

Indicative Cost: \$75,000

Time Frame: within 2 years

Responsible Agency: Manly Council – Urban Services

Priority: High

PF.1.3 Community needs are facilitated in areas along the Esplanade Reserves

Context: Fairlight Precinct has proposed a number of facilities/actions that require attention and implementation including:

- Additional video surveillance in the area near Oceanworld
- Needle bins in the toilets near Oceanworld
- Relocation of shower at Manly Wharf to make it accessible in the evenings when penguin protection barriers are in place
- Investigation into accessibility compliance of the access ramp at Manly Wharf area and implement needed modifications, if any.
- Noise management from late night venues
- Community safety and residential parking

Actions: The option involves investigation into these issues and undertakes required activities subject to availability of funds.

Objectives addressed: PF1

Performance Target: Facilities enhanced

Indicative Cost: \$40,000

Time Frame: Within 2 years

Responsible Agency: Manly Council – Urban Services

Priority: High

PF.1.4 Provide freshwater bubblers within East and West Esplanade Reserves.

Context: To reduce bottled water's impact on our environment and help combat climate change Manly Council has installed six wheelchair accessible filtered bubblers on Manly Corso and on Manly beachfront. These have proven to be so successful that Manly Council is now adding at least 14 more. The bubblers provide Manly visitors with free filtered water - a much better alternative to purchasing bottled water. The Filtered Bubbler Project aims to combat climate change and decrease our impact on the environment by reducing the consumption of bottled water and associated waste.

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Natural resources are further wasted with a large proportion of the bottles ending up in landfill rather than being reused and recycled.

Actions: The option involves installation of water bubblers at least at two locations within the East & West Esplanade Reserves.

Objectives addressed: PF1

Performance Target: New water bubblers installed

Indicative Cost: \$20,000

Time Frame: within 2 years

Responsible Agency: Manly Council – Urban Services

Priority: High



Objective

PF.2 Provide up-to-date regulation and interpretive signage appropriate for the locality and which meets Councils legislative requirements.

PF.2.1 Undertake review of existing compliance signage which meets Councils legislative requirements

Context: Signage within the study area is diverse and comprehensive and has been developed over many years of visitation. Signs have been strategically and prominently placed throughout the study area. Signs play an important role in the management of natural areas. This communication tool provides an important link between the various management authorities and the public. Signs can be used to orientate visitors (directional), inform them about their surroundings (interpretive), or influence their behavior (managerial). Sizing and design are important encourage their reading and user compliance, while reducing aesthetic impact. In this regard, Fairlight Precinct suggests that signage relating to Little Penguin be lowered to a level where it is visible to and readable by passing users. Council should periodically review signage present in the study area. The main aim of this review should be:

- Identify existing signs within the area;
- Evaluate the information they provide;
- Investigate the feasibility of consolidating information onto fewer signs in a format consistent with Council's updated signage specifications;
- Identify signage for removal; and
- Identify signage gaps.

Actions: The option involves a) periodic review of all signage and b) develop recommendations.

Objectives addressed: PF2

Addressing actions under Manly Council's MSS 2006: C1.3.11 – Interpretive signage at high profile recreational areas

Performance Target: Review completed

Indicative Cost: Staff time

Time Frame: On-going

Responsible Agency: Manly Council – SLUP

Priority: Low

PF.2.2 Replace damaged and/or missing signage in line with findings of signage audit and to reduce negative impacts upon visual character of Manly Cove through signage consolidation

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Context: The improper, damaged, inconsistent or excessive use of signs weakens their value as a means of communication and adversely affects the scenic amenity of the area and the quality of visitor experiences. Based on the review, undertake a program to replace damaged and/or missing signage. Uniform sign design including appearance, construction and placement contributes to a recognisable identity for the management authority.

Actions: This option involves replacement of such signage with signage more sympathetic to the area.

Advantages: Reduction of many signage in any particular locations. Replaced signage should be simpler and easy to understand

Disadvantages: Important information/warnings may be lost with replaced signage.

Objectives addressed: PF2

Addressing actions under Manly Council's MSS 2006: C1.3.11 – Interpretive signage at high profile recreational areas

Performance Target: Signage replaced with new ones

Indicative Cost: \$40,000

Time Frame: Between 3-4 years

Responsible Agency: Manly Council – US, NR

Priority: High

Objective

PF.3 Reduce the adverse impacts of features that detract from the visual quality of Manly Cove

PF.3.1 Ensure all new development complies with the landscape provisions of Development Control Plan for Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.

Context: The Development Control Plan (DCP) of the Sydney Regional Environmental Plan - Sydney Harbour Catchments (2005) sets out in detail Council's town planning controls and guidelines on key development factors. In this DCP, different landscape character types in and around Sydney Harbour are recognised. These landscape character types provide a statement of character and intent and sets out performance criteria that are to be met for development within each landscape character types. Landscape character type 8 exists in the Manly Cove CZMP study area.

Type 8 areas have a high level of built form with waterside commercial, industrial and residential uses. The commercial and industrial uses play an important role in terms of tourism and maritime services which support water-based activities. There are special features in these areas that contribute to the visual character of the area that should be maintained.

Actions: The option involves maintenance of special features of Manly Cove.

Objectives addressed: PF3

Addressing actions under Manly Council's MSS 2006: D1.5.2 – ensure livable neighborhoods

Performance Target: Features of the area maintained

Indicative Cost: Staff time

Time Frame: On-going

Responsible Agency: Manly Council –DAU

Priority: High

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4.4 OPTIONS ADDRESSING WATER QUALITY

Water quality in Manly Cove is generally of high standard due to the close proximity to the open ocean and resultant regular tidal flushing of the adjacent waters. However, during periods of heavy rain, water quality is known to be impacted by stormwater delivered from the surrounding sub-catchments. Stormwater transports pollutants settled on roads and building surfaces including organic material, litter, sediments, oil, heavy metals and nutrients. These pollutants are piped into Sydney Harbour and diluted by tidal movements and wave action.

Goal

To ensure water quality meets the community's expectations and falls within acceptable standards suitable for fishing and swimming.

A total of eight management options are proposed addressing three different objectives. Of these, six management options have been rated as of high priority and the remaining two as medium priority. One option is proposed for immediate implementation. Three management options are already on-going activities.

Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
WQ.1 Initiate and implement structured programme for water quality improvement	WQ.1.1 Formulate a comprehensive Stormwater Management Plan for Manly LGA encompassing the study area	5 th year	H(7), M(0), L(1)	High
	WQ.1.2 Identify and implement opportunities for stormwater treatment, harvesting and reuse within Manly Cove	Between 3-4 years	H(5), M(2), L(1)	High
	WQ.1.3 Review cleaning routine of existing GPTs within Manly Cove and assess feasibility of installing a new GPT (Gross Pollutant Trap)	Immediate	H(7), M(1), L(0)	High
WQ.2 Encourage a reduction of effluent discharge/ exfiltration from sewerage infrastructure in the Manly Cove study area	WQ.2.1 Continue to liaise with Sydney Water to ensure that all sewage overflows (and pumping stations) operate within established licensing requirements	On-going	H(7), M(1), L(0)	High
	WQ.2.2 Continue to Implement <i>Manly Council Dry Weather Sewer Leak Investigation and Rectification Program in Manly</i> , to identify sewer leaks from private or Sydney Water sewers where they enter Council's stormwater system	On-going	H(7), M(1), L(0)	High
WQ.3 Ensure sustainable groundwater extraction practices	WQ.3.1 Undertake a comprehensive study on the Manly Cove aquifer to identify recharge volumes and to ensure sustainable extraction rates	Between 3-4 years	H(3), M(2), L(3)	Medium

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Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
to avoid negatively impacting upon aquifer recharge and quality	WQ.3.2 Monitor council bores for salinity and other parameters to ensure extraction does not lead to contamination	Within 2 years	H(2), M(4), L(2)	Medium
	WQ.3.3 Ensure Council staff working with or assessing groundwater issues are familiar with the SCCG Groundwater Management Handbook 2006	On-going	H(5), M(2), L(1)	High

*After adoption of the CZMP

DETAILS OF MANAGEMENT OPTIONS

Objective

WQ.1 Initiate and implement structured programme for water quality improvement.

WQ.1.1 Formulate a comprehensive Stormwater Management Plan for Manly LGA encompassing the study area

Context: This option involves formulation of a comprehensive Stormwater Management Plan for the Manly LGA. The Plan should contain detailed information on existing catchment conditions, stormwater management objectives, existing stormwater management, potential stormwater management options, evaluation of management options, adopted management plan and implementation. Community consultation is an important requirement in developing this plan.

Recommendations from Middle Harbour Catchment Stormwater Management Plan (Willing & Partners 1999) and Northern Beaches Stormwater Management Plan (Patterson Britton & Partners 1999) will be reviewed.

In the comprehensive plan, among others, emphasis should be placed to amend Council's planning instruments and policies to ensure that water sensitive urban design principles are incorporated into the design of all development proposals and works programs within the catchment

Actions:

- Review earlier Management Plans & recent modelling study
- Carry out a community consultation program
- Rerun the model with latest available data
- Liaise with the Sydney Water
- Formulation of the Report

Advantages: Provides a holistic approach to stormwater management of the area. The report will provide more structured and prioritized actions considering all options. The Plan contributes to cost savings for piecemeal efforts.

Disadvantages: Plan preparation is time consuming and costly. Value of the Plan is lost if not implemented readily. Funding may not be available for implementation of priority actions.

Objectives addressed:

Addressing NRC targets (State Plan 2010): 9 – improvement in estuaries ecosystems

Addressing SMCMA catchment targets: CTW3 – progress towards achieving water quality; CTECM1 – improvement in the condition of estuaries

Performance Target: Management plan completed

Indicative Cost: \$ 70,000

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Time Frame: 5th year
Responsible Agency: Manly Council – NR (Water Cycle Management Team)
Priority: High

WQ.1.2 Identify and implement opportunities for stormwater treatment, harvesting and reuse within Manly Cove

Context: Stormwater harvesting involves the collection and reuse of rainwater entering the stormwater drainage system, which would otherwise end up in the ocean. In urban areas, rain that falls on the roof of the house, or collects on paved areas like driveways, roads and footpaths is carried away through a system of pipes that is separate from the sewerage system. This complements other urban local or household management practices such as greywater reuse systems, water recycling and the use of rainwater tanks.

DECCW (now OEH) has developed a guideline 'Managing urban stormwater: harvesting and reuse'. This presents an overview of stormwater harvesting and its potential benefits and limitations. It also provides guidance on the planning and design aspects of stormwater harvesting projects, taking into account statutory and regulatory requirements.

Actions:

- Identify opportunities through new and existing programs
- Seek for external funding
- Implement

Advantages: The main benefits from a successful stormwater reuse scheme are reductions in:

- demand for mains water
- stormwater volumes, flows and the frequency of run-off
- stormwater pollution loads to downstream waterways.

Disadvantages:-

Objectives addressed: WQ1

Addressing NRC targets (State Plan 2010): 9 – improvement in estuaries ecosystems

Addressing SMCMA catchment targets: CTW3 – progress towards achieving water quality; CTECM1 – improvement in the condition of estuaries

Performance Target: Stormwater is reused

Indicative Cost: \$ 30,000 (for identification and concept design). Project implementation: Subject to detailed design.

Time Frame: To be implemented between 3-4 years

Responsible Agency: Manly Council – Natural Resources (Water Cycle Management Team)

Priority: High

WQ.1.3 Review cleaning routine of existing GPTs within Manly Cove and assess feasibility of installing a new GPT (Gross Pollutant Trap)

Context: Stormwater quality varies dramatically not only within different parts of the catchment but also in any given storm event. This high degree of variability makes stormwater treatment a challenge. The physical, chemical and biological processes of stormwater systems and their interactions with pollutants are complex. A number of pollutants are typically found in stormwater runoff generated from urbanised catchments. These pollutants originate from either point or non-point sources. Point sources are specific and identifiable locations where stormwater pollution can occur such as illegal discharges of trade wastes and sewer overflows.

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It usually takes a number of years for source control strategies to become effective and hence to prevent further degradation of the environment, source controls need to be combined with treatment devices such as gross pollutant traps, oil/grit separators, sediment traps and mini wetlands where suitable.

There are 14 GPTs installed throughout Manly LGA. There are two located within Manly Cove in East Esplanade Reserve opposite Ashburner Street and Osborne Road.

Installation of a third GPT is being discussed at the outfall of sub-catchment, MA12.

Actions:

- Review of the cleaning routine of existing GPTs.
- Ensure regular cleaning of existing GPTs.
- Identify location of a third GPT at the outfall of sub-catchment, MA12
- Seek for external funding
- Implement

Advantages: *Installing a new GPT within the catchment would reduce the catchment-based pollutant loads to the bay. As the study area is only a small part of the bay, benefits would be more localized. Improvements to the water quality could be expected. This would in turn improve the aquatic habitat, possibly resulting in more abundant or diverse aquatic fauna. Improved water quality would also increase the recreational amenity of the bay.*

Disadvantages: *Increased cost; both as large capital cost and on-going maintenance costs. Cannot be implemented if funding is not secured. If GPTs are not adequately maintained (cleaned) they can serve as pollutant sources.*

Objectives addressed: WQ1

Addressing NRC targets (State Plan 2010): 9 – improvement in estuaries ecosystems

Addressing SMCMA catchment targets: CTW3 – progress towards achieving water quality

Performance Target: GPT installed

Indicative Cost: \$ 60,000

Time Frame: Immediate

Responsible Agency: Manly Council – Natural Resources (Water Cycle Management Team)

Priority: High

Objective

WQ.2 Encourage a reduction of effluent discharge/ exfiltration from sewerage infrastructure in the Manly Cove study area.

WQ.2.1 Continue to liaise with Sydney Water to ensure that all sewage overflows (and pumping stations) operate within established licensing requirements

Context: *There are presently four sewerage overflow points within the Manly Cove study area, all of which have the potential to significantly impact upon local water quality and the sensitive marine environs of Manly Cove and the North Harbour Aquatic Reserve. The wet weather performances of the four overflows are given in Table 5.13.5. The results are based on a 10 year rainfall time series as identified in Sydney Waters Sewerage Catchment Asset Management Planning (SCAMP) - Needs Assessment Report (2002).*

Table 5.13.5 - Wet weather performance of the four overflows within Manly Cove study area

Overflow Id	Overflow Location	Overflow frequency (events/10 yrs)
SMAS40F01	Directed overflow at corner of East Esplanade and Stuart Street	48*
SP117OF01	Directed overflow at corner of Cove and Stuart Street	2
SP306OF01	Directed overflow at corner of East Esplanade and Ashburner Street	0
SNAS40F01	Directed overflow at corner of Cove and Stuart Street	0

*With a new approach, Sydney Water determined overflow events as 17. This new figure is within the licensing parameters.

Two Sewage Pumping Stations exist within the Manly Cove study area, SP0117 located at 3 Oyama Avenue and SP0306 in East Esplanade Park opposite Ashburner Street. Sewerage Pumping Station 306 was identified as not providing sufficient emergency dry weather containment of overflow in the event of pumping station failure.

Sydney Water is required by OEH licence conditions to manage sewerage treatment systems efficiently. This is required to protect and minimise harm to the environment and public health from sewage treatment plant effluent and sewage overflows by minimising the frequency and volume of sewage treatment plant bypasses and sewage overflows.

Sydney Water is currently implementing detailed sewerage planning programs across Sydney, through the development of SCAMPs or Sewerage Catchment Asset Management Plans. This integrated sewerage system planning tool aims to enable Sydney Water to programme its capital expenditure to meet existing and future catchment performance standards as defined by the Environmental Protection Licences issued by the OEH.

Actions:

- Continue to liaise with Sydney Water.
- Council also collect water samples after rain and test for faecal pollution and enterococci
- Seek information on performances of overflow points and pumping stations
- Erect large warning signs alerting the public to the health hazards
- Discuss remedial measures, if needed.

Advantages: Continuous liaison with Sydney Water will ensure positive results for the study area. This could initiate works by Sydney Water that would result in a reduction of pollutant loads to the bay.

Disadvantages: There are no disadvantages identified

Objectives addressed: WQ2

Addressing SMCMA catchment targets: CTW3 – progress towards achieving water quality

Performance Target: All overflow points and pumping stations operate within performance standard

Indicative Cost: Staff time

Time Frame: on-going

Responsible Agency: Sydney Water, Manly Council – Natural Resources (Water Cycle Management Team)

Priority: High

WQ.2.2 Continue to Implement Manly Council Dry Weather Sewer Leak Investigation and Rectification Program in Manly, to identify sewer leaks from private or Sydney Water sewers where they enter Council's stormwater system.

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Context: Dry weather leakages from both private sewer connections and Sydney Water sewers are important sources of pollution. Since 2008 Council has implemented a successful dry weather sewer leak investigation and rectification program across the LGA to identify these sources of pollution (Ref: Water Cycle Management Team). Given Council's stormwater networks are typically a key means of conveyance of dry weather sewer leaks to recreational waterways, the program focuses on stormwater assets rather than sewer assets.

Actions:

- Program undertaken in dry weather (min no rain in previous 24 hours, less than 5mm in previous 72 hours). Program preferably undertaken at times of peak sewer flow (e.g. 8.00 am on weekdays) and low tide.
- All stormwater pipes discharging to waterways visited and checked for dry weather flow. The rate and volume of water flow estimated and recorded.
- Where stormwater flow exists, field testing undertaken using colorimetric field test for Ammonia (note – provides detection limit of 0.1 mg/L; for Reference, raw sewage is between 12-45 mg/L ammonia; Metcalf and Eddy, 2003). This allows for detection of even trace amounts of dry weather sewage leaking into stormwater.
- Where ammonia is detected (i.e. >0.1 mg/L), water samples are collected, and tested by a NATA Accredited laboratory for faecal indicator bacteria (thermotolerant coliforms / *Escherichia coli*, or faecal streptococci / enterococci) for additional confirmation. Sample collection is undertaken using laboratory bacterial sampling bottles, samples stored immediately in the dark and on ice, and forwarded the same day to the laboratory for culture. (note – for Reference – raw sewage may contain 10^5 - 10^{10} E.Coli CFU /100mL and 10^6 – 10^7 intestinal enterococci CFU/100mL – ARMCANZ/ANZECC, 1997 and NRMCC/EPHC/AHMC, 2006; whilst guidelines define suitability of recreational waterways for primary contact, such as swimming, as median coliform (CFU) densities from 5 samples of at or below 150 CFU/100mL for thermotolerant coliforms / E.Coli, and 35 CFU/100mL for enterococci – NSW DECCW, 2009 Beachwatch).
- Elevated indicator bacterial levels from any stormwater discharge point, should direct allocation of additional investigatory resources. A cost-effective approach is source tracking and tracing up the stormwater network by Local Government officers in partnership with the sewer utility. This comprises a catchment walk, and sampling (in dry weather) from stormwater assets with a pipe network map, at junctions travelling up the network (typically sampling from manholes), with colorimetric ammonia testing and/or faecal indicator analysis, to isolate sewer leaks to a defined area.

Advantages: The program can realise substantial and ongoing benefits from successful sewer leak identifications and rectifications, given commonly low sewer asset failure rates. Substantial benefits available through a partnership between Local Government and the Sewer Utility, include potential cost sharing, and access to additional tools available to the sewer utility once an approximate sewer leak location is suspected (CCTV of sewers, fluorescent dye injection, smoke testing, sewer manhole entry) to pinpoint a fault to either private property or the utility's asset, for rectification.

Disadvantages: potentially labour intensive

Objectives addressed: WQ2

Addressing NRC targets (State Plan 2010): 6 – improvement in the ability of groundwater systems

Addressing SMCMA catchment targets: CTW3 – progress towards achieving water quality

Performance Target: Dry Weather Sewer Leak Investigation and rectification program ongoing

Indicative Cost: \$25,000 (\$5,000/yr)

Time Frame: Underway and ongoing

Responsible Agency: Manly Council- Natural Resources (Water Cycle Management Team)

Priority: High

Objective

WQ.3 Ensure sustainable groundwater extraction practices to avoid negatively impacting upon aquifer recharge and quality.

WQ.3.1 Undertake a comprehensive study on the Manly Cove aquifer to identify recharge volumes and to ensure sustainable extraction rates

Context: Groundwater is an attractive and viable alternate water source for irrigation of public and private land. However, groundwater is not an endless resource, and care needs to be taken to ensure that extraction rates are sustainable. Manly Council drilled a number of test bores within the Manly Cove study area in attempt to identify sustainable sources of groundwater for irrigation purposes. Council constructed a water storage sump adjacent to the Manly Art Gallery in West Esplanade Reserve during 2006. The sump collects groundwater from a year round surface discharge point. This source, combined with rainwater from the Art Gallery roof collected in a rainwater tank, provides for the irrigation requirements for West Esplanade Reserve.



Following a thorough testing procedure, a bore was also drilled in East Esplanade Reserve during August 2005 for the purpose of irrigating the portion of the Reserve east of Manly Wharf to Manly 16 Foot Skiff Club. The bore intercepts the water table at a depth of 3.5 m and extracts ground water from a depth of 5.8 metres. The bore provides sufficient water for local irrigation usage.

As the groundwater is applied to parklands directly over the aquifer from which it was extracted, it also serves a recharge function. Groundwater testing since 2005 has shown that water quality is very good and well within the parameters set for irrigation requirements.

A comprehensive investigation will be undertaken, in conjunction with the NSW Office of Water, to measure total extraction and recharge rates of the aquifer at Manly Cove (and potentially other areas, if required), to determine if the current yields are sustainable.

Actions:

- Liaise with the NSW Office of Water.
- Carry out a comprehensive investigation to measure total extraction and recharge rates of the aquifer at Manly Cove (and potentially other areas, if required).
- Determine that the current yields are sustainable.

Advantages: Will provide valuable information on groundwater extraction and recharge. This will contribute to an understanding of sustainable groundwater use.

Disadvantages: There are no apparent disadvantages

Objectives addressed: WQ3

Addressing NRC targets (State Plan 2010): 6 – improvement in the ability of groundwater systems

Addressing SMCMA catchment targets: CTW3 – progress towards achieving water quality; CTW4 - improvement in the quality and sustainable use of groundwater

Addressing actions under Manly Council's MSS 2006: C1.1.24 – groundwater extraction and recharge monitoring

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Performance Target: Study report completed
Indicative Cost: \$40,000, it is likely that the study will be combined with a regional groundwater study for cost efficiency.
Time Frame: Between 3-4 years
Responsible Agency: Manly Council – Natural Resources (Water Cycle Management Team), Office of Water
Priority: Medium

WQ.3.2 Monitor council bores for salinity and other parameters to ensure extraction does not lead to contamination

Context: With recent droughts, groundwater has become an attractive and viable alternate water source for irrigation of public reserves. Excessive groundwater abstraction, from bores so close to the estuary, can lead to sea water intruding into the freshwater aquifer.

Actions:

- Monitor salinity levels fortnightly by measuring Electrical Conductivity (EC) in micro siemens per centimetre ($\mu\text{S}/\text{cm}$) using an ECScan Low meter. Salinity levels (EC) in freshwater range from 0 to 800 $\mu\text{S}/\text{cm}$ and brackish water ranges from 1600 to 4800 $\mu\text{S}/\text{cm}$. Truly saline waters have levels greater than 4800 $\mu\text{S}/\text{cm}$ and seawater is approximately 56000 $\mu\text{S}/\text{cm}$.
- Monitor other parameters as considered as appropriate.
- Analyse results for any sign of early contamination and to indicate a trend and/or seasonal variation
- Take necessary remedial measures if a trend of increasing salinity is detected.

Advantages: Will provide valuable information on early sign of groundwater salinity and indications of seawater intrusion in freshwater aquifer.

Disadvantages: There are no apparent disadvantages

Objectives addressed: WQ3

Addressing NRC targets (State Plan 2010): 6 – improvement in the ability of groundwater systems

Addressing SMCMA catchment targets: CTW3 – progress towards achieving water quality; CTW4 - improvement in the quality and sustainable use of groundwater

Addressing actions under Manly Council's MSS 2006: C1.1.24 – groundwater extraction and recharge monitoring

Performance Target: Salinity & other parameters monitored
Indicative Cost: \$ 10,000
Time Frame: To be implemented within 2 years
Responsible Agency: Manly Council – Natural Resources (Water Cycle Management Team)
Priority: Medium

WQ.3.3 Ensure Council staff working with or assessing groundwater issues are familiar with the SCCG Groundwater Management Handbook 2006

Context: In 2006, the Sydney Coastal Council Group has developed the Groundwater Management Handbook as a guide for Local Government. This document is intended as a guidance manual to assist Council staff and the community in understanding how groundwater occurs and the processes by which impacts upon it are managed. Many Development Applications have the potential to impact on groundwater, either through changes to flow patterns or quality, and this is often not apparent until after the project is completed. In certain cases, by not fully assessing groundwater impacts, there has been a substantial financial burden incurred to overcome the results of poor development practices. The Handbook:

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- provides background information on groundwater occurrence and behaviour
- describes groundwater environments within the SCCG region
- provides an assessment of current legislation in relation to groundwater management
- provides technical advice on the management of groundwater
- identifies the information available from the groundwater database maintained by the Office of Water (NSW Department of Primary Industries)

Actions:

- Copies of the Handbook are made available to relevant sections of the Council
- The Handbook is used as a guide during DA assessments.

Advantages: Will provide valuable information to assess groundwater impacts

Disadvantages: There are no apparent disadvantages

Objectives addressed: WQ3

Addressing NRC targets (State Plan 2010): 6 – improvement in the ability of groundwater systems

Addressing SMCMA catchment targets: CTW3 – progress towards achieving water quality; CTW4 - improvement in the quality and sustainable use of groundwater

Addressing actions under Manly Council's MSS 2006: C1.1.24 – groundwater extraction and recharge monitoring

Performance Target: SCCG Handbook is used

Indicative Cost: Staff time

Time Frame: On-going

Responsible Agency: Manly Council – Natural Resources, Environmental Health, DAU

Priority: High

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4.5 OPTIONS ADDRESSING TERRESTRIAL ECOSYSTEM

Fragmentation, clearance and degradation of native vegetation in the Manly Cove study area have reduced habitat value for native fauna. Small pockets of remnant bushland do exist between Oceanworld and Federation Point and on Manly Point, providing important habitat for the endangered colony of Little Penguins (*Eudyptula minor*). Grassed areas within the study area are also known to provide nesting and foraging habitat for the endangered North Head population of Long-nosed Bandicoots (*Perameles nasuta*). There is need to protect and regenerate the areas of bushland still intact, in order to support the development of flora and fauna in these areas.

Goal

To conserve and enhance the integrity and diversity of native terrestrial flora and fauna, and their ecosystems.

A total of six management options are proposed addressing two different objectives. Of these, four management options have been rated as of high priority and the remaining two as medium priority. All management options are already on-going activities of Council.

Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
TE.1 To ensure the activities within Manly Cove are carried out in a manner that maintain or improve the ecological condition of terrestrial habitats and species and also support objectives of Biodiversity Strategy	TE.1.1 Maintain and enhance remnant vegetation at Manly Point and Federation Point to improve on the habitat for the Little penguin population	On-going	H(5), M(3), L(0)	High
	TE.1.2 Encourage planting of native flora species on private and public lands to provide improved potential foraging and nesting habitat for the Long-nosed Bandicoot	On-going	H(3), M(4), L(1)	Medium
	TE.1.3 Ensure that Council's Street Tree Planting Program results in the planting of appropriate native species	On-going	H(4), M(2), L(2)	High
	TE.1.4 Continue work with OEH to manage Little Penguin Critical Habitat, the Wildlife Protection Area at Federation Point and known nesting sites in line with the Manly Little Penguin Recovery Plan.	On-going	H(6), M(2), L(0)	High
	TE1.5 Continue enhanced weeding program at high weed density areas on a priority basis.	On-going	-	Medium
TE.2 To achieve community awareness of and involvement in the conservation of terrestrial ecology through education and participation	TE.2.1 Continue to provide community education in line with actions identified in the Manly Little Penguin Recovery Plan and Draft Long-nosed Bandicoot Recovery Plan.	On-going	H(6), M(2), L(0)	High

*After adoption of the CZMP

MANLY COVE COASTAL ZONE MANAGEMENT PLAN

DETAILS OF MANAGEMENT OPTIONS

Objective

TE.1 To ensure the activities within Manly Cove are carried out in a manner that maintain or improve the ecological condition of terrestrial habitats and species.

TE.1.1 Maintain and enhance remnant vegetation at Manly Point and Federation Point to improve on the habitat for the Little Penguin population

Context: Penguin Critical Habitat B exists around Manly Point extending from 11A Oyama Avenue to 26 Addison Road. Penguin nesting sites have also been identified in the area of foreshore between Federation Point and Oceanworld which was declared a Wildlife Protection Area.

Skelton et al. (2004) identified that there is little remnant bushland at and around Manly Point. The fragmentation of natural bushland areas in Manly has reduced the viability of habitat in many bushland reserves to support populations of native fauna. However, remnant vegetation on Manly Point forms part of the important Critical Habitat area for Manly's Little Penguin population with numerous burrows located at this location.

It was suggested during the consultation process that remnant bushlands are often damaged by nearby residents.

When undertaking bush regeneration within the study area, it is important to take into consideration the critical habitat declared for this area. Bush regeneration must be done gradually to ensure the impact on habitat is minimal, and must be done in accordance with OHE license requirements. This also applies to weed control undertaken on private property that occurs within critical habitat areas. Banning of rock fishing may be considered in the area.

Actions:

- Survey and map the remnant bushland at the Penguin Critical Habitat, Manly Point and Wildlife Protected Area at Federation Point.
- Undertake an educational Program for nearby residents on the value of remnant bushlands
- Undertake management practices as per Council's adopted approach
- Undertake cautionary approach in managing this remnant vegetation

Objectives addressed: TE1

Addressing actions under Manly Council's MSS 2006: C1.6.17 – actively police breaches of Tree Preservation Order

Addressing SMCMA catchment targets: CTB1 – extent and condition of terrestrial native vegetation is improved; CTB3 – increase in the connectivity of terrestrial native vegetation

Addressing NRC targets (State Plan 2010): 1 – improvement in native vegetation condition

Performance Target: Remnant vegetation maintained

Indicative Cost: Volunteer time

Time Frame: On-going

Responsible Agency: Manly Council-Parks & Bushlands

Priority: High

TE.1.2 Encourage planting of native flora species on private and public lands to provide improved potential foraging and nesting habitat for the Long-nosed Bandicoot

Context: The long-nosed Bandicoot nests and forages within the study area, where there is some suitable nesting (thickets of low dense vegetation) and foraging habitat (grassland, including lawns). The population of long-nosed Bandicoots (*Perameles nasuta*) at North Head is listed as endangered on Schedule 1 of the Threatened Species Conservation Act 1995 (TSC Act).

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Revegetation of parts of Manly Cove Reserve and Beach to create nesting habitat for the Long Nosed Bandicoots is proposed. Increasing the amount of nesting and foraging habitat for this species will allow for a potential increase in the size of the population.

Actions:

- Identify lands, both public and private, for potential foraging
- Encourage private land owners to participate in habitat restoration
- Undertake programs to plant low dense clumping native flora species and also flowering shrubs/bushy plants

Objectives addressed: TE1

Addressing SMCMA catchment targets: CTB1 – extent and condition of terrestrial native vegetation is improved; CTB3 – increase in the connectivity of terrestrial native vegetation

Addressing NRC targets (State Plan 2010): 1 – improvement in native vegetation condition

Performance Target: Native vegetation maintained and enhanced

Indicative Cost: \$15,000 (\$3,000 per year)

Time Frame: On-going

Responsible Agency: Manly Council-Parks & Bushlands

Priority: Medium

TE.1.3 Ensure that Council's Street Tree Planting Program results in the planting of appropriate native species

Context: Manly Council's policy is to maintain the attractiveness, appeal and amenity of the area by preserving healthy trees in recognition of the value and importance of trees held by the community. Trees play an important part in maintaining the health of our environment, they help to protect soil and water supplies, provide shade, provide habitat, food, shelter and protection for wildlife. Trees in urban areas act as extensions of and links between core bushland, also known as bushland corridors.

Consider not to use *Cyprus* spp. as they grow too tall. Always replace any tree with native trees.

The Manly Council Tree Preservation Order 2001 applies to all trees in the Manly LGA. It is illegal to remove or prune any trees on public land, parks, bushland reserves or foreshore areas.

Consider reviewing the landscape section of the 1986 Manly Heritage Study for background into any culturally significant tree plantings in the area; and conserve and enhance any existing listed street tree plantings.

Actions:

- Review the present program of tree plantation
- Develop a comprehensive list of site specific recommended and appropriate trees
- Accommodate view eminence by selecting suitable plant type. Consider not to use *Cyprus* spp. Consider trees that provide shade and attract birds.

Objectives addressed: TE1

Addressing actions under Manly Council's MSS 2006: C1.6.17 – actively police breaches of Tree Preservation Order

Addressing SMCMA catchment targets: CTB1 – extent and condition of terrestrial native vegetation is improved; CTB3 – increase in the connectivity of terrestrial native vegetation

Addressing NRC targets (State Plan 2010): 1 – improvement in native vegetation condition

Performance Target: Recommended list prepared & program continued

Indicative Cost: \$50,000 (\$10,000 per year)

Time Frame: On-going

Responsible Agency: Manly Council-Parks & Bushlands

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Priority: High

TE.1.4 Continue work with OEH to manage Little Penguin Critical Habitat, the Wildlife Protection Area at Federation Point and known nesting sites in line with the Manly Little Penguin Recovery Plan.

Context: A small colony of Little Penguin has nested at Federation Point east along the foreshore behind Manly Pier. For the conservation of Manly's endangered population of Little Penguins, Council designated the foreshore area of Federation Point a Wildlife Protection Area (WPA). Administered under the Companion Animals Act 1998, the designation of the WPA precludes dogs and cats from the foreshore. To coincide with the designation of the WPA the stairs and boardwalk/walkway around to Ocean World has been made a dog 'on leash area'. Recently, some areas have been designated as 'dog prohibited area'. Signage has also been installed. Recent renovations and changes in use of the Bather's Pavilion, as has been assessed, are likely to pose threats to wildlife and habitats in the area.

Penguin site at Federation Point is not shown on Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.

Actions:

- support continuation of the WPA.
- support increased Penguin Wardens to patrol the area
- improve educational/interpretive signage: much bigger, penguin specific signage painted on the path at several points (e.g. at Federation Point & at start of WPA) – perhaps a penguin with a speech bubble.
- Indicate a contact number on signage that the public may ring if they discover injured or at risk penguin.
- Interact with DoP and OEH to update its maps to show Penguin habitat at Federation Point & the Wharf & to gain "critical habitat" protection.
- Protect Federation Point nesting sites by fencing to provide barrier to people, fisherman and dogs
- Install CCTV at Federation Point to monitor nesting sites

Advantages: Little Penguin habitat protected and population size increased.

Disadvantages:

Objectives addressed: TE1

Addressing actions under Manly Council's MSS 2006: C1.2.17 – enforce restrictions near Penguin Critical Habitat

Addressing SMCMA catchment targets: CTB4 – terrestrial threatened species are better conserved

Addressing NRC targets (State Plan 2010): 2 – native fauna species; 3 – threatened species, populations and ecological communities

Performance Target: WPA maintained and continued

Indicative Cost: Staff & Warden time

Time Frame: On-going

Responsible Agency: Manly Council – Natural Resources, Precincts

Priority: High

TH 1.5. Continue enhanced weeding program at high weed density areas on a priority basis.

Context: There are 139 weed species recorded within the study area. These species have reached bushland areas by escaping from gardens, illegal dumping of garden refuses, dispersion by fauna (e.g. - birds eating seeds) and illegal plantings. Asparagus fern and other invasive species are widespread in the area between the Art Gallery and Federation Point. Weed management will involve seasonally prioritised strategies.

Actions:

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- Control weeds using appropriate bush regeneration methods to minimise disturbance to the environment. Use methods that do not risk water contamination or harm to Penguins and their habitat
- Take steps to prevent dispersal of weeds
- Follow Weed Management Strategy 2007-11 for Sydney Metropolitan CMA.

Advantages: *Contributes in healthy native vegetation*

Disadvantages: *Labour intensive, must ensure sufficient maintenance*

Objectives addressed: TH1

Addressing actions under Manly Council's MSS 2006: C1.5.10 – implement weed control; C1.6.1 – implement Weed Management Strategy;

Addressing SMCMA catchment targets: CTB1 – extent and condition of terrestrial native vegetation is improved; CTB5 – impact of terrestrial invasive species is reduced

Addressing NRC targets (State Plan 2010): 4 – reduction in the impact of invasive species

Performance Target: Weed density lowered

Indicative Cost: \$3,000 per year

Time Frame: On-going

Responsible Agency: Manly Council – Parks & Bushlands

Priority: -

Objective

TE.2 To achieve community awareness of and involvement in the conservation of terrestrial ecology through education and participation.

TE.2.1 Continue to provide community education in line with actions identified in the Manly Little Penguin Recovery Plan and Draft Long-nosed Bandicoot Recovery Plan.

Context: *The Manly Little Penguin and draft Long-nosed Bandicoot Recovery Plans have identified actions for community education. The purpose is to encourage and maintain public awareness and participation in the recovery and management.*

Action: *The option involves encouraging wider community participation in implementing Recovery Plans:*

- *developing and implementing an education program for the residents to emphasise the significance of these populations occurring on or adjacent to their properties,*
- *ensuring that progress and information as a result of the implementation of these recovery plans are readily available to the community*
- *The community is informed of the management and is actively involved in implementing actions that directly improve the status of the population, and provide information to assist land managers in their knowledge and understanding of the population's management.*

Objectives addressed: TE2

Addressing actions under Manly Council's MSS 2006: C1.2.6 – residents involvement in voluntary ranger program

Addressing SMCMA catchment targets: CTB1 – extent and condition of terrestrial native vegetation is improved; CTC1 – communities engaged in improved natural resource management; CTC4 – community recognising the contribution of healthy natural resources

Addressing NRC targets (State Plan 2010): 1 – improvement in native vegetation condition; 4 – reduction in the impact of invasive species

Performance Target: *Recovery Plans are supported with increased community participation*

Indicative Cost: Staff time

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Time Frame: On-going
Responsible Agency: Manly Council- Environmental Partnerships & Programs, Parks & Bushlands
Priority: High

Goal

Assess, monitor and mitigate risks from coastline hazards and climate change.

4.6 OPTIONS ADDRESSING CLIMATE CHANGE & COASTAL HAZARDS

Manly Cove faces a number of coastline hazards including beach erosion, shoreline recession, sand drift, inundation, stormwater erosion and slope & cliff instability. Each of these hazard types has been assessed and a range of management responses identified.

Manly Cove is also expected to be affected from sea level rise impacts. The NSW Government has in 2009 released the Sea Level Rise Policy Statement which provides guidance on sea level projections through the adoption of benchmarks for a rise relative to 1990 mean sea levels of 40 cm by 2050 and 90 cm by 2100.

The primary objective of this Sea Level Rise Policy Statement is to minimise the social disruption, economic costs and environmental impacts resulting from long-term sea level rise. The NSW Government has also prepared guideline documents, legislative amendments to support the Policy Statement.

A total of 14 management options are proposed addressing five different objectives. Of these, five management options have been rated as of high priority; eight have medium priority and the remaining one as having low priority. One option is proposed for immediate implementation. Eight management options are already on-going activities of Council.

Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
CH.1 To reduce to an acceptable level, the risk to property and infrastructure resulting from Sea Level Rise	CH.1.1 Establish 'coastal risk areas' using NSW's planning sea level rise benchmarks	Immediate	H(3), M(3), L (3)	Medium
	CH.1.2 Ensure appropriate development on land identified as 'coastal risk areas'	On-going	H(5), M(2), L (2)	High
	CH.1.3 Adopt an adaptive risk-based approach to managing climate change including sea level rise impacts	On-going	H(1), M(5), L (3)	Medium
	CH.1.4 Work with regional, state and federal bodies to ensure consistent adaptation planning	On-going	H(1), M(4), L (4)	Medium
	CH.1.5 Work within the emergency management frameworks identified in Local Emergency Management systems during times of floods and storms	On-going	H(7), M(1), L (1)	High
CH.2 Promote understanding of the likely environmental,	CH.2.1 Continue to provide updated information to the public about climate change including sea level rise and their impacts	On-going	H(1), M(4), L (2)	Medium

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Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
social and economic impacts of climate change	CH.2.2 Incorporate latest climate change information into management decisions	Within 2 years	H(3), M(4), L (2)	Medium
CH.3 Reduce to an acceptable level, the risk of damage as a result of beach erosion and shoreline recession	CH.3.1 Develop and implement a natural shoreline and shoreline structure monitoring program for Manly Cove East and West Beaches	Within 2 years	H(5), M(4), L (0)	High
	CH.3.2 Consider beach nourishment to reduce the risk from beach erosion	5 th year	H(3), M(4), L (2)	Medium
	CH.3.3 Should the risk of damage to the existing seawall due to the effects of beach erosion and recession in the future become unacceptable, evaluate and implement the available management options	On-going	H(2), M(6), L (1)	Medium
CH.4 To reduce to an acceptable level, the risk to property and risk to life as a result of slope and cliff instability	CH.4.1 Continue the staged remediation of cliff and slope instability on public lands based upon the level of risk posed to life and /or property and in line with recommendations of the Davis Marina to Manly Point CHDS	On-going	H(3), M(4), L (2)	Medium
	CH.4.2 Reissue notifications to private property owners of identified coastal hazards potentially affecting their land and a reminder the information has been recorded on the properties S.149 Certificate	On-going	H(5), M(2), L (2)	High
CH.5 Undertake measures to address risk from tsunami	CH.5.1 Map tsunami risk areas	Within 2 years	H(3), M(2), L (4)	Low
	CH.5.2 Identify, with SES, emergency measures including evacuation routes in tsunami risk areas.	Between 3-4 years	H(5), M(2), L (2)	High

*After adoption of the CZMP

DETAILS OF MANAGEMENT OPTIONS

Objective

CH.1 To reduce to an acceptable level, the risk to property and infrastructure resulting from Sea Level Rise.

CH.1.1 Establish 'coastal risk areas' using NSW's planning sea level rise benchmarks

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Context: The NSW sea level rise planning benchmarks are an increase above 1990 mean sea levels of 40cm by 2050 and 90cm by 2100. Of all the impacts from climate change, the projected rise in mean sea level is one of the most significant concerns for integrated coastal zone management. In addition to higher projected storm surge and oceanic inundation levels, a rise in mean sea level will also result in complementary recession of unconsolidated (sandy) shorelines.

A 'sea level rise planning area' is to be defined in coastal hazard studies, for use in land use planning and development assessment. Future studies will therefore need to include 2100 hazard lines based on defining both a 'coastal hazard planning area' assuming no sea level rise and defining a 2100 hazard line incorporating sea level rise induced recession using the benchmarks. Both sets of lines are now required to be determined and can be defined as 'coastal risk area' for planning purposes. This will ensure consistent consideration of sea level rise in coastal hazard assessment for planning purposes.

Prior to the completion of new or revised studies, councils may adopt investigation areas (potential coastal risk areas) for the purpose of land use planning and development assessment. An investigation area can be used by a council as an interim guide to indicate land likely to be subject to coastal risks now or in the future as a consequence of sea level rise. The sea level rise planning benchmarks should be incorporated into council's calculation of the investigation areas.

Actions:

- Secure external funding to carry out risk assessments to sea level rise
- Establish and adopt sea level rise risk areas
- Make information available to public
- Procure instruments, data and software to carry out such analysis in-house, such as LiDAR data and an updated hydrodynamic model
- Make modelling results and identified risk areas public.

Objectives addressed: CH1

Addressing actions under Manly Council's MSS 2006: C2.4.1 – implement best-practice risk management

Performance Target: Coastal erosion risk areas are identified, mapped and adopted

Indicative Cost: \$120,000

Time Frame: Immediate

Responsible Agency: Manly Council – NR, SLUP

Priority: Medium

CH.1.2 Ensure appropriate development on land identified as 'coastal risk areas'.

Context: As new coastal risk areas are identified, these extended areas of risk will need to be taken into consideration when undertaking strategic planning.

Coastal Planning Principle 3 of the NSW Coastal Planning Guideline: Adapting to Sea level Rise discourages the intensification of development in coastal risk areas. For example, changing land use from rural to urban, or increasing the density of housing from low to medium or high density is strongly discouraged in high risk areas due to the potential future risk to life, property and the environment. New urban centres should be sited away from coastal risk areas.

Coastal Planning Principle 4 encourages the reduction of land use intensity in coastal risk areas where feasible. Reducing land use intensity may be difficult to achieve in areas like Manly that have already undergone significant urban development (e.g. established residential zones). Changing land use zoning from medium density housing to low density or prohibiting new urban development in general would affect the future development potential of a given area. This is particularly the case if the coastal risks are only minor and the future development potential of the land is not otherwise restricted by other environmental, social or economic constraints. Conversely, sea level rise may significantly affect the

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development potential of some areas in the future. Appropriate planning is needed to minimise the social and economic impacts of inappropriate development in the long term.

Actions:

- Establish and adopt sea level rise risk areas
- Assess and revise development potential of sea level rise risk areas
- Use new assessment in approving DA applications

Objectives addressed: CH1

Addressing actions under Manly Council's MSS 2006: C2.4.1 – implement best-practice risk management

Addressing SMCMA catchment targets: CTC5 – adaptive and mitigating strategies for climate change impacts on natural resource values

Performance Target: Appropriate development of coastal risk areas ensured

Indicative Cost: Staff time

Time Frame: on-going

Responsible Agency: Manly Council – SLUP, DAU, NR

Priority: High

CH.1.3 Adopt an adaptive risk-based approach to managing climate change including sea level rise impacts

Context: Manly Council has undertaken a Climate Change Risk Assessment and Adaptation Action Planning Process through the Federal Government's Local Adaptation Pathways Program. Council is building on the outcomes of this process in preparation of a Draft Climate Change Adaptation Strategy (incorporating the prioritised Adaptation Action Plan).

Council is also implementing a few adaptation measures including:

- Improving water-use efficiency, recycling and public education about water usage.
- Developing and gradually implementing coastal zone and estuary management plans.
- Maintaining green spaces (parks and bushland) in urban areas.

Actions:

- Completion of Manly LGA Climate Change Adaptation Strategy (incorporating Adaptation Action Plan).
- Implementation of identified priority adaptation actions
- Modify on-going adaptation measures based on periodic assessment and also accommodating new knowledge
- Identify opportunities to install water and energy efficient systems on public facilities throughout the study area.

Objectives addressed: CH1

Addressing actions under Manly Council's MSS 2006: C2.4.1 – implement best-practice risk management

Addressing SMCMA catchment targets: CTC5 – adaptive and mitigating strategies for climate change impacts on natural resource values

Performance Target: Positive measurable impacts achieved

Indicative Cost: \$70,000

Time Frame: On-going

Responsible Agency: Manly Council – NR, Urban Services, Precincts

Priority: Medium

CH.1.4 Work with regional, state and federal bodies to ensure consistent adaptation planning

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Context: Collaboration with all levels of Government is important to ensure consistent adaptation planning. Under the COAG National Climate Change Adaptation Framework, NSW is participating in an initiative to develop national priorities for adaptation research. This work is being co-ordinated by the Commonwealth's Department of Climate Change and the National Climate Change Adaptation Research Facility, hosted by Griffith University, Queensland.

Local Governments are responding in a number of ways to the problem of climate change. They are working to reduce greenhouse gas emissions by making necessary changes to their activities as well as using their planning powers, spending policies and community and business links to influence households and businesses. The Local Government and Shires Association (LGSA) has developed a Climate Change Action Pack to assist local government to mitigate and adapt to climate change.

Sydney Coastal Councils Group (SCCG) is supporting 15 coastal councils to adopt consistent adaptation planning.

Action: The option involves continuation of collaboration.

Objectives addressed: CH1

Addressing actions under Manly Council's MSS 2006: C2.4.7 – partnership with SCCG for best practice management responses to climate change

Addressing SMCMA catchment targets: CTC2 – improved focus and collaboration between organisations; CTC5 – adaptive and mitigating strategies for climate change impacts on natural resource values

Performance Target: Improved and continued collaboration

Indicative Cost: Staff time

Time Frame: On-going

Responsible Agency: SCCG, OEH, Manly Council- NR, SLUP

Priority: Medium

CH.1.5 Work within the emergency management frameworks identified in Local Emergency Management systems during times of floods and storms

Context: The Manly Warringah Pittwater Local Emergency Management Committee (LEMC) co-ordinates a multi-agency response to local emergencies. The Committee has prepared a local disaster plan called, Manly Warringah Pittwater DISPLAN in August 2005.

The DISPLAN is the key document for identifying roles, responsibilities, control and co-ordination of emergency operations at the local level. This document links with District and State Level Disaster Plans should the scale of the disaster require resources not available within the local community. The DISPLAN can be activated by the Local Emergency Operations Controller (LEOCON). This is currently the Northern Beaches Area Commander of the NSW Police Service. The Committee is chaired by a senior representative of Council, the Local Emergency Management Officer (LEMO).

Actions:

- The DISPLAN is circulated widely.
- Work within the existing framework
- Emergency management framework during times of flood and storm is evaluated

Objectives addressed: CH1

Performance Target: Emergency Action Plan updated

Indicative Cost: \$10,000

Time Frame: on-going

Responsible Agency: Manly Council- Urban Services, Natural Resources; SES

Priority: High

Objective**CH.2 Promote understanding of the likely environmental, social and economic impacts of climate change****CH.2.1 Continue to provide updated information to the public about climate change including sea level rise and their impacts**

Context: Knowledge of possible impacts of climate change is always growing. The community is often confused with information reaching to them from the media. The community needs to receive relevant, accurate and structured information. Precincts can facilitate disseminating information to the community and increase community involvement.

Recently Precincts have been provided with information packages containing NSW Governments Sea Level Rise Policy Statement and NSW Coastal Planning Guidelines.

Actions:

- Prepare a booklet (fact sheet) on key climate change impacts on Manly LGA including information on on-going mitigation and adaptation measures (a combination of Cardno, SCCG and Risk/Mitigation Assessment reports)
- Publish and distribute the booklet through Precincts

Objectives addressed: CH2

Addressing actions under Manly Council's MSS 2006: C2.4.4 – implement climate change education and awareness program

Addressing SMCMA catchment targets: CTC1 – people, communities have increased capacity to engage in improved natural resource management; CTC5 – adaptive and mitigating strategies for climate change impacts on natural resource values

Performance Target: Booklet (fact sheet) published and distributed

Indicative Cost: \$15,000 + Staff time

Time Frame: On-going

Responsible Agency: Manly Council – EPP, NR, MEC, Precincts

Priority: Medium

CH.2.2 Incorporate latest climate change information into management decisions

Context: The NSW Government has last year announced the Coastal Erosion Reform Package and Policy Statement on Sea Level Rise. The Reform Package includes amendments to legislation, new guidelines, and additional support for councils to re-energise their coastal management planning processes. The Sea Level Rise Policy Statement, an element of the Reform package, identifies sea level rise projections of up to 40 cm to 2050, and 90 cm to 2100, for the NSW coastline.

As part of the Reform Package, the Coastal Protection and Other Legislation Amendment Act 2010 was passed by the NSW Parliament on 21 October 2010 and largely commenced on 1 January 2011. This Act amended the Coastal Protection Act, the Local Government Act and the Environmental Planning and Assessment Acts, and three regulations.

The Act is supported by a series of statutory and non-statutory guidelines as:

- Minister's Requirements under the Coastal Protection Act 1979
- Guidelines for preparing coastal zone management plans
- Coastal Protection Service Charge Guidelines

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- A Guide to the Statutory Requirements for Emergency Coastal Protection Works
- A guide for authorised officers under the Coastal Protection Act
- Guidelines for assessing the impacts of seawalls

The Coastal Protection Regulation 2011 and associated Code of Practice under the Act have now been enacted.

It is necessary that these latest climate change directions and requirements are incorporated into management decisions.

Actions:

- *Climate change directions and requirements are incorporated into management decisions.*
- *These directions are publicised widely within the Council*
- *Public Forums are held to explain Government directions and requirements.*

Objectives addressed: CH2

Addressing actions under Manly Council's MSS 2006: C2.4.4 – implement climate change education and awareness program

Addressing SMCMA catchment targets: CTC5 – adaptive and mitigating strategies for climate change impacts on natural resource values

Performance Target: Climate change directions and requirements are publicised widely within the Council

Indicative Cost: staff time

Time Frame: within 2 years

Responsible Agency: Manly Council – NR, SLUP

Priority: Medium

Objective

CH.3 Reduce to an acceptable level, the risk of damage as a result of beach erosion and shoreline recession.

CH.3.1 Develop and implement a natural shoreline and shoreline structure monitoring program for Manly Cove East and West Beaches

Context: Shoreline recession is the progressive landward shift of the average long term position of the coastline. The cause of shoreline recession is sediment loss. Recession of a sandy beach is the result of a long term and continuing net loss of sand from the beach system. According to the sediment budget concept, this occurs when more sand is leaving than entering the beach compartment. Recession tends to occur when, for example:

- The outgoing longshore transport from a beach compartment is greater than the incoming longshore transport;
- Offshore transport processes move sand to offshore "sinks" from which it does not return to the beach; and
- There is a landward loss of sediment by windborne transport.

While it is convenient to express shoreline recession due to sediment loss as a rate (metres per year) the process of recession is not uniform over time but is associated generally with storm activity (PBP, 2004).

Seawalls, boating facilities, Manly Wharf, Oceanworld, Manly Bathers Pavilion and boating clubs are some of the coastal structures located on the shoreline of Manly Cove.

Actions: Implement a regular structural monitoring program and report any signs of damage.

Objectives addressed: CH3

Addressing SMCMA catchment targets: CTC3 – framework for monitoring, evaluating and reporting natural resource indicators

Addressing actions under Manly Council's MSS 2006: C1.3.2 - Monitoring seawall stability

Performance Target: Regular Inspection Report

Indicative Cost: \$ 50,000 (\$10,000 yearly)

Time Frame: Within 2 years

Responsible Agency: Manly Council- Urban Services & NR,

Priority: High

CH.3.2 Consider beach nourishment to reduce the risk from beach erosion

Context: Beach Nourishment is a popular alternative to harden shore protection systems. It involves deliberately enlarging the width and height of a beach through the application of dredged material without the addition of hard structures to the beach.

The current width of Manly Cove West Beach, measured at mean sea level, is approximately 20 m. This beach has shown a recession rate of about 0.05 m/yr which would mean that the beach would reduce in width by 2 to 4 m over a period of 20 to 50 years respectively. On the other hand, Manly Cove East Beach currently has a width, measured at mean sea level, of approximately 15 m. This beach has an increase in sand volumes over a limited study period, primarily due to artificial beach nourishment in 1989, 1991 and 1992. As these are popular beaches, it is necessary to monitor recession due both to storms and sea level rise.

The SCCG has supported a scoping study to develop the outline of a sand nourishment programme for Sydney beaches utilising suitable offshore sand deposits for amenity enhancement and to ameliorate increased hazard risk from sea level rise. The environmental, economic and social evaluations of the nourishment campaign demonstrate substantial positive benefits

The NSW Government have adopted a position prohibiting the commercial extraction of offshore marine sands. It is the intent of the SCCG to press Government to lift this prohibition to facilitate immediate and longer term demands for nourishment purposes in the Greater Metropolitan Region.

Actions:

- Work with the SCCG to facilitate a beach nourishment program
- Support SCCG in pressing Government to lift prohibition of the commercial extraction of offshore marine sands.

Objectives addressed: CH3

Addressing SMCMA catchment targets: CTLD2 – protect and improve key natural resources

Addressing actions under Manly Council's MSS 2006: C1.3.2 - Monitoring seawall stability

Performance Target: Beach nourishment program initiated

Indicative Cost: TBD (External grant will be needed)

Time Frame: 5th year

Responsible Agency: Manly Council- Urban Services & NR; SCCG

Priority: Medium

CH.3.3 Should the risk of damage to the existing seawall due to the effects of beach erosion and recession in the future become unacceptable, evaluate and implement the available management options

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Context: Based on findings of the monitoring program (option CH3.1), regular inspections should be carried out, especially after storms, to assess conditions of seawalls protecting public properties. Site inspections should include, but not necessarily be limited to a visual assessment of the condition of the walls and inspection pits to confirm foundation levels where necessary to determine soil properties of the foundation and backfill material. Appropriate geotechnical analysis will be required to determine the stability of the seawall's under design scour conditions.

Actions: This option involves regular inspection of seawalls, especially after storms.

Objectives addressed: CH3

Addressing actions under Manly Council's MSS 2006: C1.3.2 - Monitoring seawall stability

Performance Target: Regular Inspection Report

Indicative Cost: Staff cost

Time Frame: on-going

Responsible Agency: Manly Council- Urban Services & NR

Priority: Medium

Objective

CH.4 To reduce to an acceptable level, the risk to property and risk to life as a result of slope and cliff instability.

CH.4.1 Continue the staged remediation of cliff and slope instability on public lands based upon the level of risk posed to life and /or property and in line with recommendations of the Davis Marina to Manly Point CHDS

Context: A Hazard Definition Study was conducted in November 2003 for the section of foreshore between Delwood Beach and Manly Point. The purpose of the investigation was to identify, among others, potential slope and cliff instability hazards and the likely consequences should a hazard occur.

A total of 17 sites with potential cliff and slope instability hazards were identified. Remediation works at two publicly owned sites have already been completed.

The main potential geotechnical hazards identified within the study area can be summarised as follows:

- a) localised erosion of undercuts and overhangs with subsequent rock falls from parts of the cliffline;
- b) toppling (*or forward rotation*) of blocks/overhangs from the top part of the cliffline.

The remediation of hazards identified on public land is the responsibility of Council who seeks external funding to implement remediation measures and to conduct further geotechnical assessments as recommended within the original CHDS.

Actions:

- Continue to implement remediation measures on public lands in stages. Seek external funding.
- Ensure that all coastal hazards are addressed using appropriate methods (such as pillars, rock bolts etc), rather than relying on large areas of concreting or removal of rock features and respect sites of Aboriginal significance.

Objectives addressed: CH4

Performance Target: Reduction of hazards from cliff & slope instability

Indicative Cost: \$250,000 (\$50,000 per year)

Time Frame: on-going

Responsible Agency: Manly Council- Urban Services & NR

Priority: Medium

CH.4.2 Reissue notifications to private property owners of identified coastal hazards potentially affecting their land and a reminder the information has been recorded on the properties S.149 Certificate

Context: A Hazard Definition Study was conducted in November 2003 for the section of foreshore between Delwood Beach and Manly Point. The purpose of the investigation was to identify, among others, potential slope and cliff instability hazards and the likely consequences should a hazard occur.

The slope and cliff instability hazards have also been identified on private properties. Council has formally notified a number of private property owners that their properties may be potentially affected by specific hazards identified through the CHDS process. This was done in the form of a letter to each owner notifying the nature of the hazard, the extent (if known), any recommendations from the CHDS and that a copy of the report is available upon request. Concurrently hazard information was also recorded on 149 Certificates for those properties affected.

Identified concerns should be reviewed for risk priorities and works completed. S149 certificates should not create unnecessary restrictions for property owners.

Actions: Reissue notifications to private property owners.

Objectives addressed: CH4

Performance Target: Reissuing of notification finalised

Indicative Cost: Staff cost

Time Frame: on-going

Responsible Agency: Manly Council- Regulatory Compliance

Priority: High

Objective**CH.5 Undertake measures to address risk from tsunami.****CH.5.1 Map tsunami risk areas**

Context: Tsunami/storm is one of the hazards identified in the Manly, Warringah and Pittwater Council's Local Disaster Plan (DISPLAN). Its threat level probability is rated as remote but consequence as major.

The NSW coast has experienced some 40 tsunami since European colonisation, larger tsunamis were recorded in 1868, 1877 and 1960. During 1960 tsunami, Manly was affected: a strip 100 yards by 60 yards from Clontarf Reserve Point Park was swept away.

Sydney Coastal Councils Group has recently carried out a study to test a GIS tool assessing the vulnerability of buildings to tsunami flooding. The study assessed Manly as a case area under a worse case scenario. Findings are:

- A total of 169ha of low-lying area would be inundated
- Water depth could reach a maximum of 7 m in the area next to lagoon
- 1133 buildings would be flooded

Map of the tsunami risk area, under the study scenario, has been prepared.

Actions: Refine tsunami map under the revised DISPLAN.

Objectives addressed: CH5

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Performance Target: tsunami map completed
Indicative Cost: \$40,000
Time Frame: on-going
Responsible Agency: Ministry of Police & Emergency Services
Priority: Low

CH.5.2 Identify, with SES, emergency measures including evacuation routes.

Context: Sydney Coastal Councils Group has recently carried out a study to test a GIS tool assessing the vulnerability of buildings to tsunami flooding. The study assessed Manly as a case area under a worse case scenario. The study recommended two possible evacuation routes:

Block 1: people living in the buildings on Roseberry Street and Balgowlah Road are very close to the boundary of the inundation zone, so they should just walk towards the hill.

Block 2: evacuation of buildings located in Block 2 is much more complex because buildings located inland close to the area of Balgowlah Road, would be affected by an inundation depth up to 5-6 metres, while those closer to the beach would be affected by only 1-2 metres. Therefore, people living inland and closer to the hills should evacuate to the more elevated areas. People living closer to the lagoon would probably be too far from the hill to reach it safely. Also, the bridge connecting Manly to Warringah would not be available, because it would be flooded. As a consequence, the only safe points of evacuation for people living close to the lagoon would be the highest and least vulnerable buildings close to the beach and in the area behind it.

Actions: Discuss these study recommendations with the SES and identify possible evacuation routes.

Objectives addressed: CH5

Performance Target: evacuation routes identified and agreed
Indicative Cost: \$5,000
Time Frame: Between 3-4 years
Responsible Agency: Ministry of Police & Emergency Services, SES, Manly Council -US
Priority: High

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4.7 OPTIONS ADDRESSING WASTE MANAGEMENT

Despite the presence of a range of rubbish bins within the Manly Cove study area, litter, both from harbour and land based activities, presents a continuing issue for the management and aesthetic quality of the Manly Cove study area. The high level of human activity on the harbour and surrounding urban areas contributes to an undesirably large amount of litter accumulating on harbour beaches.

Goal

Promote and facilitate sustainable waste management in Manly Cove

A total of six management options are proposed addressing two different objectives. Of these, three management options have been rated as of high priority, two having medium and the remaining one as having low priority. No option is proposed for immediate implementation. Four management options are already on-going activities of Council.

Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
WM.1 To reduce waste while maximising re-use and recycling in the Manly Cove study area	WM.1.1 Implement Council adopted strategies to reduce waste in Manly Cove	On-going	H(5), M(2), L(1)	High
	WM.1.2 Ensure adequate recycling facilities are provided in public areas and encourage responsible disposal of litter within the study area	On-going	H(5), M(2), L(1)	High
	WM.1.3 Continue to conduct and support community and business education programs to avoid litter production at source	On-going	H(4), M(3), L(1)	High
WM.2 To minimise risk to beach users and marine fauna from beach and marine waste while maintaining natural ecosystems	WM.2.1 Continue to operate the existing beach raking regime and try hand picking as an alternative from Manly Cove beaches	Within 2 years	H(1), M(7), L(0)	Medium
	WM.2.2 Conduct litter audit to determine sources of rubbish to inform treatment and education programs	Between 3-4 years	H(2), M(2), L(4)	Low
	WM.2.3 Encourage NSW Maritime to improve its water-based litter and debris cleaning regime	On-going	H(4), M(1), L(3)	Medium

*After adoption of the CZMP

DETAILS OF MANAGEMENT OPTIONS

Objective

WM 1 To reduce waste while maximising re-use and recycling in the Manly Cove study area.

WM.1.1 Implement Council adopted strategies to reduce waste in Manly Cove

Context: Manly Council is committed to achieving ecological sustainability at the local level. Manly being iconic tourist area, Council is always concerned with waste management. Manly Council conducted a Litter Summit in August 2001. Members of the residential and business community attended a workshop with representatives from government agencies and Council to discuss issues relating to litter avoidance and management. The outcomes of the summit resulted in Council adopting Litter Avoidance Strategy in 2003. Further, Council adopted the Zero Waste Strategy in 2005. The

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target is to achieve Zero Waste within 10 years. This will require a concerted effort by all sectors of the Manly community and visitors alike.

Actions:

- Improved enforcement of littering laws in beach and harbour reserves
- Monitor actions proposed in these strategies are implemented.
- Monitor impact of implementing these strategies in reducing total waste in Manly

Objectives addressed: WM1

Performance Target: Strategies are implemented

Indicative Cost: Staff time

Time Frame: on-going

Responsible Agency: Manly Council – Waste & Cleansing

Priority: High

WM.1.2 Ensure adequate recycling facilities are provided in public areas and encourage responsible disposal of litter within the study area

Context: The Manly Cove DCP (1996) provides controls for waste management within the study area to achieve a number of objectives including the following:

All pedestrian areas shall be adequately provided with clearly labelled compartmented waste receptacles to allow for self sorting of recyclable waste products i.e. glass bottles, PET bottles, cans and biodegradable materials such as food waste.

A comprehensive study of the Public Bins at Manly Cove and elsewhere has been conducted in order to improve maintenance of facilities and reduce recycling contamination rates etc. Manly Cove already has a high concentration of public bins.

Actions:

- Additional bins are provided in East Esplanade area to cater for high level of weekend use.
- Undertake educational program for responsible rubbish disposal
- Monitor that rubbish bins are frequently emptied

Objectives addressed: WM1

Performance Target: educational program intensified

Indicative Cost: Staff time

Time Frame: on-going

Responsible Agency: Manly Council – Waste & Cleansing

Priority: High

Sample Map: Bin Locations



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WM.1.3 Continue to conduct and support community and business education programs to avoid litter production at source

Context: Council's Corporate Plan 2010/13 identifies the key outcomes of waste avoidance as:

- Reduce material entering the waste stream, including increases in diversion rates.
- Educate residents, schools, businesses, industry and visitors to avoid, reduce, reuse and recycle to assist Council in its commitment to waste minimisation.
- Manage recyclable products on the basis of the reduce/reuse/recycle principle to maximise the diversion of material from the waste stream.
- Extend the range of recyclable materials suitable for collection within Council services to continually improve both the volume of materials collected and the level of contamination of materials collected.

Manly Council will continue to support community and business groups through targeted educational program.

Actions:

- Promote waste issues, including waste avoidance and reduction to local businesses by the dissemination of a range of resources and using champions and case studies
- Provide a Zero Waste advisory service for local businesses

Advantages: The initiative will reduce litter production at source.

Disadvantages: -

Objectives addressed: WM1

Performance Target: Educational programs continued

Indicative Cost: \$10,000 + Staff time

Time Frame: on-going

Responsible Agency: Manly Council – Waste & Cleansing, EPP

Priority: High

Objective

WM 2 To minimise risk to beach users and marine fauna from beach and marine waste while maintaining natural ecosystems.

WM.2.1 Continue to operate the existing beach raking regime and try hand picking as an alternative from Manly Cove beaches

Context: Beach raking is currently carried out daily on Manly Cove beach. This captures gross pollutants not captured by street sweeping or other pollutant reduction measures. This activity is known to be detrimental to the ecology of the intertidal area. Marine debris such as seagrass wrack (not rubbish) washed up on the shore provides an important source of food and habitat for a diverse range of invertebrate species that live in the sand, which are an important part of the intertidal food chain.



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Raking of the beach removes this habitat and food source.

Mosman Council (2005) tried hand cleaning on Chinamans beach to minimise the impact on beach invertebrates. This can be tried at Manly Cove.

Actions:

- Continue beach raking at Manly Cove beaches, preferably during low tides.
- Review relevant literature including Mosman Council's report
- Trial hand cleaning on Manly Cove beach for 5-6 weeks and analyse results
- Consider providing needle bins at toilets near Oceanworld

Advantages: *The gained knowledge will help in balancing between safe beach and eco-sensitive beach management. Beach raking is a routine practice in popular beaches.*

Disadvantages: *Alternative to beach raking is hand picking. Implementation of hand picking is laborious, expensive and time consuming and will fail to collect needles/glass under sand.*

Objectives addressed: WM2

Addressing actions under Manly Council's MSS 2006: C1.2.11 – Review of beach raking

Performance Target: Knowledge gained and applied

Indicative Cost: \$30,000

Time Frame: Within 2 years

Responsible Agency: Manly Council – Civic Services

Priority: Medium

WM.2.2 Conduct litter audit to determine sources of rubbish to inform treatment and education programs

Context: Council has identified these sources of litter in Manly:

- Littering food/drink containers, cigarette butts, paper, plastic bags and similar deposited from cars, carelessly/intentionally deposited, left behind unawares;
- Illegal dumping in reserves, bushland and roadsides;
- Organic litter accumulating in roadside gutters;
- Advertising material and newspapers not delivered correctly;
- Posters on poles;
- Unsecured loads;
- Building sites without adequate litter controls;
- Full bins allowing litter to blow away; and
- Uncollected dog faeces.

To avoid litter and thereby reduce the impact on the natural and built environment, Manly Council has adopted 'Litter Avoidance Strategy' in 2003. According to this Strategy, Council will examine the feasibility of conducting litter audits. Future audits will then be used to provide an indicator of the effectiveness of the litter avoidance and management strategies.

Actions:

- Conduct Litter Audit throughout Manly LGA
- Analyse findings to carry out treatments
- Undertake educational programs to complement 'Litter Avoidance Strategy'
- Address discarded fishing line and tackle
- Address rubbish accumulation under Manly Wharf through increased cleaning, to be done in consultation with Penguin Wardens.

Advantages: *The initiative will reduce litter production at source.*

Disadvantages: -**Objectives addressed:** WM2

Performance Target: Litter Audit completed
Indicative Cost: \$20,000
Time Frame: periodically, every 5 years
Responsible Agency: Manly Council – Civic Services
Priority: Low

WM.2.3 Encourage NSW Maritime to improve its water-based litter and debris cleaning regime

Context: NSW Maritime has a number of statutory responsibilities with respect to improving safety and protecting the environment on the State's navigable waterways, including the removal of rubbish from Sydney Harbour. The service provided by NSW Maritime through its Environmental Services team is currently the only effective means of removing floating litter and waste from Sydney Harbour including storm water pollution, other visible debris and floating hazards to navigation.

On average more than 3,500 cubic meters of rubbish is collected per year, ranging from large objects such as trees and tyres to the debris washed into the harbour from harbour side suburbs and small items left behind on beaches and other foreshore locations by members of the public.

Garbage can be fatal for marine animals and can also be a risk for recreational boaters and the fishing industry. Rope and plastic material may get caught in propeller shafts or block water intakes causing major damage, expensive repairs and loss of income while vessels are repaired.

Under the Protection of the Environment Operations Act 1997 (POEO Act), it is an offence to pollute any waters in NSW unless permitted under an environment protection licence issued by the Environment Protection Authority. Garbage from vessels should be stored on board and disposed of responsibly once you are back on shore.

Actions:

- Liaise with NSW Maritime
- Organise increased collection effort in Manly Cove
- Assist NSW Maritime to undertake educational programs

Advantages: The initiative will reduce water based litter and garbage.

Disadvantages: -**Objectives addressed:** WM2

Performance Target: Increased collection efforts
Indicative Cost: Staff time
Time Frame: on-going
Responsible Agency: Manly Council – Civic Services, NSW Maritime
Priority: Medium

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4.8 OPTIONS ADDRESSING ACCESS & TRAFFIC MANAGEMENT

With Manly Cove, and more specifically Manly Wharf, acting as a major tourist and commuter link, this section of the study area provides safe, well maintained and lit access for a variety of users. However, there are a number of areas which have been identified as requiring improvement in order to meet the standard set by the Access DCP and to meet community needs.

Goal
To provide an environment at Manly Cove that is accessible to all people

A total of four management options are proposed addressing one objective. Of these, three management options have been rated as of medium priority and the remaining one as low priority. One management option is already an on-going activity of Council.

Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
AM.1 To improve and control access for pedestrians, cyclists, water based recreation and servicing vehicles, minimising conflicts and negative impacts	AM.1.1 Encourage NSW Maritime lessees to improve beach access and public amenity immediately east of the Manly Wharf development	On-going	H(2), M(3), L(1)	Medium
	AM.1.2 Audit disability access of all parks and access ways within the study area	Within 2 years	H(3), M(2), L(3)	Medium
	AM. 1.3 Rebuild the ramp located beside the Manly Art Gallery as wheelchair accessible	Between 3-4 years	H(3), M(1), L(3)	Medium
	AM.1.4 Investigate the feasibility of constructing an underground pedestrian pathway to link Manly Wharf with the Corso	Between 3-4 years	H(1), M(0), L(3)	Low

*After adoption of the CZMP

DETAILS OF MANAGEMENT OPTIONS

Objective

AM 1 To improve and control access for pedestrians, cyclists, water based recreation and servicing vehicles, minimising conflicts and negative impacts.

AM.1.1 Encourage NSW Maritime lessees to improve beach access and public amenity immediately east of the Manly Wharf development

Context: The newly renovated Manly Wharf (currently leased to private operators by NSW Maritime) encompasses a range of uses providing waterfront bars and restaurants, shopping and entertainment and water based recreation. These attractions are popular with tourists and local day-trippers as well as Manly locals. However, this popularity has resulted in a range of management issues, including:

- Fishing from Manly Wharf is currently prohibited, however the practice is often observed, particularly during early morning and evening when the location is not monitored by Wharf security.
- Noise pollution stemming from Manly Wharf is periodically an issue, particularly for neighbouring residents. Noise also significantly impact on wildlife such as Little Penguins who are known to nest underneath the Wharf structure.

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- *Anti-social behaviour, mostly as a result of alcohol consumption, is an ongoing problem in the areas surrounding Manly Wharf.*
- *Skateboarding in the forecourt area of Manly Wharf has been identified as posing safety concerns for users of the area; mostly from elderly residents and parents with prams who identify the risk of injury should a collision occur.*
- *Threats posed by people, noise and bright lights, particularly during the early morning and evening when Little Penguins are known to become mobile during feeding activity*
- *Access to beach and water from the Manly Wharf is severely restricted. There is a need for the provision of improved beach access at the site identified as the curved set of stairs to the eastern side of Manly Wharf.*
- *Council has received ongoing complaints in relation to excessive litter, food waste, foul odours and feral bird problems as a result of through inadequate bin/table maintenance and the level of waste created by a number of retailer outlets. The responsibility of waste management at Manly Wharf lies with the lessee (via conditions set by NSW Maritime as owner) as they manage retail and commercial operations in this vicinity.*

The Access Committee has indicated that wheel chair is not accessible to ramp used by private fast ferry.

Action:

- *Encourage NSW Maritime, Wharf Management and Council to continue to discuss and improve on public facilities and access.*
- *Ensure clear paths of access through to Manly Wharf for wharf users*

Objectives addressed: AM1

Performance Target: *Improved beach access*

Indicative Cost: *Staff time*

Time Frame: *on-going*

Responsible Agency: *Manly Council – Urban Services, NSW Maritime, Wharf Management*

Priority: *Medium*

AM.1.2 Audit disability access of all parks and access ways within the study area

Context: *An audit is required to plan improving facilities for persons with disabilities and seniors through the provision of enhanced infrastructure and facilities. This will allow them easy access to reserves and where possible to water fronts. The need for an audit is in line with the federal Disability Discrimination Act and also Manly Council's Social Plan 2004. People with a disability and services identified problems with wheelchair access to theatres, libraries, parks, shops, doctors' surgeries and banks. This issue was also related to the problem of uneven footpath surfaces. People with a disability and service providers identified the supply of accessible transport services including taxis for the disabled, transport for medical appointments in an emergency, and wheelchair friendly public transport and public toilets as a high priority need for Manly residents. Accompanying this issue were the problems associated with infrastructure such as a lack of waterproof bus shelters and the short time phasing of lights at intersections.*

Actions:

- *Audit all public access ways to ensure that these are wheelchair accessible..*
- *Identify paths requiring disability access*
- *Implement disability access at priority locations.*

Objectives addressed: AM1

Performance Target: *Audit completed*

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Indicative Cost: \$ 20,000
Time Frame: Within 2 years
Responsible Agency: Manly Council – SLUP
Priority: Medium

AM.1.3 Rebuild the ramp located beside the Manly Art Gallery as wheelchair accessible

Context: The ramp beside the Manly Art Gallery is too steep and is not suitable for wheelchair access. The ramp is on the popular access way connecting Manly CBD to other areas. The Access Committee is the proponent of this option. There is also need for proper separation of bicycle and pedestrians in the area.

Actions:

- Assess and redesign the ramp.
- Seek funding from external and internal sources
- Rebuild the ramp.

Objectives addressed: AM1

Performance Target: Redesigned ramp completed
Indicative Cost: \$100,000
Time Frame: To be implemented within 3-4 years
Responsible Agency: Manly Council – Urban Services
Priority: Medium

AM.1.4 Investigate the feasibility of constructing an underground pedestrian pathway to link Manly Wharf with the Corso

Context: A high standard of access is provided in the areas adjacent to Manly Wharf including the bus interchange and toward Manly Corso. During community consultations, people rated the movement of pedestrians between Manly Corso and the Wharf interchange as poorly organised. The concept of an underground pathway to transfer pedestrians underneath East/West Esplanade was supported by a number of respondents during consultation.

There is demand for such an underground path considering increasing day trippers are flocking Manly during summer season.

Action: Initiate discussion with the RTA, state government, NSW Maritime (as owner of Manly Wharf) on underground pathway. If positive, initiate a feasibility study.

Advantages: This will facilitate safe and speedy movement of pedestrian.

Disadvantages: This could be fraught with problems such as safety, vandalism, aesthetic, cost and maintenance.

Objectives addressed: AM1

Performance Target: Feasibility study completed
Indicative Cost: 100,000 (feasibility study)
Time Frame: Between 3-4 years
Responsible Agency: Manly Council – US (Traffic), RTA, Manly Wharf
Priority: Low

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4.9 OPTIONS ADDRESSING GEODIVERSITY

Manly's geodiversity is an important element of our natural environment. This concept covers the whole range of natural earth materials and processes. It includes the rocks, landforms, streams, beaches, soils, sediments and groundwater features. It is important that this geodiversity is recognised and preserved.

Goal

Conserve the significant geodiversity elements of the area's coastline.

A total of two management options are proposed addressing one objective. Of these, one management option has been rated as of medium priority and the other as low priority. One option is proposed for immediate implementation. Both management options are newly proposed activities.

Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
GD.1 To protect and conserve the important elements of Manly's geodiversity through raising awareness, considering its values in all planning and management and integrating with biodiversity and cultural heritage management	GD.1.1 Undertake a comprehensive assessment of geoheritage values of Manly LGA	Immediate	H(0), M(1), L(6)	Low
	GD.1.2 Ensure that geoheritage issues are considered during development assessment processes	Between 3-4 years	H(1), M(3), L(3)	Medium

*After adoption of the CZMP

DETAILS OF MANAGEMENT OPTIONS

Objective

GD 1 To protect and conserve the important elements of Manly's geodiversity through raising awareness, considering its values in all planning and management and integrating with biodiversity and cultural heritage management.

GD1.1. Undertake a comprehensive assessment of geoheritage values of Manly LGA.

Context: While the principal rock outcropping in Manly is Hawkesbury Sandstone, it is by no means uniform, and a range of sedimentary structures in the rock can be seen in the cliffs along Marine Parade and at other localities. Some structures such as joints, faults and shear zones cut through the sandstone and guide landform development. While much of Manly has been modified, significant examples of large and small-scale landforms remain, all of which need to be identified and appropriately managed. Osborne (2008) has described geology of Manly and changes through geological time.

Actions:

- The option involves contracting a study on assessment of geodiversity and identification and description of geoheritage sites.
- Recognise and manage appropriately, the heritage value of the foreshore as a substantial part of the Manly LGA boundary.

Objectives addressed: GD1

Addressing SMCMA catchment targets: CTLD3 – Indigenous cultural landscape values are identified, and incorporated into natural resource management activities

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Performance Target: Study completed
Indicative Cost: \$20,000
Time Frame: Immediate
Responsible Agency: Manly Council – Strategic Landuse Planning & Natural Resources
Priority: Low

GD1.2. Ensure that geoheritage issues are considered during development assessment processes.

Context: Manly area shows a rich geodiversity, including sandstone cliffs, sandy beaches, rocky intertidal and remnants of the original stream (now piped). But these are being heavily modified through urban development. Much of this natural landscape provides important habitat for key flora and fauna, and thus supporting maintenance of biodiversity. It also contains significant aboriginal heritage value. As such it is essential to ensure that future development appropriately considers geoheritage values.

Action: Based on identification of geoheritage sites through the Assessment, conducted under GD1.1, an appropriate level of development should be implemented on those sites. Development assessments should consider geoheritage, once identified.

Objectives addressed: GD1

Addressing SMCMA catchment targets: CTLD3 – Indigenous cultural landscape values are identified, and incorporated into natural resource management activities

Performance Target: DA assessments to consider geoheritage
Indicative Cost: Staff time
Time Frame: Between 3-4 years
Responsible Agency: Manly Council – Strategic Landuse Planning, DA Unit
Priority: Medium

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4.10 OPTIONS ADDRESSING HERITAGE CONSERVATION & MANAGEMENT

Manly Cove is rich in its cultural heritage, including indigenous heritage, natural heritage, and the built heritage representing the historic development of the Manly Local Government Area. The community and Council seek to preserve items of heritage significance and encourage sensitive management and conservation of heritage items both within public and private ownership.

The natural environment of the Manly Cove study area would have been well suited to occupation by Aboriginal people. The area was rich in resources and the variety of plant and animal species, both terrestrial and aquatic would have been highly utilised by Aboriginal people.

The entire Manly Cove study area was used extensively by the Aboriginals, known locally as the Gayemal clan of the Guringai tribe, who spent much of their time on the foreshores of Sydney Harbour (Aboriginal Heritage Office, 2008). The oldest Aboriginal site known in the Manly LGA is dated to about 4100 years before present although it is expected that older sites will be discovered. There are at least five known Aboriginal sites in the study area, consisting of burial sites, open middens, shelters and rock engravings. The area is considered to have high potential for further unrecorded sites. Based on landscapes or physical setting, the likely range of cultural evidence associated with the landscape and the landscape history, AHO & MC (2006) has identified the foreshore areas, including Esplanade Park as having high potential to find further Aboriginal sites.

However, the entire study area has been populated by Europeans soon after European settlement in 1788. Manly Cove study area houses a number of architectural, archaeological and landscape items, such as, Manly Cove Pavilion, Manly Wharf, Manly Rowing & Sailing Club, Remains of Manly Public Baths, Site of Manly Fun Pier, stone wall, stone kerbing, the foreshore, West and East Esplanade Reserves (**Appendix C**).

A total of two management options are proposed addressing two different objectives. Of these, one management option has been rated as of high priority and the other as medium priority. Both of these management options are on-going activities of the Council.

Objectives	Strategic Management Options	Implementation timeframe*	Priority	
			Individual	Overall
HC 1 Ensure that sites of Aboriginal heritage are protected and appropriately maintained.	HC1.1. Review Aboriginal Site Management Report for Manly Council (2006) and associated reports to prioritise management needs and develop a plan of implementation.	On-going	H(0), M(3),L(3)	Medium
HC2 Ensure that all sites of non-indigenous heritage are protected under relevant legislations and in Council planning instruments.	HC2.1. Ensure physical protection and maintenance of all heritage listed items.	On-going	H(5), M(1),L(2)	High

*After adoption of the CZMP

DETAILS OF MANAGEMENT OPTIONS

Objective

HC 1 Ensure that sites of Aboriginal heritage are protected and appropriately maintained.

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HC1.1. Review Aboriginal Site Management Report for Manly Council (2006) and associated reports to prioritise management needs and develop a plan of implementation.

Context: The Aboriginal Heritage office (AHO) has prepared the Aboriginal Site Management Report (2006) for Manly Council. This report has been reviewed. While many sites are in good to reasonable condition, others show signs of degrees of degradation because of exposure to a variety of uses including lack of understanding in the community. Two of the sites are located on the Manly Scenic Walkway. This report has been used to prioritise management needs.

Action:

- The option involves continuation of Aboriginal site management through formulation of Works program.
- Consult and maintain liaison and seek approval with the Metropolitan Aboriginal Lands Council and Aboriginal Heritage Office.
- Develop and install additional interpretive signage identifying and recognising the Aboriginal traditional owners of the Manly Cove area

Objectives addressed: HC1

Addressing actions under Manly Council's MSS 2006: D2.2.5 – implement the Management Plan for Aboriginal heritage

Addressing SMCMA catchment targets: CTLD3 – Indigenous cultural landscape values are identified, and incorporated into natural resource management activities

Performance Target: Prioritisation done

Indicative Cost: Staff time

Time Frame: On-going

Responsible Agency: AHO, Manly Council – Strategic Landuse Planning

Priority: Medium

Objective

HC2 Ensure that all sites of non-indigenous heritage are protected under relevant legislations and in Council planning instruments.

HC2.1. Ensure physical protection and maintenance of all heritage listed items.

Context: It is likely that many sites of historical significance (primarily European heritage) have become degraded with time. Some of these sites are still used on a regular basis (e.g. swimming enclosures and seawalls) and in some cases, may represent a public risk.

Action: This option involves Council carrying out repairs to these structures to ensure their integrity, or possibly restoring currently degraded structures / sites as show-pieces of former usage and activities.

Council would primarily be responsible for the repairs and restoration of historical items / structures under its control.

Improve interpretive signage and its positioning in relation to the Pathway of Olympians.

Objectives addressed: HC2

Addressing actions under Manly Council's MSS 2006: D2.1.7 – retention of heritage fabric

Performance Target: Maintained & protected

Indicative Cost: \$60,000

Time Frame: On-going

Responsible Agency: Manly Council – Strategic Landuse Planning, Urban Services

Priority: High

5. IMPLEMENTATION PLAN

Council's Integrated Plans (incorporating the Community Strategic Plan Beyond 2021, Resourcing Strategy and Four Year Delivery Program and One Year Operational Plan) are the key planning documents that will drive the operations of Council. The Manly Council's Integrated Plans will be the key planning documents driving the operations of Council during the next ten years and beyond. Efforts will be made to incorporate priority options in to the next Manly Delivery Program 2011 – 2015 and subsequent Plans.

Each year, the Council allocates the organisation's annual expenditure to the five Principal Activities: governance, people & place, people services, infrastructure services and the environment, taking into account priorities identified in the various supporting Plans and Strategies and taking into account emerging issues, community feedback, advice from Manly Council's operational management, and progress towards the Manly Vision. Many program activities are on-going and are considered "core services" of Local Government. These operate on a continual improvement model and attract funding each year. Others are one-off initiatives which must compete competitively for funds based on merit. An exhaustive list of capital works programs are itemised as part of the budget section of the document.

The current plan is Four Year Delivery Program 2011-2015 and One Year Operational Plan 2011-2012.

5.1 FUNDING REQUIREMENTS

The total cost of implementing (including 1-5 years of operation and maintenance) the 66 management options addressing ten key management issues have been indicatively estimated as **\$ 1,616,000**. Council expenditure is often supplemented by a variety of external grant sources derived from State and Federal Government, as well as industry. A summary of estimated indicative cost is presented in **Table 5.1**. However, cost of each management option is indicated with details for that individual option (Sections 4.1 -4.6).

Table 5.1 Summary of estimated cost

Management Issues	Number of Management Options	Estimated Indicative Cost (\$)			
		High priority	Medium Priority	Low priority	Total
Aquatic Habitat	9	0	50,000	0	50,000
Boating Facilities	8	60,000	65,000	0	125,000
Public Facilities	7	115,000	56,000	0	171,000
Water Quality	8	185,000	50,000	0	235,000
Terrestrial Ecology	6	50,000	65,000	0	115,000
Hazards & Climate Change	14	65,000	455,000	40,000	560,000
Waste Management	6	10,000	30,000	20,000	60,000
Access	4	0	120,000	100,000	220,000
Geodiversity	2	0	0	20,000	20,000
Heritage Conservation	2	60,000	0	0	60,000
	66	545,000	891,000	180,000	1,616,000

Almost one-third of the total cost will be required to implement management options addressing hazards and climate change (**Fig 5.1**).

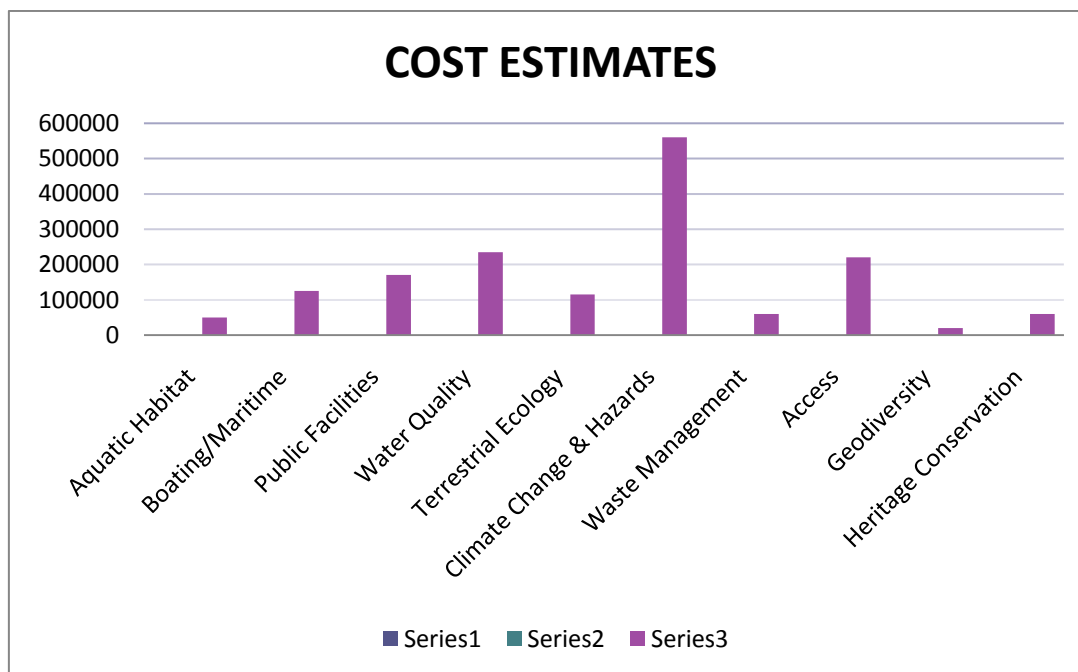
Funding schedule for the total estimated cost is:

Year	1	2	3	4	5	Total
\$	459,000	375,000	239,000	354,000	189,000	1,616,000

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Some actions require an on-going commitment from existing staff rather than the outlay of expenditure and this is noted as 'Time'. Some recommended actions require significant capital costs, especially where large-scale works are involved such as beach nourishment.

Fig 5.1 Cost allocations to address key issues



As indicated elsewhere, implementation responsibility of all proposed management options rests with a number of agencies including Manly Council. Hence, adoption of this CZMP does not commit Council to allocate immediate funding.

5.2 FUNDING SOURCES

Funding from different alternative sources will be pursued (**Appendix B**). These include but are not limited to:

- Council's Environment Levy (subject to a budget bid process);
- Council's General Revenue Budget (subject to a budget bid process);
- State Government's Coastal & Estuary Management Program (50% subsidy funding subject to a submission process);
- Other Commonwealth and State Government funded programs such as SSHAP, MIP, NRDGS, Greenspace, CMA Funding etc

5.3 COLLABORATIVE PARTNERSHIPS

A number of state and other agencies have institutional mandate to address a range of issues covered under different management options within this report. Agencies involved in the implementation of management options are identified in **Appendix A**. Manly Council, as the primary implementer of the CZMP, must seek to sustain collaborative partnership agreements with these agencies either specifically for this CZMP or for overall LGA.

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5.4 AGENCY RESPONSIBILITIES

Although Manly Council is the lead agency responsible for implementing the CZMP, there will be several state Government and other agencies responsible for implementing specific management options, as per mandate of their activities. Agencies will have the main role for some and supportive role for others, as indicated in **Table 5.4a**.

Table 5.4a: Roles of different agencies in implementation of proposed management options

Agency	Management Options with Implementation Responsibilities	
	Main	Supportive
Manly Council*	AH1.1 [#] , AH1.2, AH2.1, AH2.4, AH3.2, BF1.1, BF1.2, BF2.1, BF2.4, BF3.3, PF1.1, PF1.2, PF1.3, PF1.4, PF2.1, PF2.2, PF3.1, WQ1.1, WQ1.2, WQ1.3, WQ2.2, WQ3.1, WQ3.2, WQ3.3, TE1.1, TE1.2, TE1.3, TE1.4, TE2.1, CH1.1, CH1.2, CH1.3, CH1.5, CH2.1, CH2.2, CH3.1, CH3.2, CH3.3, CH4.1, CH4.2, WM1.1, WM1.2, WM1.3, WM2.1, WM2.2, WM2.3, AM1.1, AM1.2, AM1.3, AM1.4, GD1.1, GD1.2, HC1.2	AH2.2, AH2.3, AH3.1, BF3.1, BF3.2, WQ2.1, CH1.4, CH5.2, HC1.1
NSW Maritime*	BF2.2, BF3.1, BF3.2,	AH2.2, BF2.1, BF2.3, BF3.3, WM2.3, AM1.1
DPI NSW*	AH2.2, AH2.3, AH3.1,	AH1.2, AH2.1, AH2.2, AH2.4, BF3.2, PF1.3
OEH (formerly DECCW)*		WQ3.1, CH1.4
Ministry of Police & Emergency Services	CH5.1, CH5.2	
SES		CH5.2, CH1.5
Sydney Water	WQ2.1	
Sydney Ferries	BF2.3	
SCCG	CH1.4,	CH3.2
AHO	HC1.1	
Manly Wharf		AM1.1, AM1.4
RTA		AM1.4

* Members of the Harbour Foreshores & Coastline Management Committee and participated in the development of the CZMP

[#] AH = Aquatic Habitat, BF = Boating Facilities, PF= Public Facilities, WQ = Water Quality, TE = Terrestrial Ecosystem, CH = Climate Change & Hazards, WM = Waste Management, AT = Access & Traffic, GD = Geodiversity and HC = Heritage Conservation

Within Manly Council, different Divisions/Branches of Council will share responsibilities for implementing specific management options. These responsibilities have also been identified (**Table 5.4b**).

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Table 5.4b: Roles of different Divisions/Branches within Manly Council in implementation of proposed management options

Division	Branch	Management Options with Implementation Responsibilities	
		Main	Supportive
Landuse & Sustainability	Natural Resources & Environmental Partnerships & Programs	AH1.2#, AH2.1, AH2.2, AH2.3, AH2.4, WQ1.1, WQ1.2, WQ1.3, WQ2.1, WQ2.2, WQ3.1, BF1.1, BF2.1, BF3.1, BF3.2, BF3.3, WQ3.3, TE1.4, TE2.1, CH1.1, CH1.3, CH1.4, CH2.2, CH2.1,	AH1.1, AH1.2, AH3.1, AH3.2, PF1.3, PF2.2, WQ3.2, CH1.2, CH1.5, CH2.1, CH3.1, CH3.2, CH3.3, CH4.1, GD1.1, TE1.2 WM1.3
	Manly Environment Centre (MEC)	AH1.1, AH3.2,	CH2.1,
	Strategic Landuse Unit	PF1.1, PF2.1, CH1.2, AM1.2, GD1.1, GD1.2, HC1.1, HC1.2	CH2.2, CH1.4
	Waste & Cleansing	WM1.1, WM1.2, WM1.3,	
	Regulatory Compliance	AH3.1, BF1.2, WQ3.2, CH4.2	BF2.1, WQ3.3,
	Development Assessment	PF3.1	WQ3.3, CH1.2, GD1.2
People, Places & Infrastructures	Urban Services	PF1.2, PF1.3, PF1.4, PF2.2, CH1.5, CH3.1, CH3.2, CH3.3, CH4.1, CH5.2, AM1.1, AM1.3, AM1.4	PF1.1, CH1.3, HC1.2
	Civic Services	WM2.1, WM2.2, WM2.3	
	Parks & Bushlands	TE1.1, TE1.2, TE1.3	TE2.1,
Strategic Unit	Community Engagement & Consultation	BF2.4,	

AH = Aquatic Habitat, BF = Boating Facilities, PF= Public Facilities, WQ = Water Quality, TE = Terrestrial Ecosystem, CH = Climate Change & Hazards, WM = Waste Management, AT = Access & Traffic, GD = Geodiversity and HC = Heritage Conservation

5.5 COORDINATION

Implementation of Manly Council's adopted Coastal Zone and Estuary Management Plans is coordinated by Council's Estuary Management Officer within Council's Natural Resources Branch. The Manly Harbour Foreshores & Coastline Management Committee assist with setting the strategic direction associated with development and implementation of such Plans.

5.6 COMMUNITY INVOLVEMENT

Many of the management options adopted for Manly Cove CZMP offer opportunities for community involvement particularly activities such as revegetation projects, monitoring programs and environmental education, as well as general monitoring of plan implementation and effectiveness. Local community groups are therefore

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encouraged to take active part in the management of Manly cove, to liaise regularly with the community representatives on the Harbour Foreshores & Coastline Management Committee, and seek out opportunities wherever possible for community participation in implementation of the options adopted.

5.7 REVIEW OF PLAN

This Coastal Zone Management Plan will be reviewed every 5 years. It is likely that a consolidation of a number of CZMPs will happen and preparing CZMPs based on new NSW Government guideline. During the process, there will be a mechanism established to identify new issues and conflicts concerning the coastline management and ensure their incorporation into a revised plan. A program for the following 5 years will be developed by designating priority to any new actions and reassigning priority to the remaining actions. These programs are fed back into and form the revised CZMP for the next 5 years.

The revised CZMP will recognise any new innovations, knowledge in general or on climate change and variability in particular, decision support tools for management of the Manly Cove that may not have been available at the time of the initial plan development.

6. MONITORING, EVALUATION & REPORTING

Monitoring & evaluation is a key component of any coastline/estuary management plan. The NSW Government has endorsed a strategy for a 'monitoring, evaluation and reporting (MER)' system for natural resource management in NSW in 2006. The purpose of the MER Strategy is to refocus the resources of NSW natural resource and environment agencies and coordinate their efforts with CMAs, local governments, landholders and other natural resource managers to establish a system of monitoring, evaluation and reporting on natural resource condition.

The Natural Resources Commission (NRC) recognises that implementing MER for NRM is challenging and traditionally has not been done well.

When used for management purposes, monitoring provides an on-going picture of the health and response of the estuary & coast, e.g. water quality levels, species and numbers of fauna, area and productivity of seagrass beds etc. A monitoring program can be involved and quite expensive. Hence, it is important that the monitoring program is realistic, useful, implementable and affordable on a continual basis.

Understanding coast and estuary health will also contribute to effective adaptation to climate change impacts.

6.1 MONITORING

To manage its coastal beach and foreshore locations in a holistic and sustainable manner, Council has adopted a strategic approach to coastal zone management which aims to enhance the human experience whilst minimising environmental impact. Prior to the development of the Manly Cove CZMP, Manly Council has already prepared & adopted seven of eight estuary/coastal zone management plans to cover entire coast & foreshores. This plan is expected to be adopted by end 2011.

It is timely that a structured long-term monitoring program is established to continually assess environmental health of the estuary & coast.

6.1.1 Status of Monitoring within Manly Council

At present, Council has no structured & written monitoring plan to assess environmental health of coast & estuary. However, the SHOROC's Regional State of the Environment Report, prepared annually in collaboration with SHOROC member Councils, provided numerical data on a comprehensive range of indicators. Now, each Council will prepare its own SoE Report annually and Regional SoE will only be prepared once in four years.

A State of the Environment (SoE) Report is an important management tool for councils to determine the effect of management actions on environmental conditions in the local area. It provides a snapshot, among others, of the State (or condition) of the environment. i.e. the environmental quality and quantity of natural resources. The SoE also provides a document to report Manly's progress towards meeting the goals and objectives of the Manly Sustainability Strategy, and therefore towards our overall goals of sustainability. Comparing SoE reports from year to year enables Council to gauge improvements in different sectors of the environment, and also identify those areas that will need attention in the future. Indicators used in the SoE report along with data related to Manly LGA are presented in **Appendix D**.

Long-term water quality monitoring data is, however, available at present from the 'Harbour Watch Program' and 'Beach Watch Program' of the Department of Environment, Climate Change and Water (DECCW). Key concern of these programs is human health relating to the use of waters. Hence, DECCW used to monitor two major indicators of bacterial contamination, *faecal coliforms* and *enterococci*, at various harbour swimming locations. From now on, only data on *enterococci* will be measured. There are 11 sampling sites: 4 under Beach Watch and 7 under Harbour Watch Programs within Manly LGA area (**Table 6.1.1**).

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Table 6.1.1 Water Quality Sampling Sites within Manly LGA

Harbour Watch Program (DECCW) (Bath/pool/swimming enclosures)		Beach Watch Program (DECCW)		Recreational WQ Monitoring Program (Manly Council 2008)	
1	Little Manly	1	Queenscliff beach	S1	Queenscliff
2	Manly Cove	2	North Steyne beach	S2	North Steyne
3	Fairlight	3	South Steyne beach	S3	South Steyne
4	Forty Baskets	4	Shelly beach	S4	Shelly beach
5	Clontarf			S5	Little Manly
6	Sangrado			S6	Manly Cove
7	Garney Crescent			S7	Fairlight P
				S8	Fairlight beach
				S9	Forty Baskets
				S10	Clontarf

6.1.2 Water Quality Monitoring within Manly Council

Manly Council conducts water quality monitoring to guide decision making in the protection of the environment, recreational water quality, and in environmental restoration projects. Monitoring projects are conducted in partnership with research organisations, Warringah Council, Sydney Water, and the NSW Government. This information report provides a description of the program. Seven Key water quality monitoring sub-programs include (Water Cycle Management Team, personal communication):

1. Wet Weather Stormwater Event Monitoring

Description: Council undertakes a range of wet weather stormwater monitoring from drains, creeks, pipes, and pollution control devices (gross pollutant traps, street sweeping vehicles, vegetated stormwater treatment systems). This is undertaken with the University of NSW, UTS, UWS, Sydney Water, and the NSW EPA.

Constituents monitored: bacteria, sediment, nutrients, and heavy metals.

Purpose: to allocate Council resources, enforce cleaner stormwater quality, and inform Council on the current success of pollution control measures.

2. Dry Weather Sewer Leak Monitoring

Description: Council undertakes a program to detect and rectify illegal sewer leaks to stormwater infrastructure associated with aging infrastructure or illegal connections, in normal (dry weather) conditions. This is a partnership with Sydney Water, and has also been adopted by Warringah Council at Manly Lagoon.

Constituents monitored: bacteria, and sewage indicator parameters (ammonia).

Purpose: to improve recreational water quality in Manly and reduce sewage impacts on Manly Lagoon.

3. Recreational Water Quality Monitoring

Description: Commencing in 2008, between October - March annually, Council undertakes a pilot program to monitor water quality in 10 identified recreational waterways to complement the existing NSW Government Beachwatch system.

Constituents monitored: physio-chemical and environmental monitoring trigger values

Purpose: to improve procedures and preparation in the event of a pollution incident or beach closure.

4. Manly Lagoon Water Quality Monitoring (approximately monthly)

Description: Council has undertaken past programs to monitor the quality of water in Manly Lagoon to advise management activities. However, in recognition of the surrounding urban catchment being the source of Manly Lagoon's water, monitoring resources are now focussed on sub-programs 1, 2, and 7 of this report.

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Constituents monitored: Council continues to utilise publically available water quality monitoring data collected approximately monthly in Manly Lagoon by Sydney Water. Parameters include bacteria, and physio-chemical parameters.

Purpose: undertaken by Sydney Water to assess the sewer system impact on the environment.

5. *Manly Lagoon Rehabilitation Works Improvement Monitoring*

Description: Council has received conditional NSW Government approval and significant NSW grants to proceed with works to remove accumulated material from the western section of Manly Lagoon. Council has undertaken a program to assess the “before”, “during”, and “after” water quality of the Lagoon, using a qualified environmental consultant.

Constituents monitored: sediment, nutrients, organic compounds, trace metals, bacteria, biological indicators, and physio-chemical parameters.

Purpose: “before” and “after” monitoring will be used to determine the beneficial impact of the project. The “during” monitoring will be used to ensure staging of the works do not negatively impact the environment.

6. *Alternate Water System Monitoring*

Description: Council undertakes water quality monitoring of existing alternate water sourcing systems including stormwater harvesting tanks, rainwater tanks, and groundwater bores. These are used for irrigation of parks, flushing toilets, and non-potable purposes.

Constituents monitored: groundwater – physio-chemical, salinity, nutrients, heavy metals. Rainwater and stormwater – physio-chemical, nutrients, bacteria.

Purpose: the data provides baseline assurance that systems are functioning appropriately and within specifications (for example, that groundwater is within plant tolerance limits). New potential sites are also investigated for new projects.

7. *Burnt Bridge Creek Integrated Restoration Project Improvement Monitoring*

Description: Council has received \$1.997 million from the NSW Government to implement an integrated restoration project in Burnt Bridge Creek. Council has undertaken a program to assess the “before”, and “after” water quality of the creek.

Constituents monitored: physio-chemical, nutrients, heavy metals, bacteria

Purpose: “before” and “after” monitoring will be used to determine the beneficial impact of the project.

Monitoring estuary & coastal health, no doubt, goes beyond indicators being monitored for the SoE report & other water quality assessments.

6.1.3 Model Monitoring System

The Natural Resources Commission has made a rapid assessment of several models of monitoring being implemented in Australia (NRC 2007) and cited the ‘Ecosystem Health Monitoring Program (EHMP)’ undertaken in south-east Queensland’ as an example.

The Ecosystem Health Monitoring Program (EHMP) is one of the most comprehensive marine, estuarine and freshwater monitoring programs in Australia (EHMP 2009). It delivers a regional assessment of the ambient ecosystem health (or ‘pulse’) for each of South East Queensland’s (SEQ) 19 major catchments, 18 river estuaries, and Moreton Bay, highlighting where the health of waterways is getting better or worse. The EHMP is managed by the South East Queensland Healthy Waterways Partnership on behalf of its various partners and is implemented by a large team of experts from the Queensland Government, universities and CSIRO.

The EHMP uses rigorous science to measure waterway health using a broad range of biological, physical and chemical indicators of ecosystem health. These indicators were chosen because they provide essential information about the condition of waterways. Currently, 135 freshwater sites are monitored twice a year (in spring and autumn), and 254 estuarine and marine sites are monitored on a monthly basis. The results provide an assessment of the responses of aquatic ecosystems to human activities, such as catchment alterations and

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point source discharges (e.g. wastewater treatment plants (WWTPs), and also take into account natural processes such as rainfall. The estuarine/marine component, one of three components of EHMP assesses the tidal reaches of waterways including Moreton Bay.

The Estuarine/Marine EHMP monitors a range of physical/chemical and biological indicators: water quality, seagrass depth range and distribution, $\delta^{15}\text{N}$ mapping, *Lyngbya* and coral.

- *Water quality* is measured monthly at 167 sites and is comprised of physic-chemical parameters, dissolved and total nutrients, water clarity and phytoplankton abundance. Water quality information is collected to assess baseline ecosystem process and to track changes in the zones of human impact.
- Sewage nitrogen mapping, measured annually at 167 sites, assesses the extent of sewage treatment plant discharges into SEQ waterways through measurements of the uptake of the stable nitrogen isotope ^{15}N by the macroalga *Catenella nipae*.
- The seagrass depth range (SDR) is the difference in elevation (m) between the upper and lower depth record of the seagrass *Zostera capricorni* at a site. The distribution of seagrass in Moreton Bay is mapped every three years using a combination of remotely sensed images, underwater camera observation and visual estimation of seagrass cover.
- Riparian vegetation provides the interface between the land and a water body. The EHMP measures the extent of riparian habitat in the estuaries as the percentage of the total system that has retained unmodified riparian habitat. Measured 3 yearly.

Indicators & parameters used in EHMP is presented in **Table 6.1.2**.

Table 6.1.2: Ecosystem Health Monitoring Program (Estuarine & Marine)

Indicators		Frequency
Water Quality	Turbidity	monthly
	Salinity	TBD
	Water temperature	TBD
	Secchi depth	TBD
	Dissolved Oxygen	TBD
	pH	monthly
	Nitrogen	monthly
	Phosphorus	monthly
	Chlorophyll a	monthly
Sewage Plume Map (Algae $\delta^{15}\text{N}$ Mapping)	$\delta^{15}\text{N}$ value	annually
Seagrass Depth Range & Distribution	Seagrass Depth Range (SDR)	3-yearly
Riparian Assessment		annually

6.1.4 Indicators Framework & Indicators

A framework of indicators is designed as a continual process of identification, preparation, decision-making, implementation and evaluation of interventions. Indicators would serve the purpose to structure and facilitate this process, to monitor it and make it accountable. Indicators should thus provide concrete and meaningful information of conditions and changes over time of input into the process of coastal development and their output and outcome.

The National Land and Water Resources Audit (the Audit), established in 1997 under the Natural Heritage Trust Act, was responsible for developing key indicators for the Natural Resource Management M&E Framework, used to assess progress towards improved natural resource condition. The Audit was responsible for the development of indicators, as well as supporting the national collection and collation of data, and reporting against each indicator.

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The National NRM Monitoring and Evaluation Framework (NM&EF) called for the identification of key topics or 'matters for target'. Each matter for target has a set of 'indicators' that will be used to monitor and report on the topic.

A total of 19 nationally agreed indicators were developed to measure the effect of the stressors on ecosystem condition (physical/chemical and biological) and habitat extent.

Matter for target/topic:	Estuarine, Coastal & Marine Habitat Integrity
Indicator heading:	Indicators
Estuarine, coastal and marine habitat extent and distribution	1. Extent/distribution of key habitat types
Estuarine, coastal and marine habitat condition	<p><i>Biological condition:</i></p> <ol style="list-style-type: none"> 2. Algal blooms 3. Animal or plant species abundance 4. Chlorophyll a 5. Coral bleaching 6. Cass mortality events 7. Pest species (number, density, distribution) 8. Targeted pathogen counts 9. Vertebrates impacted by human activities <hr/> <p><i>Physical/chemical condition:</i></p> <ol style="list-style-type: none"> 10. Dissolved oxygen 11. Nutrients 12. pH 13. Presence / extent of litter (marine debris) 14. Salinity (EC) 15. Sedimentation/erosion rates 16. Shoreline position 17. Temperature 18. Toxicants (in water / sediments/ biota) 19. Turbidity / water clarity

Source: The National Land & Water Resources Audit (2008)

6.1.5 Proposed Indicators for Manly's Coastal & Estuarine Program

A long-term monitoring program is considered to be designed on the EHMP of the 'Healthy Waterways Program' and using Council's experience with Recreational Water Quality Monitoring Program. An indicator framework for Manly is proposed essentially based on the National NRM Monitoring and Evaluation Framework (NM&EF) and reviewing indicators currently being used under different programs in Manly including SoE Reporting.

Table 6.1.5 Proposed Indicators to monitor Manly's Estuarine, Coastal & Marine Habitat Integrity

Indicator heading	Indicators	Frequency	Remarks
Habitat Extent & Quality	1. Seagrass distribution and % cover		



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Indicator heading	Indicators	Frequency	Remarks
	2. Mangrove distribution and % cover		
	3. Beach indicators		
	4. Isohaline position	1-5 years	
	5. Riparian assessment		
	6. Rocky shore assessment		
	7. Intertidal species diversity/abundance??		
Sedimentation Processes	8. Sedimentation/erosion rates	Annual monitoring preferably after the wet season.	
	9. Shoreline position		
Climate Change	10. Saline intrusion into groundwater aquifers		
	11. King tide levels/inundation events		
	12. Days >35°C		
Biotic Indicators	13. Algal blooms		
	14. Animal or plant species abundance		
	15. Chlorophyll a	Annually	
	16. Pest species (number, density, distribution)	at least every three months (i.e. summer, autumn, winter and spring).	
Water Quality	17. Dissolved oxygen	monthly basis on the falling tide	
	18. Nutrients Concentration of oxidised nitrogen. Concentration of organic nitrogen. Concentration of ammonia. Concentration of total nitrogen. Concentration of filterable reactive phosphorus. Concentration of total phosphorus.	Monthly	
	19. pH		
	20. Salinity (EC)	Monthly	
	21. Temperature	Monthly	
	22. Turbidity / water clarity Turbidity of a waterbody. Secchi depth of a waterbody.	monthly on the falling tide.	
	23. Sewage Plume Map (Algae $\delta^{15}\text{N}$ Mapping)		
	24. Presence / extent of litter (marine debris)*	at low tide every three months over a one-year period.	
Pollution	25. Toxicants (in water / sediments / biota)	Annual	

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Indicator heading	Indicators	Frequency	Remarks
	1: Concentrations of toxicants in sediments of an estuarine or coastal waterbody. 2: Concentrations of toxicants in waters of an estuarine or coastal waterbody. 3: Concentrations of toxicants in biota of an estuarine or coastal waterbody.		
	26. Sediment quality (i.e. heavy metals, dioxins etc)	3 years	
	27. Bioaccumulation assessment using oyster	3 years	

6.1.5 Proposed Monitoring System

Objectives

- Design a long-term monitoring set-up to assess environmental health across Manly's coastal environment
- To draft Manly Monitoring, Evaluation & Reporting Plan for coastal & estuary management
- Finalise Indicators & establish a baseline
- Establish an in-house laboratory

Activities & Output

- Monitoring, Evaluation & Reporting (MER) Plan for coastal & estuary management.

The MER Plan will provide evidence of a documented monitoring and evaluation approach. The document should indicate appropriate monitoring and evaluation design, taking into account the specific outcomes and targets being measured and the relevant variables. The document should indicate appropriate analysis of data and justification of conclusions. Monitoring and evaluation should be used as a tool for corrective and preventative action and continual improvement. The process of developing the MER would involve the following:

- Internal staff liaison
- Stakeholder liaison (OEH, SMCMA, SCCG)
- Draft MER Plan
- In-house workshops to discuss the draft
- Stakeholder Review
- Draft Final MER Plan
- Present to Harbour Foreshore & Coastline Management Committee then to Council for adoption.

OUTPUT : MER Plan

- Identification of Sample Site & establish baseline data

Sampling sites should be aligned to sub-catchments. Manly LGA has 19 sub-catchments of which 16 are directly adjacent to coastline, lagoon or estuary. At least one sample site should be considered for each catchments of Manly LGA.

- Review Manly LGA catchment map
- Identify 20-25 sites, incorporating 10-11 existing sample sites
- Map sites using GPS
- Collect samples & carry out laboratory tests
- Establish baseline

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OUTPUT : Baseline

3. Establishment of monitoring facilities and collaborative partnerships
 - a) Analyse cost benefit of undertaking analysis in-house or through an external independent laboratory
 - b) Establish in-house water quality tests set up.
 - c) Purchase softwares for Riparian assessment
 - d) Establish collaboration with Universities through MoU mechanism
 - e) Encourage community participation and organise training if needed

OUTPUT : Monitoring facilities & linkages

4. Analyse results, modify technique, review coastline/estuary management

OUTPUT : Trend, modify coastline/estuary management

6.2 PERFORMANCE EVALUATION

The Harbour Foreshore & Coastline Management Committee will assist staff in directing established review and evaluation processes. These processes will assess the performance of the Coastal Zone Management Plan and ensure it is continually updated and improved. A Performance Evaluation Program, to be developed as per the CZMP, will propose an integrated program showing the relationships between recommended actions, performance indicators to be monitored, data interpretation methodology, and targets for actions where baseline data is available. This detailed evaluation program shall be consistent with NRC (Natural Resources Commission) and Sydney Metropolitan CMA reporting protocols clearly defining estuary and management targets.

Quadruple Bottom Line (QBL) accounting, currently being used within the Manly Council, is the process of identifying, assessing and reporting business activities in terms of their impact on society, the environment, economic sustainability and governance. This reporting process is based on continuous improvement, and Council aims to produce a good quadruple bottom line result today and to provide an even better result tomorrow. With the adoption of the Community Strategic Plan in 2011, Council is undertaking a full review of current QBL reporting to further integrate the QBL process into Council operations to assist in improving the sustainability outcomes of operational decisions.

A standardised reporting format should be utilised on an annual basis to briefly evaluate the progress of the plan and the efficiency and effectiveness of management options implemented over each annual reporting period.

6.3 REPORTING MECHANISM

Reporting on the implementation of the plan through time is to be achieved through the three following mechanisms.

Harbour Foreshore & Coastline Management Committee

Manly Harbour Foreshores & Coastline Management Committee is the primary Committee responsible for overseeing the on-going implementation of the Plan. Regular bi-monthly meetings of the Committee will be held where on-going actions and any variations to the plan will be reported. This way all key stakeholders represented on the Committee will be kept abreast of the on-going implementation of the programs. Some specific items are referred, either as brief mention or full report, to Council's monthly Planning & Strategy Committee meetings.

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Reporting to the Community

Progress on implementation of the CZMP and/or specific achievements will be reported through an existing dedicated page on Council's website. This Coastal Zone Management Plan and all supporting documents, when adopted, are posted on this site. Selected items will be contributed to Precincts for publication in Precinct Forum Newsletter. Brief reporting will be made to Council's annual Report to the Community.

Other Formal & informal Reporting Processes

Reporting on the progress of implementation of the CZMP will be made, among others, through:

- Annual Report
- Environment Levy Report
- State of the Environment Report
- Sydney Coastal Councils Group's monthly e-news updates 'Making Waves' and quarterly newsletter

Internally, progress are discussed during weekly Branch's 'Works in Progress (WIP)' and monthly Divisional meetings and reported monthly in 'General Manager's report. Further reporting is also made to requirements of individual grant funding agencies.

7. GLOSSARY

Accreted Profile	The profile of a sandy beach that develops in the "calm" periods between major storm events. During such periods, swell waves move sediment from the offshore bar back onto the beach to rebuild the beach form.
Accretion	A build up of sand which may cause or be associated with a seaward movement of the beach profile.
Aeolian Transport	Transport (of sand) by wind.
Bathymetry	Description of the shape of the ocean bed (underwater contours etc.). The measurement of depths of water.
Beach	The area of unconsolidated material between the lowest limit of tidal or lake water level and the highest level reached by wave action (i.e. both open coast and estuary foreshores).
Beach berm	That area of shoreline lying between the swash zone and the dune system.
Beach erosion	The offshore movement of sand from the sub-aerial beach during storms.
Beach nourishment	The supply of sediment by mechanical means to supplement sand on an existing beach or to build up an eroded beach.
Beach Profile	A cross-section of a beach, generally normal to the water line, showing the elevation of the surface relative to some datum. It may also extend some distance offshore.
Benthic	Pertaining to the seafloor (or bottom) of a river, coastal waterway, or ocean.
Bluff	Vertical or near vertical cliff face (relatively erosion resistant rock) or moderate to steep slope (less erosion resistant rock or soils perched on rock strata).
Breaker Zone	That area of coastal waters where shoaling effects cause swell waves to break. This typically occurs in the shallower waters over an offshore bar.
Breaking Waves	As waves increase in height through the shoaling process, the crest of the wave tends to speed up relative to the rest of the wave. Waves break when the speed of the crest exceeds the speed of advance of wave as a whole. Waves can break in three modes: spilling, surging and plunging.
Breakwater	Structure protecting a shoreline, harbor, anchorage or basin from ocean waves.
Buffer Zone	An appropriately managed and unalienated zone of unconsolidated land between beach and development, within which coastline fluctuations and hazards can be accommodated in order to minimise damage to the development.
Catchment	The area of land which collects and transfers rainwater into a waterway.
Coastal hazard	'Coastal hazard' is defined in the <i>Coastal Protection Act 1979</i> (section 4) and means the following: a) beach erosion b) shoreline recession c) coastal lake or watercourse entrance instability d) coastal inundation

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	<ul style="list-style-type: none"> e) coastal cliff or slope instability f) tidal inundation g) erosion caused by tidal waters, including the interaction of those waters with catchment floodwaters.
Coastal inundation	Coastal inundation is the storm-related flooding of coastal lands by ocean waters due to elevated still water levels (storm surge) and wave run-up.
Coastal Process	The active forcing functions (waves, winds, currents etc.) and their interaction with and effects on the coastal environment (sediments, beach and cliff erosion etc.)
Coastal Structures	Those structures on the coastline designed to protect and rebuild the coastline and/or enhance coastal amenity and use.
Coastal Zone	<p>Statutory definition – Coastal zone is defined in the <i>Coastal Protection Act 1979</i> (section 4).</p> <p>Bio-physical definition – The coastal zone encompasses the interface between land and sea. It is a zone of interaction between terrestrial and marine systems and processes. Within this zone there is a wide variety of landscapes and habitats, including beaches, headlands, rock platforms, dunes, foreshores, estuaries and marine waters.</p>
Corridor	Lines of native vegetation connecting separate habitat areas that are essential for maintaining biodiversity. Corridors enable fauna to access larger habitats by encouraging mobility between areas. Corridors may also assist native plant species to spread and colonise new areas over time.
Diffraction	The “spreading” of waves into the lee of obstacles such as breakwaters by the transfer of wave energy along wave crests. Diffracted waves are lower in height than the incident waves.
Dune management	The general term describing all activities associated with the restoration and maintenance of the role and values of beach dune systems. Dune management activities and techniques include planning, dune reconstruction, revegetation, dune protection, dune maintenance and community involvement.
Emergency coastal protection works	Sand or sandbags placed on a beach to reduce beach erosion impacts in accordance with the <i>Coastal Protection Act 1979</i>
Entrance instability	Refers to the tendency of entrances to estuaries and coastal lakes to migrate along the shore, close up, reopen, form new entrances, etc. in response to wave and current action and freshwater flows.
Erosion	The depletion of the land mass by natural forces, such as the reduction of a beach by waves and/or wind. Commonly perceived as the landward movement of an erosion escarpment during storm events.
Erosion Escarpment	A near vertical step formed by wave erosion at the back of a beach. Usually indicates the landward extent of wave incursion during recent storm events.
Escarpment	The landward limit of erosion in the dune system caused by storm waves. At the end of a storm the scarp may be nearly vertical; as it dries out the scarp slumps to a typical slope of 1 vertical:1.5 horizontal. Also known as the ‘scarp’, ‘dune scarp’ and ‘backbeach erosion’.



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Estuary (definition 1)	The tidal portions of river mouths, bays and coastal lagoons, irrespective of whether they are dominated by hyper saline, marine or fresh water conditions
Estuary (definition 2)	a semi enclosed coastal body of water which has a free connection with the open sea and within which sea water is measurably diluted with fresh water derived from land drainage
Flushing	Exchange of water between an estuary or coastal waterway and the ocean.
Frictional Attenuation	As applied to water waves, the reduction in wave energy as a result of resistant to water particle movement at the sea bed (bottom friction).
Groynes	Low walls built perpendicular to a shoreline to trap longshore sediment. Typically, sediment build up on the up drift side of a groyne is offset by erosion on the down drift side.
Hazard	Occurrence or change in a set of circumstances relating to the physical aspects of coastal processes. To constitute a hazard, the change gives rise to a potential negative impact on life or property located within close proximity to the coastline.
Intertidal	The environment between the level of high tide and low tide.
Likelihood	The chance of something happening.
Littoral Drift	The sedimentary material which is moved in the littoral zone by waves and currents.
Littoral Transport	The movement of littoral drift.
Littoral Zone	Extends from the onshore dune system to the seaward limit of the offshore zone and possibly beyond.
Longshore Currents	Currents flowing parallel to the shore within the inshore and nearshore zones. Longshore currents are typically caused by waves approaching the beach at an angle. The "feeder" currents to rip cells are another example of longshore currents.
Longshore Transport	Synonymous with LITTORAL TRANSPORT.
Mud	Fine sedimentary material, typically comprising both inorganic (mineral) and organic material.
Nearshore Zone	Coastal waters between the offshore bar and the 60 m depth contour.
Net	With respect to sediment transport is the resultant difference of the volume of transport in all directions, i.e. the time averaged resultant effect.
Nourishment	The replenishment of a beach with sand. Commonly used to increase the beach width after erosion.
Offshore Bar	Submerged sandbar formed offshore by the process of beach erosion and accretion. Typically, swell waves break on the offshore bar. Also known as longshore bar.
Offshore Zone	Coastal waters to the seaward of the nearshore zone.
Onshore/Offshore Transport	The process whereby sediment is moved onshore and offshore by wave, current and wind action.

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Organic Material	Once-living material (typically with high carbon content), mostly of plant origin.
Refraction	The tendency of wave crests to become parallel to bottom contours as waves move into shallower waters. This effect is caused by the shoaling process which slows down waves in shallower waters.
Rip Currents	Concentrated currents flowing back to sea perpendicular to the shoreline. Rip currents are caused by wave action piling up water on the beach. Feeder currents running parallel to the shore (longshore currents) deliver water to the rip current.
Risk	Effect of uncertainty on objectives, usually characterised by reference to potential hazards and their consequences, or a combination of these. It is also expressed as a combination of consequences of a hazard and the associated likelihood of occurrence.
Sand drift	The movement of sand by wind. In the context of coastlines, 'sand drift' is generally used to describe sand movement resulting from natural or human-induced degradation of dune vegetation, resulting in either nuisance or major drift. Sand drift can damage buildings, roads, railways and adjoining natural features such as littoral rainforest or wetlands. Sand drift can be a major coastline hazard.
Seagrass	Marine flowering plants which generally attach to the substrate with roots.
Seawalls	Walls built parallel to the shoreline to limit shoreline recession.
Sediment Budget	An accounting of the rate of sediment supply from all sources (credits) and the rate of sediment loss to all sinks (debits) from an area of coastline to obtain the net sediment supply/loss.
Sediment transport	The process whereby sediment is moved onshore and offshore by wave, current and wind action.
Sediments	Unconsolidated detrital material consisting of organic and/or inorganic fragments. The composition and textural characteristics (gravel, sand, mud) vary with sediment source (local, fluvial, marine) and the transporting medium.
Semi-diurnal Tide	Tides with a period, or time interval between two successive high or low waters, of about 12.5 hours. Tides along the New South Wales coast are semi-diurnal.
Shoreline Recession	A net long term landward movement of the shoreline caused by a net loss in the sediment budget.
Spilling Waves	The wave crest breaks gradually as the wave travels to the shore. Characterised by the appearance of white water at the crest.
Spring Tide	A tide greater than the mean tidal range. Occurs about every two weeks, when the Moon is full or new.
Storm Bar	An offshore bar formed by sediments eroded from the beach during storm conditions.
Storm Profile	The profile of a sandy beach that develops in response to storm wave attack. Considerable volumes of sediment form the beach berm, the incipient dune and the foredune can be eroded and deposited offshore. The landward limit of the storm profile is typically defined by a backbeach erosion escarpment.

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Storm Surge	The increase in coastal water level caused by the effects of storms. Storm surge consists of two components: the increase in water level caused by the reduction in barometric pressure (barometric setup) and the increase in water level caused by the action of wind blowing over the sea surface (wind setup).
Subaerial	That section of the beach which is above the waterline.
Subaqueous	The portion of the beach profile below the water surface.
Surging Waves	The wave does not "break" but maintains its basic shape as it moves towards the shore, where it surges up the beach. Very little white water is evident before surging waves reach the shore.
Swell	Wind-generated waves that have travelled out of their generating area. Swell characteristically exhibits a more regular shape and longer period than the sea (c.f. SEA).
Swell Waves	Wind waves remote from the area of generation (fetch) having a uniform and orderly appearance characterised by regularly spaced wave crests.
Tidal inundation	The inundation of land by tidal action under average meteorological conditions and under any combination of astronomical conditions.
Turbidity	The condition resulting from the presence of suspended particles in the water column which attenuate or reduce light penetration.
Training walls	Walls constructed at the entrances of estuaries and rivers to improve navigability.
Tsunami	Long-period ocean waves generated by geological and tectonic disturbances below the sea. Incorrectly referred to as 'tidal waves', tsunami travel at speeds of up to 800 kilometres/hour in the open ocean, where they are of low height. However, tsunami can rise to a height of 10 metres or more through the shoaling process as they approach land.
Wave Height	The vertical distance between a wave trough and the following wave crest.
Wave Period	The time taken for consecutive wave crests or wave troughs to pass a fixed point.
Wavelength	The distance between consecutive wave crests or wave troughs.
Wave run-up	The vertical distance above mean water level reached by the uprush of water from waves across a beach or up a structure.
Wind Waves	The waves initially formed by the action of wind blowing over the sea surface. Wind waves are characterised by a range of heights, periods and wavelengths. As they leave the area of generation (fetch), wind waves develop a more ordered and uniform appearance and are referred to as swell or swell waves.
Wetlands	A wetland is an area of land whose soil is saturated with moisture either permanently or seasonally. Wetlands include swamps, marshes, billabongs, lakes, saltmarshes, mudflats, mangroves, coral reefs, fens, peatlands, or bodies of water — whether natural or artificial, permanent or temporary. Water within these areas can be static or flowing, fresh, brackish or saline.



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APPENDIX A: MANAGEMENT AGENCIES

Integrated Coastal Zone Management (ICZM) is a management regime defined and directed by broader policy and organisational settings, in turn influenced by the prevailing institutional system. It is important to understand roles and responsibilities, direct and indirect, of institutional stakeholders. Like policy environment, institutional stakeholders also come from three levels of governments.

Local and regional

Manly Council (MC) is the principal management agency of this plan.

Manly Council was incorporated as a local government body on 6th January, 1877. Manly Council is a statutory body deriving authority from the *Local Government Act 1993* and other Acts enacted by the Parliament of New South Wales. The Council does not have the power to make decisions outside the legislation by which it derives its authority.

Council is responsible for the overall management of the Local Government Area (LGA) and enforcing the requirements of the *NSW Local Government Act 1993*, *Environmental Planning and Assessment Act 1979* and the *Crown Lands Act 1989* (where Council has care and control).

Manly Council is run by 12-member elected Councillors headed by the Mayor. Council is supported by the executive General Manager and staff. Councillors are elected to Council at local government elections, which are held every four years. In Manly local government area, there are no wards, and each Councillor represents the entire Council area. The Mayor is also directly elected by community for a term of 4 years.

Manly Council is committed to community consultation, a key component of which is the committee-based **Precinct Community Forums** system. The forum approach was introduced in 1990 to extend the involvement of the community through coordinated consultation and participation. The aim is to involve all property owners, residents and workers in the decisions which affect their local area. Precinct Community Forums are groups of people who live, work or own property in a Precinct area. There are 12 Precinct Community Forums in Manly Council area and Precinct meetings are held monthly. The meetings discuss matters referred by Council for community consultation, and matters of local importance and interest to the community. The decisions of the Precincts are advisory. Their comments are responded to and considered by Council in its statutory decision making role. The Community Forums are organised by the residents. They play a vital role in ensuring that future changes in the local area are taken into account, and are sympathetic to the amenity of the local residents.

Another operational arm of the Council is various Special Purpose Committees and Working Groups. Manly Harbour Foreshore & Coastline Management Committee is one of these committees, which oversees the development of the Manly Cove Coastal Zone Management Plan. The Committee meets bi-monthly.

SHOROC (the Shore Regional Organisation of Councils) is a cooperative group of Councils on Sydney's Northern Beaches representing Manly, Mosman, Pittwater and Warringah. SHOROC was launched in August 1994 in the belief they had significant shared features that would provide more opportunities for information and resource sharing and joint servicing at a local level. The SHOROC Executive plays a strong role in presenting regional issues effectively to all levels of government. SHOROC operates through a Board, made up of the four Mayors and four General Managers who meet at least quarterly. All member councils make an equal annual contribution to the operating costs of SHOROC and have equal voting rights.

The SHOROC Board is supported by a Management Committee, a Secretariat and a number of key working groups comprising cross council professional officers. SHOROC projects are diverse and divided between four portfolios – Planning, Environment, Community and Corporate. Publication of 'Regional State of the Environment' Report is one of the key documents produced by SHOROC each year. The Report contains a chapter of 'Land and Coastline'.

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The **Sydney Metropolitan Catchment Management Authority (SMCMA)** is a NSW Government agency working to meet community expectations by delivering natural resource management across Sydney. Natural resources include land, rivers, estuaries and coastal systems. The SMCMA meets its government and legislative expectations by implementing the Sydney Metropolitan Catchment Action Plan. This is a strategic planning tool that identifies the key natural resource features the Sydney community wants to protect and improve. The SMCMA was established under the *Catchment Management Authorities Act 2003*. The SMCMA partners with 39 local councils in the metropolitan catchment as well as State and Federal Government departments.

The **Sydney Coastal Councils Group** was established in 1989 to promote co-ordination between member councils on environmental and natural resource management issues relating to the sustainable management of the urban coastal environment.

The Group consists of 15 councils (Botany Bay, Hornsby, Leichhardt, Manly, Mosman, North Sydney, Pittwater, Randwick, Rockdale, Sutherland, City of Sydney, Warringah, Waverley, Willoughby and Woollahra) adjacent to Sydney marine and estuarine environments and associated waterways. The Group represents over 1.3 million Sydneysiders. This area encompasses the waterways of Broken Bay; Pittwater; Port Jackson, the lower Lane Cove River, Middle and North Harbours; Botany Bay, the Lower Georges and Cooks River; and Port Hacking.

The Sydney Coastal Councils Group is a Regional Organisation of Councils that provides project facilitation and coordination on environmental and natural resource management issues that relate to the sustainable management of the coastal urban environment. The Group provides strong advocacy and support for its 15 member councils on coastal, climate change and NRM issues. Being a member council also allows council elected and professional staff the opportunity to exchange ideas at a regional level through SCCG forums, presentations, meetings and conferences.

The **Aboriginal Heritage Office** is a joint initiative by Lane Cove, North Sydney, Manly, Warringah, Willoughby, Ku-ring-gai and Pittwater councils, in a progressive move to protect Aboriginal Heritage in these areas. Part of the work of the Aboriginal Heritage office is to monitor Aboriginal Sites on a day to day basis and long term management reports are developed to ensure their preservation and protection.

Another key role of the Aboriginal Heritage office is to give the Aboriginal people and non-aboriginal people involved with these council areas an avenue of approach to discuss issues or concerns they may have. The office is in direct contact with the Metropolitan Local Aboriginal Land Council and its many resources.

An important part of the role is to communicate with school and other groups and teach children an ethos of understanding to appreciate the unique culture of the Aboriginal people. In association with the local councils, talks, walks and activities are planned to enhance appreciation of Aboriginal culture in the wider community. A selection of information leaflets on various Aboriginal Heritage topics are available to download from AHO's website.

State

The **Department of Planning & Infrastructure** supports sustainable growth in NSW. It is responsible for:

- Long-term planning for the State's regions;
- Driving well-located housing and employment land;
- Assessing the State's biggest development proposals; and
- Ensuring the planning system is streamlined and effective

In May 2009, the Department established three divisions focussing on key activities in planning – land release, urban renewal and major project assessment. A fourth division focuses on corporate governance and policy development.

The functionality of the Department is run under the following seven Executive Directors:

- Corporate Governance & Policy

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- Strategy & Infrastructure Planning
- Land Release
- Planning Operations
- Urban Renewal & Major Sites
- Major DA Assessment
- Assessments Systems, General Counsel

In developing its roles and responsibilities, the Department identifies the following priorities:

- Sustainable growth in the right locations
- Improved investor and community confidence
- Effective management of natural, environmental and cultural resources and values
 - Protection for the New South Wales coastline from inappropriate development through the NSW Government's Coastal Policy, State Environmental Planning Policy No. 71 - Coastal Protection, the Comprehensive Coastal Assessment and the Coastal Lands Protection Scheme. Coastal wetlands, littoral rainforests and areas with acid-sulfate soils also need special attention if development is being considered.
 - Protection for other areas of high environmental value. For example, our drinking water catchment plan will protect the drinking water for Sydney and nearby regional centres
- Diverse, equitable and pleasant neighbourhoods which reflect community needs and aspirations
- Integrated delivery of regional infrastructure and government activities

Environmental planning instruments (State environmental planning policies, regional environmental plans and local environmental plans) are legal documents that regulate land use and development. Local environmental plans prepared by councils guide planning decisions for local government areas. Through zoning and development controls, they allow councils to supervise the ways in which land is used. Development control plans, prepared in accordance with the *Environmental Planning and Assessment Act*, are also used to help achieve the objectives of the local plan by providing specific, comprehensive requirements for certain types of development or locations e.g. for urban design, and heritage precincts and properties.

Planning and development within the NSW Coastal Zone (as declared under the *Coastal Protection Act 1979*) is now subject to a Ministerial direction for coastal protection, NSW Coastal Policy, SEPP 71 - Coastal Protection, and the Major Projects SEPP (which identifies coastal development that will need the approval of the Minister for Planning). The NSW Government in June 2001 announced its \$11.7 million Coastal Protection Package to protect the State's beaches, headlands and other coastal features for generations to come.

The Department has released the final NSW coastal planning guideline: adapting to sea level rise following extensive public consultation. The Guideline adopts the NSW sea level rise planning benchmarks in the NSW Sea Level Rise Policy Statement. The Guideline outlines a proposed approach to assist councils, State agencies, planners and development proponents when addressing sea level rise in land-use planning and development assessment. It applies to all coastal areas of NSW, including the NSW Coastal Zone, as well as Sydney Harbour and Botany Bay. The term 'coastal areas' is used broadly to include the coastline, beaches, coastal lakes, estuaries, as well as the tidal reaches of coastal rivers. It also includes other low-lying land surrounding these areas that may be subject to coastal processes in the future as a consequence of sea level rise.

In a recent restructuring (April 2011), with the abolition of Land & Property Management Authority, Office of Strategic Lands staff are transferred to Department of Planning and Infrastructure.

The Department of Primary Industries (NSW DPI) has been established to assist in building a diversified state economy that creates jobs. The department was formed in July 2004 with the amalgamation of Mineral Resources NSW, NSW Agriculture, NSW Fisheries and State Forests NSW. The Department was during 2009 - 2011 amalgamated with and acted as Industry & Investment NSW.

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One of the Divisions, 'Fisheries, Compliance and Regional Relations', manages and promotes sustainable, commercial and recreational use of NSW fisheries' resources, and the protection of the aquatic environment.

The Division has jurisdiction over all fish and marine vegetation in all waters of the state (including all private and public waters and permanent and intermittent waters) extending to 3 nautical miles offshore (and to 80Nm offshore in those fisheries for which it has jurisdiction under the Offshore Constitutional Settlement). This means that it has management responsibility for all aquatic animals (with the exception of aquatic mammals, reptiles, amphibians and birds, which are managed by the NSW Office of Environment & Heritage) and responsibility for all marine vegetation and key aquatic habitats including seagrass, mangroves, gravel beds and snags. It has also management and research responsibilities related to threatened fish species, populations and ecological communities.

While NSW DPI is responsible for the management of all aquatic animals, the department is a state government authority with limited on-the-ground staff to effectively regulate the management of aquatic environments. As a result Manly Council's rangers are presently licensed as NSW DPI (Fisheries) officers to assist Fisheries with some of their on-the-ground 'localised' regulation functions.

In a recent restructuring (April 2011), the following office and/or groups are added to the Department of Primary Industries. with the abolition of

- Staff principally involved in the administration of the Crown Lands Act and Soil Conservation Act from the Land & Property Management Authority;
- Staff principally involved in the management or administration of spatial data from the Land & Property Management Authority;
- Office of Water,
- Marine Parks Authority Secretariat,
- the group of staff who, in the opinion of the Director-General of Premier and Cabinet, are principally involved in the administration of the *Catchment Management Authorities Act 2003*.

The NSW Office of Water is responsible for the management of the State's surface water and groundwater resources. The Office of Water reports to the NSW Government for water policy and the administration of key water management legislation, including the *Water Management Act 2000*, *Water Act 1912*, and the *Hawkesbury-Nepean River Act 2009*.

The **Office of Environment and Heritage (OEH)** is a separate office within the NSW Department of Premier and Cabinet. OEH is an environmental regulator and a manager of parks and gardens in NSW and develops and leads policy and reform in sustainability, biodiversity and native vegetation, coastal protection and Aboriginal cultural heritage.

OEH manages 6.8 million hectares of national parks and reserves, which is almost 9 per cent of NSW.

In regulatory matters for environment protection, OEH acts under the powers of the statutory Environment Protection Authority (EPA) and its Board.

The organisation also provides staff, services and other support to the Royal Botanic Gardens and Domain Trust, the NSW Environmental Trust and the Lord Howe Island Board.

The Heritage Office works with communities to identify important places and objects and provides guidance in looking after heritage items.

OEH supports the Premier, the Minister the Environment and the Minister for Heritage in performing their executive and statutory functions.

OEH was formerly known as the Department of Environment, Climate Change and Water (DECCW).

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Coastal and estuary management programs

The NSW Government's Coastal Management Program's primary objective is to provide support to local councils to manage the risks from coastal hazards such as coastal erosion. A secondary objective of the program is to restore degraded coastal habitats. The primary objective of the Government's Estuary Management Program is to provide support to councils to improve the health of NSW estuaries and understand the potential risks from climate change.

The support provided to councils under these programs includes financial assistance to:

- prepare coastline, estuary and coastal zone management plans and supporting studies
- carry out projects to reduce risks associated with coastal hazards, improve coastal environments and improve estuary health.

A review of these programs has resulted in a revised focus on funding, with a greater emphasis placed on:

- updating coastal hazard studies to incorporate sea-level rise benchmarks
- updating estuary plans to consider climate change impacts, including sea level rise
- estuary health monitoring and improvement
- focusing on high-hazard coastal areas and stressed estuaries.

Grant offers are subject to availability of funds for each financial year and State-wide priorities. Funding of up to 50% of a project's costs will normally be offered for successful grant applications.

The NSW National Parks and Wildlife Service (NPWS), which forms part of the Office of Environment and Heritage, is responsible for protecting the State's flora and fauna, and for managing and maintaining National Parks and Nature Reserves. The NPWS is also responsible for Aboriginal Heritage and sites.

NSW Maritime is the State Government Authority responsible for marine safety, regulation of commercial and recreational boating and oversight of port operations. The Authority is also responsible for property management of submerged lands in Sydney Harbour, Newcastle Harbour, Botany Bay and Port Kembla, and for providing strategic advice on ports and maritime matters to the NSW Government.

NSW Maritime was created in 2004, replacing the Waterways Authority and the Marine Ministerial Holding Corporation. To better serve the boating community NSW Maritime has four key result areas as the focus for its endeavours:

- Boating Safety – develop and promote a safe commercial vessel and recreational boating culture through a comprehensive safety and compliance program involving education about safe boating practices, and through enforcement of laws
- Maritime Infrastructure – improve public access to waterways, including access for people with disabilities, ensure safe public ferry wharves, and encourage and promote maritime precinct developments which meet community expectations and help create maritime related jobs
- Safe and Competitive Ports – provide co-ordinated support for port policy and development, and ensure ports operate under effective port safety management arrangements
- Community Involvement – seek key stakeholder and community involvement in decisions that affect them, promote transparency and consistency in decision making and reduce red tape.

NSW Maritime the government body which owns the seabed of Sydney Harbour, North Harbour and Middle Harbour and all related tidal bays, rivers and their tributaries. Under the *Ports Corporatisation and Waterways Management Act 1995 (PC&WM Act 1995)* the Waterways Authority (NSW Maritime) is the landowner of Sydney Harbour and its tributaries and therefore controls Sydney Harbour.

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NSW Maritime is therefore responsible for management of waterways and the sea bed from mean high water mark (MHWM) seaward. As owner of the bed of Sydney Harbour, NSW Maritime is the consent and determining authority for a variety of water-based developments and activities. NSW Maritime is also responsible for the investigation of on-water pollution incidents and issuing clean-up and prevention notices in relation to vessels (in navigable waters that are not required to have a pilot).

From 4 February 2008, most DAs lodged with NSW Maritime seeking consent for water based development under Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 are likely to be 'integrated development applications' because the development is likely to require a controlled activity approval under the *Water Management Act 2000*.

The change in the DA requirements is a result of the repeal of the *River and Foreshores Improvement Act 1948* and commencement of the controlled activity provisions of the *Water Management Act 2000*.

Under the *Water Management Act 2000*, controlled activities include the erection of a building or the carrying out of a work or the removal or deposition of material and approval is required where the work is carried out in, on or over the bed of any river, lake or estuary.

Once lodged with NSW Maritime, special advertising and notification procedures apply to these DAs under the *Environmental Planning and Assessment Act 1979*. These require a minimum public display period of 30 days, a public notice in a local newspaper and notifications to relevant public authorities and neighbours.

NSW Maritime's DA form has been updated so that the integrated referral(s) requirement can be identified. If relevant, other integrated approvals may also continue to be required, for instance, approvals required under the *Fisheries Management Act 1994*.

The **Land and Property Management Authority (LPMA)**, is abolished as a Division of the Government Service as part of the NSW Government restructure announced on April 4, 2011 and has largely been incorporated into other departments. Crown Lands Division is now housed in the Department of Primary Industries.

Sydney Water, a statutory State owned corporation, wholly owned by the New South Wales Government has three equal, principal objectives:

- to protect public health
- to protect the environment
- to be a successful business.

Sydney Water provides drinking water, recycled water, wastewater services and some stormwater services to more than four million people in Sydney, Illawarra and the Blue Mountains. Drinking water is sourced from a network of dams managed by the Sydney Catchment Authority, then treated and delivered to customers' homes and businesses by Sydney Water.

Sydney Water has Memoranda of understanding with

- the Office of Environment and Heritage (OEH)
- NSW Health

The **Natural Resources Commission (NRC)** was created by the Natural Resources Commission Act 2003. The Natural Resources Commission (NRC) provides credible, independent advice to the NSW Government on managing the state's natural resources in an integrated manner to maintain landscapes that are resilient, function effectively, and support environmental, economic, social and cultural values. The NRC reports to the Premier, reflecting its independent nature.

In 2005, the NRC developed and recommended a Standard for Quality Natural Resource Management (Standard) and state-wide targets for NRM. The Government adopted the Standard and targets, and the targets

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are now part of the 'Green State' Priorities and Targets of the NSW State Plan. In 2008, the NRC began an ongoing program of audits to assess whether Catchment Action Plans are being implemented effectively, in compliance with the Standard and targets.

Together, the Standard, targets, and audit support flexible and innovative regional decision-making, and build consistency, rigour and accountability for NRM. 2010 marks five years of implementation of the Standard and targets. To drive continual improvement the NRC will undertake a mid term review of the Standard, targets and Catchment Action Plans and the regional model.

The NRC will contribute to achieving the targets of the NSW State Plan by advising the Government on:

- the natural resource policy and management settings required to improve the resilience of landscapes
- how to improve performance towards the state-wide targets and the effective implementation of Catchment Action Plans.

The NRC, at present, follows the Strategic Plan 2010-2013.

The functions of Emergency Management NSW have been transferred to the **Ministry for Police and Emergency Services**. The Ministry for Police and Emergency Services is a division of the Department of Attorney General and Justice. It is responsible to the Minister for Police and Emergency Services.

The Ministry was formed on 4 April 2011 as part of new administrative arrangements for the NSW public service outlined in the *Public Sector Employment and Management (Departments) Order 2011*.

The Ministry brings together the functions of the former Security and Recovery Co-ordination Branch and Law Enforcement Policy Branch of the Department of Premier and Cabinet, the Disaster Welfare section the Department of Human Services and Emergency Management NSW.

Emergency Management involves a range of programs and arrangements designed to prevent, prepare for, respond to and recover from the effects of hazards impacting on the community.

The *State Emergency Management Committee (SEMC)* was established under the *State Emergency and Rescue Management Act* to ensure that New South Wales has a system to cope with emergencies which is robust, effective and flexible enough to deal with the range of hazards experienced in New South Wales. A hazard impacting on the community may result in an emergency.

The *State Rescue and Emergency Management Act* identifies the SEMC as being responsible for the following emergency management activities:

- identify, evaluate and monitor hazards and threats to life and property;
- establish and review appropriate emergency management structures at all levels;
- identify emergency resources both within and outside the State and make plans for the allocation and co-ordination of the use of those resources;
- establish and review systems for use in the control and co-ordination of emergency operations;
- review and recommend emergency management legislation including legislation and proposals for legislation of other agencies);
- advise the Minister on the creation of combined local government emergency management arrangements;
- establish communication networks within and between functional areas at all levels;
- review plans at all levels and within each emergency services organisation and functional area;
- produce specific hazard management guidelines;
- arrange emergency management training for individuals, including individuals employed in emergency services organisations and functional areas;
- produce and disseminate educational material on established emergency management policies and procedures;

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- arrange the conduct of training exercises to periodically test emergency management plans;
- advise the Minister on the declaration of states of emergencies;
- advise on the efficient use of local government resources in relation to Displan;
- assist in the selection and training of district and local government personnel for appointment to relevant organisations under Part 2 of the Act;
- act as the single point of contact for Commonwealth support to emergency operations in New South Wales in the absence of other arrangements;
- produce standing orders and instructions and standing operating procedures under Displan;
- assist the Minister, as required, in the preparation and review of Displan; and
- arrange for graduated warnings of emergencies to the public.

In addition to these responsibilities the SEMC undertakes planning for the emergency management aspects of terrorist threats and critical infrastructure.

The SEMC presently comprises the Chairperson, the State Emergency Operations Controller and nineteen (19) representatives of relevant government and non-government agencies, as determined by the Minister. The current membership and member biographies are contained in the SEMC Annual Report.

The **State Emergency Service** is an emergency and rescue service dedicated to assisting the community. It is made up almost entirely of volunteers, with 232 Units located throughout New South Wales. The Units comprise of more than 10,000 volunteer members, who are easily identified by their distinctive orange overalls.

Though major responsibilities are for flood and storm operations, the SES also provides the majority of general rescue effort in the rural parts of the state. This includes road accident rescue, vertical rescue, bush search and rescue, evidence searches (both metropolitan and rural) and other forms of specialist rescue that may be required due to local threats. The Service's trained rescuers also support the full-time emergency services during major disasters.

The SES also assists other emergency services when they are performing major operations. These services include the NSW Police Service, the NSW Rural Fire Service, the NSW Fire Brigade and the Ambulance Service of NSW.

Commonwealth

The Australian Government **Department of the Environment, Water, Heritage and the Arts** (formerly the Department of the Environment and Water Resources) develops and implements national policy, programs and legislation to protect and conserve Australia's environment and heritage. The Department, among others, deals with coasts and ocean issues.

The Department sets the scene for national cooperation in managing coastal issues and ensuring effective and complementary arrangements within and across jurisdictions, and to better reflect the interests of coastal stakeholders through the *Framework for a National Cooperative Approach to Integrated Coastal Zone Management*. The implementation of the Framework is managed through the Intergovernmental Coastal Advisory Group (ICAG), comprised of representatives from the Australian Government, each state government, the Northern Territory Government and the Australian Local Government Association (ALGA). ICAG members meet several times a year to share experiences and to work on Framework implementation.

Another program, the Coastal Catchments Initiative aims to achieve target reductions in pollutant discharges to coastal water quality hotspots. This is being done through the development and implementation of Water Quality Improvement Plans, prepared in accordance with the Australian Government's *Framework for Marine and Estuarine Water Quality Protection*.

The **Department of Climate Change and Energy Efficiency** was established on 8 March 2010 as part of the Prime Minister and Cabinet Portfolio. The Government takes the challenge of climate change seriously. The approach is to:

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- reduce greenhouse pollution in Australia in the short and long term
- work with the international community to develop a global response that is effective and fair
- prepare for the climate change that we cannot avoid.

A number of initiatives to address climate change such as National Climate Change Adaptation Framework, the National Climate Change Adaptation Programme, the Climate Change Adaptation Actions for Local Government are also relevant for coastline management.

APPENDIX B: FUNDING SOURCES

There is range of financial and technical assistance available to assist implementation of the Coastal Zone Management Plan. The following descriptions of likely sources have been provided to assist Council and the Committee with the implementation process. Potential funding opportunities continue to be developed by State and Commonwealth agencies, particularly through their environmental programs.

The Australian **Federal Government** provides a range of funding opportunities to address important natural resource issues at a local level.

Caring for our Country The Australian Government is investing \$2 billion to achieve a real and measurable difference to Australia's environment. Caring for our Country funds projects across the country to achieve national targets - projects that improve biodiversity and sustainable farm practices.

This funding supports regional natural resource management groups, local, state and territory governments, Indigenous groups, industry bodies, land managers, farmers, Landcare groups and communities. In its first five years, from July 2008 to June 2013, Caring for our Country is investing funds to improve strategic outcomes across six national priority areas:

- the National Reserve System
- biodiversity and natural icons
- coastal environments and critical aquatic habitats
- sustainable farm practices
- natural resource management in northern and remote Australia, and
- community skills, knowledge and engagement.

Under the coastal environments and critical aquatic habitats priority, the targets for funding are:

- Protecting the Reef
- Protecting Ramsar wetlands
- Protecting critical aquatic ecosystems
- Improving coastal hotspots
- Increasing coastal community engagement

Through the **Local Adaptation Pathways Program**, the Australian Government is providing funding to help councils undertake climate change risk assessments and develop action plans to prepare for the likely local impacts of climate change. The funding will help councils integrate climate change risk assessment into their broader decision-making processes. The greater level of funding available in this Round reflects higher costs for some activities in more remote regions. The process should align with that outlined in the Climate Change Impacts & Risk Management: A Guide for Business and Government.

Under Round 1 of the Local Adaptation Pathways Program, more than 60 local governments received funding for a total of 33 projects. This funding totalled \$1.5 million. The majority of these councils were located in coastal and urban areas. Under Round 2 of the Local Adaptation Pathways Program, 30 councils in regional and remote areas of Australia received \$874,000 to complement and build on the work from Round 1.

Department of Climate Change and Energy Efficiency's **Low Carbon Communities** will provide \$80 million over four years to support local councils and community organisations to cut pollution and reduce their energy costs through energy efficiency upgrades to street lighting, community facilities and council buildings. The program will also assist communities to reduce carbon pollution through investment in cogeneration facilities or energy efficient upgrades to community icons such as stadiums, education facilities, town halls and nursing homes. Low Carbon Communities will provide competitive grants to local councils and operators of community facilities via three funding streams.

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1. Small scale grants of up to \$500,000 for local councils to undertake smaller scale projects to reduce energy consumption in facilities such as outdoor lighting.
2. Large scale grants of up to \$5 million for operators of community facilities to invest in energy efficient upgrades such as the installation of cogeneration or new heating and air conditioning.
3. Greener Suburbs grants of up to \$500,000 for councils to implement capacity building and demonstration projects that improve the use of parks and green spaces in urban areas.

Program guidelines and other support material will be available shortly. The first call for applications for funding is expected to occur in mid 2011.

The **Threatened Species Network Community Grants Program** is a partnership between WWF-Australia and the Australian Government. Funding is available for on-ground activities to protect threatened species and ecological communities such as: habitat restoration, weeding and feral animal control, monitoring and surveying species populations, fencing and fire management. Funding for individual projects is limited to a maximum of \$50,000 (GST inclusive). A total of \$500,000 is available each year. For more info: www.wwf.org.au/ourwork/species/tsn

The **NSW State Government** also provides a range of funding opportunities for Councils, community organisations and individuals to address important natural resource issues at a local level.

The following funding programs are relevant to coasts & estuaries that provide funding assistance to Local Government generally on a 50% subsidy basis.

The NSW Government's **Coastal and Estuary Management Programs** are administered by the Office of Environment and Heritage (OEH) with grant funding provided by an annual allocation from NSW Treasury. Funding provided to local councils under the programs does not generally extend to matching other State Government sources of funds or funds administered by other State Government agencies. Councils are encouraged to develop partnerships with catchment management authorities (CMAs) and submit applications based on joint funding sources. Financial assistance is provided for up to 50% of the project's costs and is dependent upon State-wide priorities and availability of funding. Where a joint application is prepared with a CMA, a council or group of councils must contribute at least 25% of the project costs, with the CMA contributing up to 25% of the costs.

A review of these programs has resulted in a revised focus on funding, with a greater emphasis placed on:

- _ updating coastal hazard studies to incorporate sea-level rise benchmarks
- _ updating estuary plans to consider climate change impacts
- _ estuary health monitoring and improvement
- _ focusing on high-hazard coastal areas and stressed estuaries.

The **Floodplain Management Program** provides technical advice, data collection and funding assistance on a varying subsidy basis. Activities subsidised include studies, mitigation works and other measures that reduce the impact of flooding and flood liability on existing owners and occupiers of flood liable land (existing problems) or ensure that future development is compatible with the flood hazard (potential additional problems).

Over \$18 million in grant offers for some 258 projects was made during 2011-12 under the Coastal, Estuary and Floodplain management programs.

Opportunities under OEH Sustainability Funding Initiatives

Funding is provided or administered by OEH to support a range of sustainable practices and programs.

The NSW Government's \$700 million **Climate Change Fund** was established in July 2007 to help business, households, schools, communities and government save water, energy and greenhouse gas emissions. Current programs include:

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- \$170 million NSW Home Saver Rebates providing rebates for hot water systems, hot water circulators, rainwater tanks, dual flush toilets and washing machines
- \$30 million Public Facilities program
- \$20 million School Energy Efficiency program
- \$20 million Rainwater Tanks in Schools program
- \$150 million program under the Energy Efficiency Strategy

In addition, the Climate Change Fund provides \$2 million a year for the Central Coast Water Savings Fund

The Climate Change Fund was established under the Energy and Utilities Administration Act 1987. It incorporates the Water and Energy Savings Funds, the Climate Action Grants Program and funding from the Environmental Trust.

The City & Country Environment Restoration Program introduced a suite of new environmental initiatives in 2006. The program provides grants for projects such as urban sustainability and waste minimisation (through the Environmental Trust), as well as native vegetation assistance grants.

The Climate Action Grants Program supports projects that assist the development and adoption of technologies, processes and practices that reduce greenhouse gas emissions or help the NSW community to adapt to the impacts of climate change.

The Aboriginal Land Clean-Up Program supports partnership projects between Local Aboriginal Land Councils and local government that seek to remove illegally dumped waste from Aboriginal owned land whilst incorporating prevention, resource recovery and partnership building initiatives.

The **City & Country Environment Restoration Program** is a suite of environmental initiatives that provides \$439 million grants for projects such as urban sustainability and waste minimisation (through the Environmental Trust), in addition to grants provided for farmer exit assistance, sustainable farming and offset actions under the Native Vegetation Assistance Package. Over the next five years, the City and Country Environment Restoration Program will make \$80 million in new grants available to fund **Urban Sustainability Program** local environment programs. Projects will support stormwater harvesting and its reuse, waste recycling and avoidance, and campaigns to prevent litter and illegal dumping, as well as initiatives to restore local waterways and urban bushland. The Urban Sustainability Program will allow the Environmental Trust to continue to work in partnership with local councils, to help the people of NSW to protect and restore the environment.

The aim of the **Environmental Restoration & Rehabilitation Grants** is to improve the capacity of communities and organisations to protect, restore and enhance the environment. The grants are offered by the Environmental Trust, administered by the Department of Environment, Climate Change and Water (DECC). The Trust is offering ten competitive grant programs in 2009 up to a value of \$6.75 million. The Objectives of the Environmental Restoration and Rehabilitation Program are:

- to restore degraded environmental resources, including rare and endangered ecosystems
- to protect important ecosystems and habitats of rare and endangered flora and fauna
- to prevent or minimise future environmental damage
- to enhance the quality of specific environmental resources
- to improve the capacity of eligible organisations to protect, restore and enhance the environment
- To undertake resource recovery and waste avoidance projects and to prevent and/or reduce pollution.

Total funds being offered under the R&R program in 2009 are: \$1.5 million allocated to the Community grants program and \$1.5 million allocated to the State and Local Government grants program. Grants between \$5,000 and \$100,000 are available.

Grants are available from **Recreational Fishing (salt water) Trust Fund**, operated by I&I NSW for various groups including councils for the improvement of recreational fishing for a period of one year, up to a maximum

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of three years. Applications are sought in February each year but can also be submitted any time. Contact Recreational Fishing Trusts Executive Officer.

Each year up to \$1.35 million is distributed on a dollar-for-dollar basis under **Sharing Sydney Harbour Access Program**, a NSW government initiative operated by the Department of Planning to improve public access to and enhance the recreational enjoyment of Sydney Harbour and its tributaries for the people of and visitors to Sydney. The Sharing Sydney Harbour Access Program was launched in February 2003 to assist with implementing the Sharing Sydney Harbour Access Plan. The NSW Government has recently announced that the Program will be extended over five years to provide \$6.75 million until 2013. Grant is available for specific capital works projects such as walking tracks, cycle paths, new public waterfront parks, jetties, pontoons and boat launching facilities.

The **Better Boating Program (BBP)** is a State Government grants program aimed at providing recreational boating infrastructure for the benefit of the boating community on New South Wales waterways. The BBP, which commenced in July 2009, consolidates the three grants programs previously run by NSW Maritime.

Since the inception of infrastructure grant funding in 1998, the State Government has provided over \$25 million for around 470 boating infrastructure improvements across NSW. Under the BBP, up to \$5 million is available annually from 1 July 2009 for the next five years, across three categories:

Better Boating - Regional Infrastructure Grants

Funding allocated	Up to \$2.5 million per year
Funding ratio	Up to 50% of total eligible costs
Outcomes	Better public recreational boating infrastructure across NSW

Better Boating – Sharing Sydney Harbour Access Program (SSHAP)

Funding allocated	Up to \$0.5 million per year
Funding ratio	Up to 50% of total eligible costs
Outcomes	Improvements to water-based public access to Sydney Harbour and its tributaries for the people of and visitors to Sydney

Better Boating – Sydney Harbour Boatramps

Funding allocated	Up to \$1.5 million per year
Funding ratio	Up to 100% of total eligible costs
Outcomes	Improved public boatramp facilities in Sydney Harbour

Note: The remaining \$0.5 million each year may be distributed across the above categories subject to demand.

The **Metropolitan Greenspace Program (MGP)** has been identified in the Government's City of Cities plan for Sydney's future as a key initiative for improving links between bushland, parks, waterways and centres. In implementing the program, the Department of Planning works closely with local councils to plan and improve regionally significant greenspace, including parks, trails and reserves. In 2009, MGP delivered \$2.4 million to councils across Sydney on a dollar-for-dollar basis for 17 separate open space and regional trail projects across Sydney.

MANLY COVE COASTAL ZONE MANAGEMENT PLAN

The **Coastal Lands Protection Scheme (CLPS)** is used to bring significant coastal lands into public ownership and provides for their long term management and care. The Department of Planning administers the Scheme which receives an annual budget allocation of \$3 million for acquisitions.

The Scheme, which commenced in 1973, identified certain lands to be protected and acquired. These lands usually included features such as headlands, dunes, hinterland, coastal lagoons and lakes, particularly where the original vegetation was still dominant. More recently the Scheme has been used to acquire additional lands on an opportunistic basis, if they meet certain criteria.

The main criteria for acquisition under the Scheme are:

- Public access: to promote public access to the coastal foreshore.
- Scenic quality: to maintain the scenic quality of the NSW coast.
- Ecological values: to protect ecological sites of regional, state and/or national significance.

Since the Scheme commenced approximately 15,427 hectares at a total cost of \$70.8 million have been acquired (as at June 2009). By identifying, acquiring and reserving land we have been able to create new coastal national parks and reserves for public enjoyment.

The Department's land managers and resource specialists work together to negotiate purchases under the Scheme, arranging the transfer of land to management agencies such as the Department of Environment, Climate Change and Water (for a national park), the Land and Property Management Authority (for a Crown reserve) or under some circumstances the local council (for a public reserve).

The NSW Government in partnership with the Commonwealth Government under the Natural Disaster Resilience Program is offering the **Natural Disaster Resilience Grants Scheme (NDRGS)**. The NDRGS replaces the Natural Disaster Mitigation Programme and makes grants available to local governments and agencies to undertake a wide range of natural disaster risk assessments and risk reduction works; which contribute to safer, sustainable communities which are more resilient to the effects of natural disasters.

All three spheres of government provide funding under the Natural Disaster Mitigation Program. In the 2009 Budget the Australian Government announced funding of \$79.3 million over four years for a new Natural Disaster Resilience Program (NDRP). The Program will consolidate the existing Bushfire Mitigation Program (BMP), the Natural Disaster Mitigation Programme (NDMP) and the National Emergency Volunteer Support Fund (NEVSF).

Generally, the Australian and New South Wales Governments contribute up to one third each of approved project costs. Local agencies and in some cases private sector contributors make up the balance.

A wide range of natural disaster risk reduction works; which contribute to safer, sustainable communities which are more resilient to the effects of natural disasters, qualify for funding under the NDRGS. They may include:

- natural disaster risk management studies
- disaster mitigation strategies
- investment in disaster resilient public infrastructure
- structural works to protect against damage (e.g. disaster proofing of existing buildings at risk, levees, retarding basins and channel improvements, permanent fire breaks, other engineered works that offer protection from natural disasters)
- disaster warning systems
- community awareness and readiness measures
- audits of levees and warning systems
- research to improve knowledge of natural disaster risk and mitigation
- Geographic Information Systems (GIS) based hazard and flood data for disaster mitigation purposes
- land and building purchase schemes in high-risk areas



APPENDIX C: LIST OF THE ARCHITECTURAL AND ARCHAEOLOGICAL ITEMS IN THE MANLY COVE STUDY AREA

ITEM	ADDRESS
Listed under State Heritage Register	
Manly Cove Pavilion	West Esplanade, Manly
Manly Wharf	
Listed under s.170 NSW State Agency Heritage Register	
Manly Cove Pavilion	West Esplanade, Manly
Manly Wharf	
Listed under Sydney Regional Environmental Plan	
Manly Wharf	
Manly Rowing & Sailing Club	East Esplanade, Manly
Remains of Manly public baths	East Esplanade, Manly
Site and remains of Brightside cargo wharf	East Esplanade, Manly
Site and remains of harbour side pool and steps	East Esplanade, Manly
Site of Manly Fun Pier	Manly Wharf
Listed under Manly Local Environmental Plan (version 11 March 2011, Schedule 4)	
<i>Architectural and Archaeological Items</i>	
Manly Wharf (façade & street returns only)	The Esplanade, Manly
House	5 and 7 East Esplanade, Manly
Residential flat building	1 Addison Rd, Manly
Two terrace houses	59 -61 Addison Road, Manly
Addison Road (from Wood Street to Osborne Road)	Manly
"Trevitt House"	12 Oyama Avenue, Manly
Bus Depot	West Esplanade, Manly
Dressing Pavilion and Amenities Block	West Esplanade, Manly
Manly Fun Pier	Manly Wharf
Manly Rowing and Sailing Club group of Buildings	East Esplanade, Manly
Merriwa, Residential buildings	10 Wood Street Manly
<i>Landscape Items</i>	
Monument	East Esplanade



MANLY COVE COASTAL ZONE MANAGEMENT PLAN

ITEM	ADDRESS
Harbour Foreshores	Boundary of Municipality adjacent to the Harbour
Stone kerbs	Manly Municipal area
Park	East Esplanade
Park	West Esplanade

APPENDIX D: STATE OF THE ENVIRONMENT (MANLY COUNCIL) – MONITORING INDICATORS & DATA

Indicators	2006/07	2007/08	2008/09	2009/10	Comments
Land Clearing and Re-vegetation					
Approvals to remove trees (private land)	159	193	173	208	
Total number of local native plants supplied to volunteers, contractors and residents	10,679	13,237	8,576	7,413	
Air Quality					
Air pollution complaints received by Council	20	8	3	16	
Greenhouse Gas Emissions					
Registered vehicles in council LGA*	23,113	23,727	24,585	24,804	Data source RTA
Number of council fleet vehicles^	170	162	177	N/A	
GHG emissions from all council fleet vehicles (tonnes CO ₂ e)^	1,335	1,367	1,384	N/A	
Electricity use – council's operations (mWh)	5,698	5,441	5,427	5,562	
GHG Emissions from kilowatt hrs (tonnes CO ₂ e)	5,485	5,775	5,760	5,755	
Stormwater					
Number of gross pollutant traps (council control)	23	24*	23**	23	*Two units were not performing to full operational capacity during 2007/08. ** Four units were not performing to full operational capacity during 2008/09
Total gross pollutants removed from GPTs (tonnes)	183	158*	79**	169	
Water Consumption					
Total LGA potable water use (kilolitres)	3,776,919	3,565,403	3,774,512	3,726,619	
Total residential potable water use (kilolitres per capita)	80	76	77	76	
Total council potable water use (kilolitres)	104,967	79,185	80,350	82,213	
Biodiversity Condition					
Noxious weed notices*	48	83	40	36	
Noxious weed assessments undertaken*	0	47	80	48	
Number of registered active Bushcare volunteers	210	66	86	26	# During 2009/10, a major overhaul of Manly Council's volunteer database was conducted. Previous year's data includes inactive volunteers as well.
Bushcare program volunteer hours	583	528	598	675	
Number of active volunteer groups	16	11	12	12	
Number of native plant species recorded	449	449	449	449	

MANLY COVE COASTAL ZONE MANAGEMENT PLAN

Indicators	2006/07	2007/08	2008/09	2009/10	Comments
Number of threatened flora	10	10	10	10	
Number of threatened fauna	20	20	20	20	
Number of endangered ecological communities	2	2	2	2	
Number of endangered fauna populations	2	2	2	2	
Number of feral fauna species targeted through programs	2	2	1	1	
Population					
Residential density (persons per hectare)*	25.82	26.21	26.20	27.04	
Noise					
General noise complaints received	40	90	87	117	
Barking dog complaints received	7	67	16	30	
Waste					
Total waste to landfill including general cleanup (tonnes)	7,921	8,402	8,416	8,453	
Total waste to recycling including metal and green waste (tonnes)	7,479	7,576	6,618	7,407	
Total waste to landfill including general cleanup per capita (kg)	203	212	212	206	
Total waste to recycling including metal and green waste per capita (kg)	193	191	167	181	
Green waste diverted from landfill per capita (kg)	41	44	30	45	
General cleanup sent to landfill per capita (kg)	22	22	30	24	
Aboriginal Heritage					
Number of Aboriginal Heritage Sites	62	66	68	68	*This data includes sites within Council jurisdiction only. Previous SoE Reports (2006/07, 2007/08 and 2008/09) have also included sites managed by DECCW and the Sydney Federation Harbour Trust
Non-Aboriginal Heritage					
Total Number of Non-Aboriginal Heritage items	306	312	314	315	
Number of built items	194	199	201	202	
Number of landscape items	78	79	79	79	
Number of archaeological Items	34	34	34	34	
Heritage conservation areas	2	2	2	2	

Source: SHOROC State of the Environment Report 2009/2010, Manly Council data