

Sandon Point and McCauley's Beach

Vegetation Management Plan

Wollongong City Council 23 June 2014 Z14/214998

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SANDON POINT AND McCAULEY'S BEACH VEGETATION MANAGEMENT PLAN

1 INTRODUCTION

This 2014 Sandon Point and McCauley's Beach Vegetation Management Plan (VMP) is for same area as the Sandon Point and McCauley's Beach Plan of Management Area. This VMP addresses the management of all lawn, vegetated and coastal dune areas outlined in blue in Figure 1. The land parcels for which this Plan applies is shown in Table 1. The VMP has been developed as a result of the larger Plan of Management process. The separate Plan of Management for this area addresses its recreational and community uses in accordance with the Local Government Act 1993.

This Vegetation Management Plan is a revised version of Volume 3 the Revegetation and Restoration Plan of the Sandon Point and McCauley's Beach draft Plan of Management - exhibited for public comment from 1 December 2012 – 15 March 2013. It no longer forms part of the Sandon Point and McCauley's Beach draft Plan of Management. It is a Vegetation Management Plan which is an operational document Council uses to effect coastal dune management, protect endangered ecological communities and promote biodiversity through staff, contractors and volunteers. Council at its meeting of 23 June 2014 considered public submissions on Volume 3 of the draft Plan of Management for Sandon Point and McCauley's Beach and developed this VMP in response to the issues raised.

1.1 ABORIGINAL SIGNIFICANCE OF VEGETATION MANAGEMENT PLAN AREA

As designated in the map of the VMP area, in Figure 1, by a red outline, the majority of the VMP's area is a declared Aboriginal Place. The Sandon Point Aboriginal Place was declared by the Office of Environment and Heritage (OEH). The values of the Place were defined in a gazettal notification letter dated 14 February 2007 as follows:

"It is a place that has a history reflecting a resource rich environment where Aboriginal groups traditionally gathered for meetings, ceremonies and other activities, including camping and fishing. The whole of Sandon Point area is considered a significant meeting place, and a story site located on the Sandon Point headland was a place where two leaders of two Aboriginal groups met. Further, the McCauley's Beach midden is the surviving remnant of an extensive coastal midden, which includes an Aboriginal burial and re-burial site. The declaration of the Sandon Point Aboriginal Place acknowledges these values."

For more information about the Aboriginal community used a "resource rich environment" like the Sandon Point Aboriginal Place, the OEH 2005 publication, "Murni Dhungang Jirrar Living in the Illawarra" is informative and can be found by visiting the OEH website <u>www.environment.nsw.gov.au</u>.

The National Library of Australia catalogue listing summaries the publication by the following:

"This book is about Aboriginal people's uses of plants and animals in the Illawarra area, south of Sydney. The title means animal food (Murni), plant food (Dhungang) and fur (Jirrar) in Dharawal language ... [it] includes interviews with Aboriginal people, combined with extensive background research. It explores the spiritual and economic significance of various Illawarra environments - including marine, inter-tidal, estuarine, woodland and forest habitats - to the Aboriginal people of the Illawarra."

The presence of Aboriginal Heritage items within the VMP area along with the Sandon Point Aboriginal Place Declaration creates another legal obligation on Council and anyone who undertakes vegetation management works.



FIGURE 1: VEGETATION MANAGEMENT PLAN AREA

LAND OWNER	PARCEL DETAILS	PROPERTY ADDRESS	AREA (M ²)
Wollongong City	Lot 22 DP 7133	McCauley's Beach	
Council		Corbett Avenue	
		THIRROUL NSW 2515	1385
Wollongong City	Lot 25 DP 7133	McCauley's Beach	
Council		Corbett Avenue	
		THIRROUL NSW 2515	581.7
Wollongong City	Lot 26 DP 7133	McCauley's Beach	
Council		Corbett Avenue	
		THIRROUL NSW 2515	581.7
Wollongong City	Lot 27 DP 7133	McCauley's Beach	
Council		Corbett Avenue	
		THIRROUL NSW 2515	581.7
Wollongong City	Lot 28 DP 7133	McCauley's Beach	
Council		Corbett Avenue	
		THIRROUL NSW 2515	543.8
Wollongong City	Lot 1 DP 7813	Lot 1 Point Street	
Council		BULLI NSW 2516	613.4
Wollongong City	Lot 2 DP 7813	Lot 2 Point Street	
Council		BULLI NSW 2516	638.6
Wollongong City	Lot 3 DP 7813	Lot 3 Point Street	
		BULLI NSW 2516	632.8
Wollongong City	Lot 4 DP 7813	Lot 4 Point Street	000.0
		BULLI NSVV 2516	632.8
Wollongong City	Lot 5 DP 7813	Lot 5 Point Street	000.0
		BULLI NSVV 2516	689.2
	LOI 6 DP 7813		771 /
Wollongong City		BULLI INSV 2310	//1.4
			086 /
Wollongong City	L at 8 DP 7813	Lot & Blackall Street	300.4
Council		BULLI NSW 2516	866.3
Wollongong City	Lot 9 DP 7813	Lot 9 Blackall Street	000.0
Council		BULLI NSW 2516	853.6
Wollongong City	Lot 10 DP 7813	Lot 10 Blackall Street	
Council		BULLI NSW 2516	904.2
Wollongong City	Lot 11 DP 7813	11 Blackall Street	
Council		BULLI NSW 2516	853.6
Wollongong City	Lot 12 DP 7813	Lot 12 Blackall Street	
Council		BULLI NSW 2516	853.6
Wollongong City	Lot 13 DP 7813	Lot 13 Blackall Street	
Council		BULLI NSW 2516	853.6
Wollongong City	Lot 14 DP 7813	Lot 14 Blackall Street	
Council		BULLI NSW 2516	809.4
Wollongong City	Lot 15 DP 7813	Lot 15 Blackall Street	
Council		BULLI NSW 2516	758.8
Wollongong City	Lot 16 DP 7813	Lot 16 Blackall Street	
Council		BULLI NSW 2516	739.8
Wollongong City	Lot 17 DP 7813	Lot 17 Blackall Street	700.0
		BULLI NSW 2516	/39.8
	LOT 18 DP /813		739.8
		DULLI INSVV 2010	
	L of 10 DD 7812		720.9
Council	LULIS DE 1013	DOLLI NOVY 2010	139.0

TABLE 1: VMP Land Parcel Detail Table

LAND OWNER	PARCEL DETAILS	PROPERTY ADDRESS	AREA (M ²)
Wollongong City	Lot 103 DP 7813	Sandon Point Surf Club	
Council		Point Street	
		BULLI NSW 2516	24281.1
Wollongong City	Lot 238 DP	Lot 238 Aragan Circuit	
Council	1048602	BULLI NSW 2516	11060
Wollongong City	Lot 3 DP 588060	McCauley's Beach	
Council		Aragan Circuit	
		BULLI NSW 2516	1526
Wollongong City	Lot 4 DP 588060	McCauley's Beach	
Council		Aragan Circuit	
		BULLI NSW 2516	24700
Wollongong City	Lot 3 DP 417807	Sandon Point Beach	
Council		Beach Street	
		BULLI NSW 2516	19270
Wollongong City	Lot 102 DP 268549	Public Reserve	
Council		Hamilton Road	
		THIRROUL NSW 2515	38550
Wollongong City	Lot 1 DP 231244	Sandon Point	
Council		Point Street	
		BULLI NSW 2516	28440
NSW Government	Lot 7017 Crown ID	McCauley's Beach,	
Crown Land	1053538	Corbett Avenue	
		THIRROUL NSW 2515	1.481
	Total		166,179.381

1.2 PURPOSE OF THE VEGETATION MANAGEMENT PLAN

The purpose of this VMP is to guide vegetation management works within the Sandon Point and McCauley's Beach area as shown in the plan's accompanying maps and in accordance with this plan's management objectives and priorities.

For the purposes of this VMP, vegetation management guidance extends to areas of lawn/hard surface as well as vegetated areas because the mix of lawn area and specifically vegetated areas is important to be maintained as determined under this VMP. Areas of lawn/hard surface are to managed by Council as areas of park area that are mown on a regular basis and the other vegetated areas under this plan are to be managed by specific revegetation and restoration priorities.

The plan has been developed to easily communicate the processes, methods, and locations for vegetation management at Sandon Point and McCauley's Beach. This VMP is for Council staff, contractors and volunteers who undertake vegetation management, whether under direct Council management or under the direction of some other entity. The plan also provides guidance for future grant applications for bush restoration and rehabilitation projects.

The contents of this plan have been developed by Council by balancing its obligations as land owner with the results of community engagement on vegetation management. The presence of Endangered Ecological Communities (both naturally occurring and revegetated) within the plan area, combined with the occurrence of Aboriginal Heritage and Cultural values place significant requirements on Council to ensure that its use by the public is in compliance with applicable laws and regulations. It must be noted that some vegetation management actions within this plan cannot be undertaken without additional approvals or further environmental assessment.

Some permissible vegetation management actions will also require additional financial resources prior to implementation. Additional financial resources needed to fund activities called for in this plan are subject to future decisions of Council and the ability of partnering organisations or Council itself to obtain grant funding.

This VMP is a Council operational guide and is not required under any legal agreement or development consent condition at the time of its making. It is a management tool to voluntarily improve coastal dune management, protect endangered ecological communities and to promote biodiversity in a recreational coastal setting that will be increasingly used by the public as residential densities increase in the surrounding area over time.

1.3 OBJECTIVES OF THIS VEGETATION MANAGEMENT PLAN

- 1. To maintain the existing character of the area as a mix of Ecologically Endangered Communities (EECs) naturally regenerating alongside grassed lawns and vegetated coastal dune areas that meet the sandy beach.
- 2. To identify suitable plants, methods and locations for revegetation activities to balance EEC protection with the area's recreational coastal purpose next to a growing residential population.
- 3. To minimise shoreline erosion by vegetation management activities and defining access routes to the beach.
- 4. To provide a priority framework for undertaking vegetation works such as bush restoration and rehabilitation subject to funding availability in accordance with this VMP.
- 5. To identify under what conditions Council would consider removing or trimming vegetation, subject to obtaining legislative approvals.
- 6. To protect significant Aboriginal sites and the Sandon Point Aboriginal Place by midden protection measures such as dune revegetation and by acknowledging "the Aboriginal world view...[where] there is no separation of nature and culture, and the health of the natural environment and Aboriginal people are intimately connected. The wellbeing of Aboriginal people is therefore influenced by both the health of the environment and the degree to which they can be actively involved in caring for it".

Notes for Objective 6: The quote is taken from the introduction of an April 2006 OEH document "Aboriginal People, the Environment and Conservation" The Illawarra Local Aboriginal Land Council (ILALC) and NIRAG have undertaken grant funded vegetation management activities within the VMP area from 1999 to 2013 to achieve this objective. This VMP provides a framework for that work to continue if they are successful in obtaining future grant funding.

2 PAST AND EXISTING VEGETATION DESCRIPTIONS

2.1 PAST VEGETATION DESCRIPTION

While it is acknowledged that the majority of the native vegetation in the plan's area was cleared for past agricultural and industrial activities, an indication of the early vegetation of the area in the 1800s is provided by Captain Westmacott who lived from 1801 to 1870. He was an amateur artist and draughtsman with a military background, who was very important to the Illawarra region as a pictorial chronicler of the period 1837-47. He was the Aide de Camp of Governor Bourke for 11 years before settling in the Bulli area in 1837. From 1837 until his return to England in 1847, Westmacott was an active member of the local community in the roles of farmer, horse breeder, builder, brickmaker, land speculator, magistrate and part-owner of the first local steamship service. Figure 2 below is a copy of one of Westmacott art works titled Bulli Illawarra, which serves as a record of early settlement homesteads, early landscapes and use of the area by Aboriginal people in the 1840s. Note the similarity between the art work and a recent photograph of the vegetation at Tramway Creek.

FIGURE 2: 1840s BULLI ART WORK



2.2 DESCRIPTION OF EXISTING VEGETATION

The current vegetation community locations shown in Figure 2 are the result of many years of bush regeneration activities by community groups, the Illawarra Local Aboriginal Land Council, contractors and Council.

Figure 3 contains various vegetation communities and due to historical disturbance, mapping them was a complex task. Council collated and cross-referenced existing electronic information sources from NPWS, the Kuradji plan, and Council field observations to name and map the communities.

Some vegetation communities within the plan area are protected by legislation. When the vegetation community name is followed by "(EEC)" this denotes that the vegetation is protected as an Endangered Ecological Community under the NSW Threatened Species Conservation Act 1995 (TSC Act). Protection under the TSC Act is afforded to both remnant plants and

revegetated plants. OEH administers the TSC Act. Pruning and/or removing EEC vegetation would require assessment under the TSC Act by Council.

This plan uses the mapping units used by the NPWS in the 'Bioregional Assessment Study Part I: Native Vegetation of the Illawarra Escarpment and Coastal Plain' (2002) to represent the vegetation communities in this plan.

Information about NPWS Bioregional Assessment Mapping Units (MU):

- These NPWS mapping units do not contain all the plants that may be found within a vegetation type. This is due to the fact that vegetation profiles are described from a sample of survey sites when collating and analysing data.
- Plant species that are not found in the NPWS mapping species lists but would reasonably be expected to occur in an area have been included in revegetation lists to meet the requirements of the management zones, where practical in this plan. These have been added based on local knowledge.
- It must be noted that EECs protected by the Threatened Species Conservation (TSC) Act do vary in name from those used in the NPWS Bioregional Assessment. To reduce confusion we have labelled the communities that are EECs with (EEC) to remove the need to use both names in the body of the plan and in the map legends.
- The names given to the EECs in Schedule 1 of the TSC Act are listed under the 'Significant Flora and Fauna' section of the Plan with the Bioregional Assessment Mapping Unit (MU00) code in brackets for cross referencing.

List of Vegetation Communities within the Plan area with both the NPWS Mapping Unit Name and the EEC Name:

- **MU35** Alluvial Swamp Mahogany Forest (EEC Swamp Sclerophyll Forest);
- **MU36** Coastal Swamp Oak Forest (EEC Swamp Oak Floodplain Forest);
- **MU45** Coastal Sand Scrub (not an EEC);
- **MU46** Coastal Headland Banksia Scrub (not an EEC);
- **MU50** Beach Sands Spinifex (not an EEC);
- MU51 Coastal Headland Grassland (EEC Themeda Grassland on Seacliffs and Coastal Headlands);
- **MU53** Estuarine Alluvial Wetland (EEC Sydney Freshwater Wetlands);
- **MU54** Floodplain Wetland (EEC Floodplain Wetland);
- **Unclassified Naturally Regenerating Vegetation** (not an EEC, not enough characteristics to signify a defined vegetation community);
- **Unclassified Low Growing Vegetation** (not an EEC, not enough characteristics to signify a defined vegetation community); and
- Lawn/Hard Surface These areas are where active revegetation and restoration will not be pursued.

Along the plan area, north of Slacky's Creek, including the point or headland, to the reserve area across from the southern end of Aragan Circuit, there are four vegetation communities: Coastal Headland Banksia Scrub (MU46), Coastal Sand Scrub (MU45), Beach Sands Spinifex (MU50) and Coastal Headland Grassland (MU51). There is a small isolated stand of Coastal Swamp Oak Forest. There are also large areas of managed turf/mowed grass between the cycleway and beach areas.

The vegetation communities transition from Beach Sands Spinifex, to Coastal Sand Scrub to Coastal Headland Banksia Scrub with increasing distance from the beach. This pattern is characteristic of the vegetation communities found in many areas along the coast.

There is a revegetation area south of Sandon Point located in the area fronting the car park and starts from the Surf Club heading south. The revegetation contains the full set of vegetation communities mentioned above, if in a very compressed space. It does provide an example of the characteristic vegetation communities that would have previously occurred from the beach front to the hind dune/coastal headland in the PoM area.

The revegetation north of Sandon Point is located above the boat sheds where walkway access has been installed. This revegetation was installed containing the plants species found within the Coastal Headland Banksia Scrub vegetation type. Removal of this vegetation in this area has the potential to increase the risk of slope failure and/or speed up coastal erosion. On the eastern end of this revegetation, east of the boast sheds, is a small remnant population of Coastal Headlands Grasslands, listed as an EEC under the TSC Act. The remaining patch contains mainly Kangaroo Grass (*Themeda australis*) which is the dominant plant species of this vegetation type.

The weed prone areas north and south of the headland are mostly dominated by exotic species with limited numbers of native species present. This dominance of weeds means that there are currently few native seedlings germinating, with the exception of *Casuarina glauca* north of the boat shed revegetation. Removal of weed cover may reveal some indigenous species still contained within the soil seed bank however this is doubtful from past results. Revegetation is most likely required to re-introduce native plants to replace the weeds on site.

South of the point and east of the boat sheds contains a mixture of mowed kikuyu; exotic grasses; lantana; and exotic vines. Mowed areas are found next to the cycle path. North of the boatsheds is also a similar mixture of weeds.

In between Tramway Creek and up to the northern boundary of the plan area, there are six vegetation communities: Alluvial Swamp Mahogany Forest (EEC) (MU35), Coastal Swamp Oak Forest (EEC) (MU36), Coastal Sand Scrub (MU45), Beach Sands Spinifex (MU50), Estuarine Alluvial Wetland (EEC) (MU53), and Floodplain Wetland (MU54) (EEC) (Figure 4). There is a small patch of *Themeda australis* which has been identified to the west of the Alluvial Swamp Mahogany Forest (MU35). This does not necessarily indicate the presence of the EEC, MU51 – Coastal Headland Grassland. French (2010) indicates this species can occur within the Coastal Sand Scrub (MU45) vegetation community as a 'quite common species' along the south coast of NSW.

The vegetation within most of the McCauley's Beach is best characterised as Beach Sands Spinifex then Coastal Sand Scrub, heading landward. Behind the dune area, are vegetation communities that form a mosaic of Alluvial Floodplain and Estuarine Swamp Forest. The vegetation communities include Alluvial Swamp Mahogany Forest, Coastal Swamp Oak Forest, Estuarine Alluvial Wetland and Floodplain Wetland. This association of dunes, floodplain and estuarine communities can be found along the Illawarra coast; however the alluvial floodplain and estuarine swamps in other areas have been in filled, drained for agriculture and/or removed to accommodate urban expansion. Other vegetation along the edge of alluvial and estuarine communities are characterised by weed prone land in low lying areas. These areas are best characterised as a mixture of weed grasses, blackberry, and lantana thickets. There is also a small amount of Council Reserve fronting the beach at Thirroul at the northern extent of-the PoM area. This area is mowed and many informal tracks cut down the erosion scarp that exists between the beach and reserve area.

Revegetation works funded by community grants have been undertaken: along the dune front, hind dunes (by community groups) and in areas along the edge of Hewitts Creek (by Council). Revegetation in areas behind south McCauley's Beach as resulted in reinstalment of Coastal Sand Scrub and supplementation of Alluvial Swamp Mahogany Forest. The edges of these areas are highly disturbed and contain alluvial wetlands in low-lying depressions.

This current arrangement of vegetation communities whilst disturbed reflects the range of coastal zone estuarine and alluvial vegetation communities that are likely to have previously occurred in this location. Its preservation, in as natural state as possible, will continue to provide habitat to endangered fauna, that use the wide variety of habitats within this section of the VMP area.



FIGURE 3: CURRENT VEGETATION COMMUNITY/TYPE LOCATIONS

FIGURE 4: 2013 PHOTOGRAPH OF TRAMWAY CREEK VEGETATION



3 INFLUENCES ON THIS PLAN

The Vegetation Management Plan has been influenced by the Kuradji Vegetation Management Plan 2010 developed by the Illawarra Local Aboriginal Land Council, Southern Rivers Catchment Management Authority (SRCMA) and partially funded by Council. The Kuradji VMP incorporates a much larger land area than this plan, as it includes privately owned land. The vegetation surveys from the 2010 Kuradji VMP provide a comprehensive existing plant list and bush regeneration recommendations. The Kuradji VMP was part of an on-going community effort to protect and enhance the cultural and natural assets of the wider Sandon Point vicinity. The Kuradji VMP covers nine proposed management zones as shown in Figure 5.

FIGURE 5: MAP OF MANAGEMENT ZONES OF THE 2010 KURADJI VEGETATION MANAGEMENT PLAN



The Kuradji plan has been used to guide the following:

- the interpretation of vegetation communities including EECs;
- the local occurrence of plant species (when taken in conjunction with NPWS (OEH) 2002 mapping information); and
- to identify priorities for weed control within the Plan of Management area.

The revegetation strategies recommended within the 2010 Kuradji plan have been reviewed and, where required, modified to facilitate the competing community expectation of site usage and amenity. The Council review has resulted in more areas designated as Low Growing Vegetation under this plan. Future revegetation works will revegetate with low growing species. However, Council does have the ability to replace mature tall plants that have been vandalised.

A copy of the Kuradji plan is available for inspection at Council's Administration Building.

The 2010 Kuradji VMP also identified issues along Sandon Point and McCauley's Beach shoreline areas. These areas are currently being affected by the community using different pathways to access the beach and rock platform. Unrestricted access to the shoreline was identified as causing:

- Clearance or damage of vegetation (including mature plant and native seedling trampling);
- · Accelerated erosion in track areas;
- · Soil compaction from constant trampling;
- · Potential for introduction of soil pathogens;
- Introduction of weed seed;
- · Continuing soil disturbance which favours weed invasion, translocation of weed propagules, and
- Elevated nutrients from urination and defecation adding to potential weed invasion.

This Sandon Point and McCauley's Beach Vegetation Management Plan recognises the need for formalised access to prevent further erosion and provide opportunities for the community to access the beach and coastal foreshore areas. Within the plan area, there are many desire tracks and Council will continue to formalise key access points to the beach while closing or discouraging the use of other informal tracks. One way of closing informal tracks is by careful planting and this option will be considered by Council. To make the public's use of formalised access points easier, from time to time, subject to meeting legislative requirements, Council may removal or trim existing vegetation.

4 SANDON POINT AND MCCAULEY'S BEACH VEGETATION MANAGEMENT PRIORITIES

This VMP provides a priority framework for managing vegetation works such as bush restoration and rehabilitation. It also recommends actions ranked as **High**, **Medium** and **Low** in terms of time frames for undertaking possible future works. The following table identifies–strategies and their timeframe. Under this plan, Council and grant funding would be directed at high priorities first, then medium, then low.

TABLE 2:	VEGETATION	MANAGEMENT	(RESTORATION	AND	REVEGETATION	Work)
PRIORITIES W	ITHIN THE PLAN	N AREA EXCLUDIN	NG LAWN/HARD S	URFA	CE LOCATIONS	

Vegetation Management (Restoration and Revegetation) Priorities					
Prio	rity Strategies (H=High, M=Medium, L=Low)	Responsibility	Timeframe		
H1.	Threat abatement using weed control to protect and assist the expansion of the Coastal Headlands Grassland remnant on Sandon Point and the restoration of the EEC's: Alluvial Swamp Mahogany Forest, Coastal Swamp Oak Forest, Alluvial Estuarine Wetland and Alluvial Floodplain Wetland.	WCC State Government All community	Ongoing or within 1-2 years subject to future resources.		
H2.	Reconstruction/ rehabilitation of Beach Sands Spinifex communities in fore dunes areas/toe of erosion scarps.	WCC State Government All community	Ongoing or within 1-2 years subject to future resources.		
H3.	Undertake rabbit control program within the Sandon Point and McCauley's Beach area to support revegetation and restoration.	WCC	Ongoing or within 1-2 years subject to future resources.		
H4.	Continued weed control targeting invasive weed vines, perennials and woody weeds throughout previously revegetated areas.	WCC State Government All community	Ongoing or within 1-2 years subject to future resources.		
H5.	Provide formalised access to protect the coastline vegetation and Aboriginal burials, middens from trampling/track creation. Compliance with the Plan of Management for Sandon Point and McCauley's Beach required.	WCC State Government All community	Subject to future resources.		
M1.	Support the linking of wetland communities in low relief locations using selective weed control and assisted natural regeneration techniques.	WCC All community	Within 2 – 5 years, subject to future resources.		
M2.	Targeted control of invasive vines including Morning Glory, Blackberry and Chinese Honeysuckle throughout area.	WCC All community	Within 2-5 years, subject to future resources.		

Vegetation Management (Restoration and Revegetation) Priorities					
Priori	ity Strategies (H=High, M=Medium, L=Low)	Responsibility	Timeframe		
L.1	Revegetation of the foredune to Beach Sand Spinifex (MU50) south of Sandon Point.	WCC State Government All community	5 – 10 years, subject to funding resources.		
L2.	Rehabilitation of vegetation communities in areas dominated by exotic plants should proceed from the edge of EEC remnants working towards areas of highest disturbance. These works would benefit from formalised fencing to protect the installed works.	WCC State Government All community	5 – 10 years, subject to funding resources.		
L3.	Edge Consolidation of revegetation and EEC areas with buffer planting using grasses and shrubs (taking account of public access and setbacks from pathways and shared path sight lines).	WCC All community	5-10 years, subject to funding resources.		

5 REVEGETATION AND RESTORATION METHOD SPECIFICATIONS, EXCLUDING LAWN/HARD SURFACE LOCATIONS

- Revegetation and restoration priorities at the site follow the principles of the Illawarra Regional Biodiversity Strategy. That is, remnant vegetation (including established revegetation and natural remnants) should be the highest priorities for actions undertaken relating to restoration and on-going weed control, prior to initiating new revegetation projects.
- Medium to low priority actions should be staged dependent on inclusion in Councils scheduled works program and/or obtaining grant funding.
- When sourcing plant stock for revegetation or seed for direct seeding, seed stock should be acquired following the guidelines set out in Florabank Guideline 10 Seed Collection Ranges for Revegetation (Mortlock et al, 2000) (*i.e. Plants should be sourced from Illawarra provenance seed stock*).
- Prior to planting, seedlings/tubestock should be appropriately acclimatised to coastal conditions to reduce impacts of increased salt loads in exposed coastal locations.
- Revegetation works undertaken within the proximity of paths/cycle ways, beach access tracks and other recreation areas where access can be obstructed, must observe appropriate planting setbacks:
 - **§** Clumping plants and shrubs must be planted at centres that will not impede future access; it is directed that plants be spaced back from paths at distances that leaves approximately 0.5 m gaps between the pathway/access and natural area planting.
 - **§** This area is to be maintained as a mulching/spray edge for maintenance purposes. Revegetation using this edge arrangement would be a preferred method of maintaining the path edges behind McCauley's Beach because mowing these edges is known to introduce weed seed from other areas.
- Shared path sight lines are to be preserved in all traffic areas along the shared path to accommodate the modes of traffic using the shared path.
- Areas currently maintained by mowing will be maintained as they area.
- Revegetation activities within the Aboriginal Place and/or along the dunes will likely require modification of methods dependent upon specifications in the Sandon Point Aboriginal Place Management Plan and may be subject to obtaining consent under an Aboriginal Heritage Impact Permit or AHIP prior to activities being under taken.
- Works within the northern areas of PoM area are best focussed on targeted weed control and assisted natural revegetation in areas of the endangered communities and previous revegetation. Works should focus on maintenance weed control within the actively worked remnants. Revegetation should be confined to improving the diversity of species found within the remnant and reconstructed vegetation communities found on-site. Some buffer planting may be required to provide ecologically suitable habitat for the species that (fauna and flora) are expected or have previously been observed inhabiting the site. Large scale expansion of these areas is not to be undertaken using revegetation.

6 ELIGIBLE PLANTS FOR REVEGETATION AND RESTORATION ACTIVITIES UNDER THIS PLAN

Please refer to Appendix 1 to this plan for a list of plants by vegetation classification or community type which are eligible to be actively planted by volunteers or contractors under this plan in the relevant locations as shown in the VMP future maps which are at section 6.1.

The eligible plants listed in this plan for dune areas are consistent with Council's Dune Management Strategy for the Patrolled Swimming Areas of 17 Beaches.

Existing low growing areas of vegetation will be preserved and managed as areas supporting low growing vegetation (i.e. vegetation that grows to about one metre tall). The following vegetation communities/types are made up of primarily low growing plants and constitute a majority of the area:

- Coastal Sand Scrub (MU45);
- · Coastal Headland Banksia Scrub (MU46);
- Beach Sands Spinifex(MU50);
- Coastal Headland Grassland (EEC) (MU51);
- Estuarine Alluvial Wetland (EEC) (MU53);
- Floodplain Wetland (EEC) (MU54);
- Low Growing Vegetation; and
- Lawn/Hard Surface active revegetation and restoration will not be pursued in these areas.

The species list for revegetation in Low Growing Vegetation areas (see Appendix 1) was drawn from the vegetation description from the Bioregional Assessment Study (NPWS, 2002: 200; it also includes additional low growing species detailed within the planting list in Section 6 of the Plan). It predominately used Coastal Headlands Grassland (MU51) as the basis for the proposed vegetation assemblage used in areas requiring management of coastal erosion protection, biodiversity supplementation and site amenity preservation.

6.1 FUTURE VEGETATION MAPS

Please see Figures 6 - 12 for detailed maps identifying the relevant plant community and their location to guide future revegetation and restoration activities under this VMP.



FIGURE 6: FUTURE VEGETATION COMMUNITY/TYPE



FIGURE 7: MAP INDEX FOR FUTURE VEGETATION COMMUNITY/TYPE MAPS

FIGURE 8: FUTURE VEGETATION COMMUNITY/TYPE LOCATIONS MCCAULEY'S BEACH NORTH





FIGURE 9: FUTURE VEGETATION COMMUNITY/TYPE LOCATIONS MCCAULEY'S BEACH SOUTH







FIGURE 12: FUTURE VEGETATION COMMUNITY/TYPE LOCATIONS SANDON POINT SOUTH

7 ADDITIONAL VMP REQUIREMENTS

7.1 NATURAL REGENERATION

While planting of tall shrubs/trees is not permitted under this VMP, because they are not listed in Appendix 1, some self-regenerating large shrubs/trees will occur over time. This process is called Natural Regeneration and occurs when the wind blows seeds across an area and they take hold in the soil or when seeds are deposited by animal foraging actions or in their droppings. Self-regeneration of EEC vegetation is interpreted as a sign of a successful revegetation and restoration program by OEH.

Council will actively manage areas designated as Lawn/Hard Surface and Low Growing Vegetation in the future vegetation maps, but in other areas, particularly EECs, self-regeneration of tall shrubs/trees could occur.

7.2 PRUNING AND/OR REMOVAL OF VEGETATION

Council acknowledges that significant community resources (financial and community) have shaped the current vegetation landscape over the last decade and a half. This plan does not seek to change past efforts, only to shape future efforts by designation of future vegetation community locations and by setting limits on pruning and/or removal of existing vegetation. Specifically, depending on Council resources and the obtaining of the relevant approvals, pruning of vegetation and/or removal is permissible by Council Staff only, under this plan in the following circumstances:

- To maintain or create better sight lines for beach life guard and surf lifesaving club patrols during the swim season;
- To ensure designated formal access points to the beach are well maintained and clearly visible to the general public;
- To maintain at least 1 metre no vegetation zone along east and west edge of the shared path;
- To create or maintain a viewing area in front of park benches/tables that cannot be easily relocated to an area near formal access point;
- To maintain the areas designated as mowed lawn and as areas of Low Growing Vegetation.

7.3 LEGISLATIVE REQUIREMENTS

There are a number of legislative Acts and Regulations that are relevant to vegetation management within the VMP area. These are listed below:

- The National Parks and Wildlife Act 1974 (NPW Act);
- Native Vegetation Act 2003;
- Environment Planning and Assessment Act 1979 (EP&A Act);
- Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act);
- Threatened Species Conservation Act 1995 (TSC Act);
- NSW Noxious Weeds Act 1993 (NW Act);
- NSW Local Government Act (1993);
- Fisheries Management Act 1994;
- State Environmental Planning Policy No. 71 Coastal Protection (SEPP 71);

- State Environmental Planning Policy (Infrastructure) 2007;
- Japan and Australia Migratory Bird Agreement and China and Australia Migratory Bird Agreement (JAMBA and CAMBA) NSW;
- Wollongong Local Environment Plan 2009 and Wollongong Development Control Plan 2009; and
- Wollongong City Council Draft Coastal Zone Management Plan.

7.3.1 SIGNIFICANT FLORA AND FAUNA (TSC ACT IMPACTS ON VMP AREA)

Five EECs have been recorded within the VMP area and Council is legally required to protect any EECs which occur on its land, regardless of when the EEC community presents in a particular location under the TSC Act. The revegetation/restoration of the VMP area has to be carefully carried out. Council is also legally required to recognise revegetation works installed using grant funding from State and Federal sources and manage these accordingly. Some vegetation communities within the VMP area have been previously revegetated using community grant funding. The fringing areas of these communities are presently occupied by noxious and environmental weeds.

Removing existing plants by acts of vandalism or without obtaining the appropriate approvals could result in significant fines and/or jail time as in some areas the NSW Threatened Species Conservation Act 1995 (TSC Act), the National Parks and Wildlife Act 1974 and the Environmental Planning and Assessment Act 1979 apply. The existing plants throughout the entire plan area serve important functions, including Aboriginal Heritage protection and continuation of Aboriginal cultural practice and providing habitat for biodiversity.

The flora survey work documented within the 2010 Kuradji VMP and OEH (NPWS) GIS database layers found that the VMP area supports significant flora including some plant(s) and/or assemblages that are locally rare and others that are protected under the NSW Threatened Species Conservation Act 1995 (TSC Act).

The significant vegetation observed and described by the 2010 Kuradji VMP consultant in the VMP area included the following Endangered Ecological Communities listed under Schedule 1 of the Threatened Species Conservation Act:

- Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Bioregions (MU54);
- Sydney Coastal Estuary Swamp Forest Complex (MU53);
- Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Bioregions; (MU35);
- Swamp Oak Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Bioregions; (MU36); and
 - Themeda grassland on seacliffs and coastal headlands (MU51).

The significant flora also included the following Endangered Species listed under Schedule 1 of the Threatened Species Conservation Act:

- Syzigium paniculatum;
 - and the Vulnerable Species listed under Schedule 2 of the Threatened Species Conservation Act:
- Maundia triglochinoides.

(*Note:* Previously identified but not observed by the Cumberland Flora and Fauna Interpretive Services for 2010 Kuradji VMP).

The 2010 VMP also identifies the potential for *Typhonium eliosurum* in the VMP area based on the similarity in habitat observed in other Illawarra locations and anecdotal evidence that the species had been observed *'at the top of the Illawarra escarpment above the study area'*.

A list of regional/site significant species was also collated by Cumberland Flora and Fauna Interpretive Services. This should be reviewed prior to undertaking on-site works.

For a detailed examination of the vegetation communities, the plant species found, general locations and weed threats and strategies for control refer to the 'Sandon Point Aboriginal Place and Kuradji Lands Vegetation Management Plan' and the relevant Zone Appendix (Cumberland Flora and Fauna Interpretive Services, 2010).

The vegetation communities present also provide habitat for a diverse range of fauna species, some of which were observed on privately owned lands adjacent to the VMP area.

Threatened species that have been recorded near or on the VMP area include the following Endangered Species listed under Schedule 1 of the Threatened Species Conservation Act:

- Litoria aurea Green and Golden Bell Frog; and
- Botaurus poiciloptilus Australasian Bittern.

The significant fauna recorded also includes the Vulnerable Species listed under Schedule 2 of the Threatened Species Conservation Act:

Pteropus poliocephalus - Grey Headed Flying Fox.

Due care is to be undertaken in any areas where these species have been identified and potential harm to their identified or potential habitat. Refer to specific NSW Threatened Species Conservation Act 1995 (TSC Act) species pages for appropriate works guidelines (<u>http://www.environment.nsw.gov.au/threatenedspecies</u>). Council employees are also required to access the land mapping constraints layer to ascertain the location prior to initiating works within the VMP area.

7.3.2 COASTAL ZONE MANAGEMENT (SEPP 71 CONSIDERATIONS)

The removal of coastline vegetation assemblages within urban areas has destabilised the foreshore along the coastal fringe at many places in the plan area. Vegetation communities found between the beach strand line and park land managed areas are especially affected. These areas currently have either minimal vegetation; no space to be installed; or it is very disturbed.

Fore dune areas currently provide little capacity to capture windblown marine sands that are periodically deposited. This is leading to the creation of erosion scarps in areas located to the rear of the beaches in areas of high recreational usage. The landward recession of beach areas throughout the Sandon Point and McCauley's Beach shorelines has been identified as "high erosion and recession from sea level rise forecast for 2050 and 2100" within the Wollongong City Council Coastal Zone Study (Cardno Lawson Treloar, 2010) and Management Plan (BMT WBM, 2012) http://www.wolongongnsw.gv.au/development/coastal/capacita.com Without significant sand binding vegetation there is a high 'potential risk' of these areas being quickly eroded during storm events and for this to occur more severely with sea level rise. (Please refer to the Wollongong City Council Coastal Zone Study for more information and maps).

Initial attempts to stabilise fore dune areas will be undertaken by reconstructing or restoring the Beach Sands Spinifex or Coastal Sand Scrub vegetation type that inhabits the toe of the erosion scarps. Dune stabilisation under this PoM will occur in compliance with any adopted Council Dune Management Strategy.

Formalised access is recommended for sections of McCauley's Beach and areas with high recreational pressures to reduce informal track making and help Spinifex re-establish. The aim is to increase Spinifex cover to reduce opportunities for coastal erosion to occur.

8 APPENDICES

APPENDIX 1: ELIGIBLE PLANT LISTING FOR EACH VEGETATION CLASSIFICATION IN THE FUTURE VMP MAPS

Notes for Appendix 1:

- 1. Each Vegetation Classification is identified by the associated map colour/pattern, and name(s) and includes two plant listings.
- 2. Under the heading "Plants eligible for revegetation and restoration activities" are listed plants that staff, contractors and volunteers can plant within the designated area shown in the future maps.
- 3. Under the heading "Natural Regeneration May Occur due to existing 2012 Vegetation No Planting under this VMPx", are listed the plants that are a member of the vegetation classification or community and exists in the VMP area; but is not eligible for planting by volunteers or contractors. These plants may naturally regenerate within the area. Replacement of these highlighted existing plants may be undertaken by Council staff in cases of vandalism.
- 4. Indicates plants profiled in "Murni Dhungang Jirrar Living in the Illawarra". This book is about Aboriginal people's uses of plants and animals in the Illawarra. It is on the OEH website. It is not an exhaustive list of all plants used culturally by Aboriginal people.
- 5. Common names are in brackets following scientific names, if one is applicable.



ELIGIBLE PLANTS FOR UNCLASSIFIED LOW GROWING VEGETATION AREAS IN THE VMP FUTURE MAPS

Plants eligible for revegetation and restoration activities

Actites megalocarpa (native thistle) - plant for incipient dune; Austrofestuca littoralis (native grass); Breynia oblongifolia (Native Coffee Bush) - plant for Fore-dune and Crest; Calystegia soldanella / Calystegia sepium (Bugle vine) - plant for incipient dune; Carex appressa (a sedge plant) - plant for Hind-dune and creek mouths; *Carpobrotus glaucescens (Pig Face) - plant for incipient dune; Centella asiatica (pennywort); Commelina cyanea (Scurvy weed) - plant for Fore-dune and Crest; Convolvulus erubescens (Blushing bindweed); Correa alba (White Correa) - plant for Fore-dune and Crest; *Crinum pedunculatum (Swamp Lily) - plant for Hind-dune and creek mouths; *Dianella caerulea (Blue Flax Lily, Snake Whistle); Dichelachne crinita (Plume Grass); Dichondra repens (Kidney Weed) - plant for Fore-dune and Crest; Einadia sp. (native saltbush); Ficinia (Isolepis) nodosa (Knotted Clubrush) - plant for incipient dune; Gahnia clarkei (Clarkes Sedge) - plant for Hind-dune and creek mouths; *Geranium homeanum (Native Geranium); Helichrysum rutidolepis (Pale Everlasting); Hibbertia scandens (Climbing Guinea Flower) - plant for Fore-Dune and Crest; Juncus krausii (Salt Marsh Rush) - plant for Hind-dune and creek mouths; Leucopogon parviflorus (Coast Bearded Heath) - plant for Fore-dune and Crest; *Lomandra longifolia (Spiny Headed Mat-rush) - plant for Fore-dune and Crest; Melaleuca hypericifolia (Hillock Bush) - coastal headland form; Melanthera biflora (Coastal Melanthera) - plant for incipient dune; Microlaena stipoides (Weeping Grass); Myoporum boninense (Boobialla); Notolaea venosa (Native Olive) - plant for Hind-dune and creek mouths; Pelargonium australe (Native Storks bill) - plant for Fore-dune and Crest; Phragmites australis (Common Reed); *Pimelia linifolia* (Rice Flower);

Pittosporum revolutum (Rough Fruited Pittosporum) - plant for Hind-dune and creek mouths;

Poa labillardieri (Tussock Grass) - plant for incipient dune; Pseuderanthemum variable (Pastel Flower) - plant for Hind-dune and creek mouths; Rhagodia candolleana (Coastal Saltbush) - plant for Fore-dune and Crest; Scaevola calendulacea (Coastal Fan Flower) - plant for incipient dune; Senecio lautus ssp maritimus (Coastal Groundsel); Senecio linearifolius, Senecio sp. (Fireweed Groundsel); Spinifex sericeus (Spinifex Grass) - plant for incipient dune; Sporobolus virginicus (Salt Couch Grass) - plant for incipient dune; Tetragonia tetragonioides (Warrigal Greens) - plant for incipient dune; Themeda australis (Kangaroo Grass); Viola banksii or V. hederaceae (Native Violet); Viola betonicifolia (Native Violet); Westringia fruticosa (Coastal Rosemary) - plant for Fore-Dune and Crest; Zieria smithii (Sand Fly Zieria); and Zoysia macrantha (Prickly Couch) - plant for Hind-dune and creek mouths.



ELIGIBLE PLANTS FOR SWAMP SCLEROPHYLL FOREST EEC, ALLUVIAL SWAMP MAHOGANY, NPWS MAPPING UNIT NUMBER 35 AREAS IN THE VMP FUTURE MAPS

Plants eligible for revegetation and restoration activities

Calystegia soldanella / Calystegia sepium (bindweed) - plant for incipient dune; Carex appressa (a sedge plant) - plant for Hind-dune and creek mouths; Commelina cyanea (Scurvy Weed) - plant for Fore-dune and Crest; Gahnia clarkei (Clarkes Sedge) - plant for Hind-dune and creek mouths; *Lomandra longifolia (Spiny Headed Mat-rush) - plant for Fore-dune and Crest; Myoporum boninense (Boobialla); Notolaea venosa (Native Olive) - plant for Hind-dune and creek mouths;

Pimelia linifolia (Rice Flower);

Pittosporum revolutum (Rough Fruited Pittosporum) - plant for Hind-dune and creek mouths;

Pseuderanthemum variable (Pastel Flower) - plant for Hind-dune and creek mouths;

Rhagodia candolleana (Coastal Saltbush) - plant for Fore-dune and Crest;

Tetragonia tetragonioides (Warrigal Greens) - plant for incipient dune;

Viola banksii or V. hederaceae (Native Violet); and

Viola betonicifolia (Native Violet).

<u>Natural Regeneration May Occur due to existing 2012 Vegetation – No Planting under</u> <u>this VMP ×</u>

Alphitonia excelsa (Red Ash) - plant for Hind-dune and creek mouths;

Backhousia myrtifolia (Grey Myrtle) ×

*Casuarina glauca (Swamp Oak) - plant for Hind-dune and creek mouths ×

*Eucalyptus botryoides (Bangalay, Southern Mahogany)- plant for Hind-dune and creek mouths ${\rm \times}$

Eucalyptus longifolia (Woolybutt) \times

*Eucalyptus robusta (Swamp Mahogany) - plant for Hind-dune and creek mouths ×

Glochidion ferdinandi (Cheese Tree) - plant for Hind-dune and creek mouths ×

*Livistona australis (Cabbage Tree Palm) ×

*Melaleuca linariifolia (Soft Leafed Tea Tree, Snow in summer) ×

Melaleuca styphelioides (Prickly Paperbark) ×

Synoum glandulosum (Scented Rosewood) - plant for Hind-dune and creek mouths ×



ELIGIBLE PLANTS FOR SWAMP OAK FLOOD PLAIN FOREST EEC, COASTAL SWAMP OAK FOREST, NPWS MAPPING UNIT NUMBER 36 AREAS IN THE VMP FUTURE MAPS

Plants eligible for revegetation and restoration activities

Calystegia soldanella / Calystegia sepium (bindweed) - plant for incipient dune; Commelina cyanea (Scurvy Weed) - plant for Fore-dune and Crest; *Crinum pedunculatum (Swamp Lily, Crinum Lily) - plant for Hind-dune and creek mouths; *Dianella caerulea (Snake Whistle, Blue Flax Lily); Dichondra repens (Kidney Weed) - plant for Fore-dune and Crest; Einadia sp. (native saltbush); Ficinia (Isolepis) nodosa (Knobby Clubrush) - plant for incipient dune; Hibbertia scandens (Climbing Guinea Flower) - plant for Fore-Dune and Crest; Juncus krausii (Salt Marsh Rush) - plant for Hind-dune and creek mouths; *Lomandra longifolia (Spiny Headed Mat-rush) - plant for Fore-dune and Crest; Notolaea venosa (Native Olive) - plant for Hind-dune and creek mouths; Pittosporum revolutum (Rough Fruited Pittosporum) - plant for Hind-dune and creek mouths; Pseuderanthemum variable (Pastel Flower) - plant for Hind-dune and creek mouths; Sporobolus virginicus (Salt Couch) - plant for incipient dune; and Tetragonia tetragonioides (Warrigal Greens) - plant for incipient dune. Natural Regeneration May Occur due to existing 2012 Vegetation - No Planting under this VMP × Alphitonia excelsa (Red Ash) - plant for Hind-dune and creek mouths;

*Casuarina glauca - (Swamp Oak) - plant for Hind-dune and creek mouths ×

Melaleuca styphelioides (Prickly Paperbark) ×



ELIGIBLE PLANTS FOR COASTAL SAND SCRUB, NPWS MAPPING UNIT NUMBER 45 AREAS IN THE VMP FUTURE MAPS

Plants eligible for revegetation and restoration activities

Actites megalocarpa (native thistle) - plant for incipient dune; Breynia oblongifolia (Native Coffee Bush) - plant for Fore-dune and Crest; *Carpobrotus glaucescens (Pig Face) - plant for incipient dune; Centella asiatica (pennywort); Convolvulus erubescens (bindweed); Correa alba (White Correa) - plant for Fore-dune and Crest; Dichelachne crinita (a plume grass); Dichondra repens (Kidney Weed) - plant for Fore-dune and Crest; Einadia sp. (native saltbush); Ficinia (Isolepis) nodosa (Knobby Clubrush) - plant for incipient dune; *Geranium homeanum (Native Geranium); Hibbertia scandens (Climbing Guinea Flower) - plant for Fore-Dune and Crest; *Leptospermum laevigatum (Coast Tea Tree) - plant for Fore-dune and Crest; Leucopogon parviflorus (Coastal Beard Heath) - plant for Fore-dune and Crest; *Lomandra longifolia (Spiny Headed Mat-rush) - plant for Fore-dune and Crest; Myoporum boninense (Boobialla); Pelargonium australe (Native Storks bill) - plant for Fore-dune and Crest; Pimelia linifolia (Rice Flower); Rhagodia candolleana (Coastal Saltbush) - plant for Fore-dune and Crest; Scaevola calendulacea (Coastal Fan Flower) – plant for incipient dune; Senecio lautus ssp maritimus (Coastal Groundsel); Senecio linearifolius, Senecio sp. (Fireweed Groundsel); Themeda australis (Kangaroo Grass); Viola banksii or V. hederacea (Native Violet); Viola betonicifolia (Native Violet); Westringia fruticosa (Coastal Rosemary) - plant for Fore-Dune and Crest; and Zieria smithii (Sand Fly Zieria). Natural Regeneration May Occur due to existing 2012 Vegetation – No Planting under this VMP × *Acmena smithii (Lilli Pilli) × Alphitonia excelsa (Red Ash) - plant for Hind-dune and creek mouths; *Banksia integrifolia ssp integrifolia (Coast Banksia) - a plant for Fore-dune and Crest × Synoum glandulosum (Scented Rosewood) - plant for Hind-dune and creek mouths x



ELIGIBLE PLANTS FOR COASTAL HEADLAND BANKSIA SCRUB, NPWS MAPPING UNIT NUMBER 46 AREAS IN THE VMP FUTURE MAPS

Plants eligible for revegetation and restoration activities

Actites megalocarpa (native thistle) - plant for incipient dune; Breynia oblongifolia (Native Coffee Bush) - plant for incipient dune; Carex appressa (sedge plant) - plant for Hind-dune and creek mouths; Centella asiatica (pennywort); Commelina cyanea (Scurvy Weed) - plant for Fore-dune and Crest; Convolvulus erubescens (bindweed); Correa alba (White Correa) - plant for Fore-dune and Crest; *Crinum pedunculatum (Swamp Lily, Crinum Lily) - plant for Hind-dune and creek mouths; *Dianella caerulea (Snake Whistle, Blue Flax Lily); Dichelachne crinita (plume grass); Dichondra repens (Kidney Weed) - plant for Fore-dune and Crest; Einadia sp. (saltbush); Ficinia (Isolepis) nodosa (Knobby Clubrush) - plant for incipient dune; *Geranium homeanum (Native Geranium); Hibbertia scandens - (Climbing Guinea Flower) plant for Fore-Dune and Crest; *Leptospermum laevigatum (Coast Tea Tree) - plant for Fore-dune and Crest; Leucopogon parviflorus (Coast Bearded Heath) - plant for Fore-dune and Crest; *Lomandra longifolia (Spiny Headed Mat-rush) - plant for Fore-dune and Crest; Melaleuca hypericifolia (Hillock Bush) - coastal headland form; Melanthera biflora (Coastal Melanthera) - plant for incipient dune; Microlaena stipoides (Weeping Grass); Myoporum boninense (Boobialla); Pelargonium australe (Native Storks bill) - plant for Fore-dune and Crest; Pimelia linifolia (Rice Flower); Rhagodia candolleana (Coastal Saltbush) - plant for Fore-dune and Crest; Scaevola calendulacea (Coastal Fan Flower) - plant for incipient dune; Senecio lautus ssp maritimus (Coastal Groundsel); Senecio linearifolius, Senecio sp. (Fireweed Groundsel); Viola banksii or V. hederaceae (Native Violet); Viola betonicifolia (Native Violet); Westringia fruticosa (Coastal Rosemary) - plant for Fore-Dune and Crest;

Zieria smithii (Sand Fly Zieria);

Zoysia macrantha - plant for Hind-dune and creek mouths;

<u>Natural Regeneration May Occur due to existing 2012 Vegetation – No Planting under</u> <u>this VMP ×</u>

*Banksia integrifolia ssp integrifolia (Coast Banksia) - a plant for Fore-dune and Crest ×

*Eucalyptus botryoides (Bangalay, Southern Mahogany, Stringybark) - plant for Hind-dune and creek mouths $\pmb{\times}$

Glochidion ferdinandi (Cheese Tree) - plant for Hind-dune and creek mouths ×

Guoia semiglauca (Wild Quince) - plant for Hind-dune and creek mouths ×

*Livistona australis (Cabbage Tree Palm) ×



ELIGIBLE PLANTS FOR BEACH SANDS SPINIFEX, NPWS MAPPING UNIT NUMBER 50 AREAS IN THE VMP FUTURE MAPS

Plants eligible for revegetation and restoration activities

Actites megalocarpa (native thistle) - plant for incipient dune; Calystegia soldanella / Calystegia sepium (bindweed) - plant for incipient dune; *Carpobrotus glaucescens (Pig Face) - plant for incipient dune; Centella asiatica (pennywort); Dichelachne crinita (plume grass); Einadia sp. (saltbush); *Melanthera biflora* (Coastal Melanthera) – *plant for incipient dune;* Pimelia linifolia (Rice Flower); Pseuderanthemum variable (Pastel Flower) - plant for Hind-dune and creek mouths; Rhagodia candolleana (Coastal Saltbush) - plant for Fore-dune and Crest; Scaevola calendulacea (Coastal Fan Flower) - plant for incipient dune; Senecio linearifolius, Senecio sp. (Fireweed Groundsel); and Zoysia macrantha (Prickly Couch) - plant for Hind-dune and creek mouths. Natural Regeneration May Occur due to existing 2012 Vegetation - No Planting under this VMP × *Banksia integrifolia ssp integrifolia (Coast Banksia) - a plant for Fore-dune and Crest × Synoum glandulosum (Scented Rosewood) - plant for Hind-dune and creek mouths x



ELIGIBLE PLANTS FOR THEMEDA GRASSLAND ON SEACLIFFS EEC, COASTAL HEADLANDS EEC, COASTAL HEADLAND GRASSLAND, NPWS MAPPING UNIT NUMBER 51 IN THE VMP FUTURE MAPS

Plants eligible for revegetation and restoration activities

Breynia oblongifolia (Native Coffee Bush) - plant for Fore-dune and Crest; Calystegia soldanella / Calystegia sepium (bindweed) - plant for incipient dune; Carex appressa (sedge plant) - plant for Hind-dune and creek mouths; *Carpobrotus glaucescens (Pig Face) - plant for incipient dune; Convolvulus erubescens (bindweed); Correa alba (White Correa) - plant for Fore-dune and Crest; *Crinum pedunculatum (Swamp Lily, Crinum Lily) - plant for Hind-dune and creek mouths; Ficinia (Isolepis) nodosa (Knobby Clubrush) - plant for incipient dune; *Geranium homeanum (Native Geranium); Helichrysum rutidolepis (Pale Everlasting); Leucopogon parviflorus (Coast Bearded Heath) - plant for Fore-dune and Crest; Melaleuca hypericifolia (Hillock Bush) -coastal headland form; Melanthera biflora (Coast Melanthera) - plant for incipient dune; Poa labillardieri (Tussock Grass) - plant for incipient dune; Scaevola calendulacea (Coastal Fan Flower) - plant for incipient dune; Senecio linearifolius, Senecio sp. (Fireweed Groundsel); Themeda australis (Kangaroo Grass); and Westringia fruticosa (Coastal Rosemary) - plant for Fore-Dune and Crest.



ELIGIBLE PLANTS FOR SYDNEY FRESHWATER WETLANDS EEC, ESTUARINE ALLUVIAL WETLAND, NPWS MAPPING UNIT NUMBERS 53 AND 54 AREAS IN THE VMP FUTURE MAPS

Plants eligible for revegetation and restoration activities

Commelina cyanea (Scurvy Weed) - plant for Fore-dune and Crest; *Crinum pedunculatum (Swamp Lily, Crinum Lily) - plant for Hind-dune and creek mouths; Ficinia (Isolepis) nodosa (Knobby Clubrush) - plant for incipient dune; Juncus krausii (Salt Marsh Rush) - plant for Hind-dune and creek mouths; Phragmites australis (Common Reed); and Tetragonia tetragonioides (Warrigal Greens) - plant for incipient dune. <u>Natural Regeneration May Occur due to existing 2012 Vegetation – No Planting under</u> <u>this VMP ×</u> *Casuarina glauca - (Swamp Oak) - plant for Hind-dune and creek mouths ×

Melaleuca styphelioides (Prickly Paperbark) ×

APPENDIX 2: PROPOSED VEGETATION PROFILE FOR A LOW GROWING VEGETATION AREA UNDER THIS VMP

