

Bellambi Beach Dune Vegetation Site Plan 2018

August 2018

REVISION HISTORY

<u>VERSION</u>	DATE	COMMENTS	REVISED BY
0.1	February 2015		Aimee Beardsmore
0.2	August 2016	New vegetation mapping and revised actions	Elli Kircher
0.3	June 2017	Revised actions	Martine Fraser
0.4	August 2018	Updated due to adoption of Tree and Vegetation Vandalism Policy	Martine Fraser

Introduction

Council adopted a Wollongong Dune Management Strategy for the Patrolled Swimming Areas of 17 Beaches in March 2014. Management options were identified to address safety and recreational amenity issues, whilst also considering ecological values and the role of dunes in protection against coastal hazards.

Options relating to vegetation management are management of noxious and invasive weed species and management of subspecies of *Acacia longifolia* (Coastal Wattle).

This site plan will guide vegetation management works which will be undertaken by a number of parties including Council's dune crew and contractors, and Dunecare volunteers.

Vegetation Maps

Vegetation mapping at Bellambi Beach was initially undertaken on 9 March 2015 to inform works and provide a baseline to monitor progress. The site was divided into Bays as delineated by access paths. Each Bay was divided into patches to indicate the location and abundance of weeds and native plants.

Vegetation mapping was re-done in 8 and 21 July 2016 to update the vegetation maps and site plans to guide works, given the large amount of works already completed.

Management Actions and Priorities

Actions have been prioritised taking into consideration the following factors:

1. The overall aim to improve sight lines for lifeguards and lifesavers, recreational amenity and site access.
2. Safety of those working on the site. For example, potential for cuts from old wire and broken glass and eye injury from sticks and branches.
3. Suitability of actions to be undertaken by different parties. For example, some activities such as spraying and using mechanical equipment cannot be undertaken by Dunecare participants.
4. Severity and type of weed infestation. For example several Weeds of National Significance (WoNS) are present in the dunes. These include *Chrysanthemoides monilifera* subsp. *rotundata* (Bitou Bush), *Lantana camara* (Lantana), *Asparagus asparagoides* (Bridal Creeper), *Asparagus aethiopicus* (Asparagus Fern), *Senecio madagascariensis* (Fireweed), *Anredera cordifolia* (Madeira Vine) and *Opuntia* species (Prickly Pear).
5. Resources available.
6. Need to minimise weed reinfestation.

General Planting Guidelines

Tube stock should be planted into bare areas at a density of one plant per square metre or one or two per square metre for grasses (NSW DLWC 2001). Planting will only occur in areas where weeds or dead vegetation are removed, or where vegetation vandalism has occurred, in accordance with the Tree and vegetation Vandalism Policy.

Species to be planted should be selected from Council's adopted dune planting list as shown below (GHD 2014). The site has been divided into three management zones to aid selection of species for planting. Location of zones shown on the maps is indicative only.

Zone 1 – no planting

Zone 2 – species from incipient dune list can be planted

Zone 3 – species from fore-dune/crest and incipient dune lists can be planted

Note along the creek mouth in Bay B - Zone 2, grasses can also be selected from the creek mouth list.

Where planting is to replace tree or vegetation that was subject to vandalism, Council will respond in accordance with the Tree and Vegetation Vandalism Policy, adopted by Council on 23 July 2018. This may result in species selection that varies from these guidelines.

Plant species list for dune planting – Appendix I Dune Management Strategy (GHD 2014)

For the patrolled beach management zones, Council will consider sight line requirements when selecting suitable species for planting. Note that several patrolled beaches do not have a hind dune, and in some patrolled beach management areas, tall-growing variants of subspecies of *Acacia longifolia* have created sight line problems for lifeguard/lifesavers and can exist as a monoculture.

Incipient dune

Scientific Name	Common Name
<i>Actites megalocarpus</i>	Coastal Sowthistle
<i>Calystegia soldanella</i>	
<i>Canavalia rosea</i>	Beach Bean
<i>Carex pumila</i>	Strand Sedge
<i>Carpobrotus glaucescens</i>	Pigface
<i>Cynodon dactylon</i>	Couch
<i>Dianella congesta</i>	Coastal Flax Lily
<i>Ficinia nodosa</i>	Clubrush
<i>Melanthera biflora</i>	
<i>Poa billardierei</i>	Coastal Fescue

Scientific Name	Common Name
<i>Scaevola calendulacea</i>	Scented Fanflower
<i>Senecio spathulatus</i>	
<i>Spinifex sericeus</i>	Spinifex
<i>Sporobolus virginicus</i>	Sand Couch
<i>Tetragonia tetragonioides</i>	Warrigal Greens, Warrigal Spinach

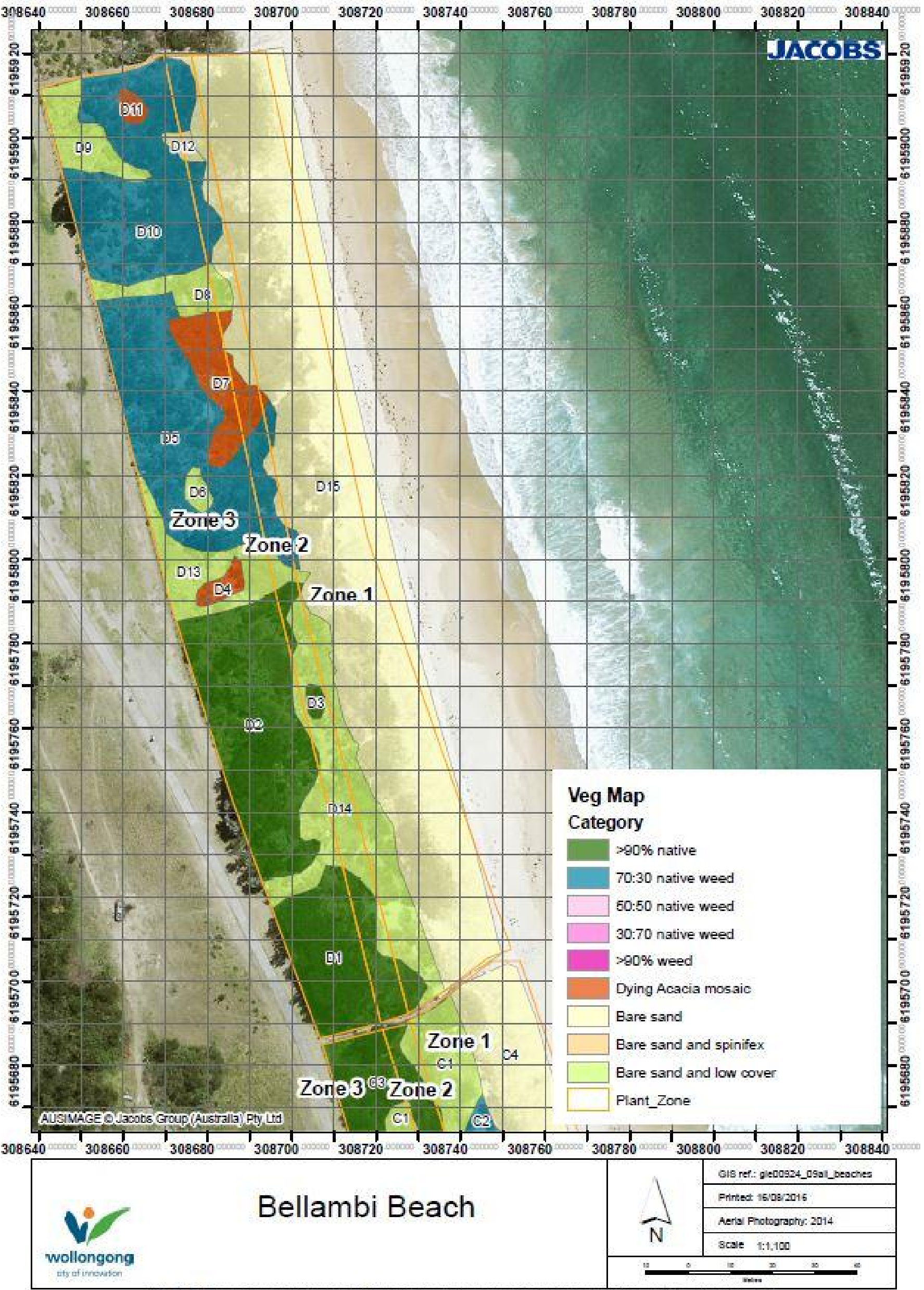
Fore-dune and Crest

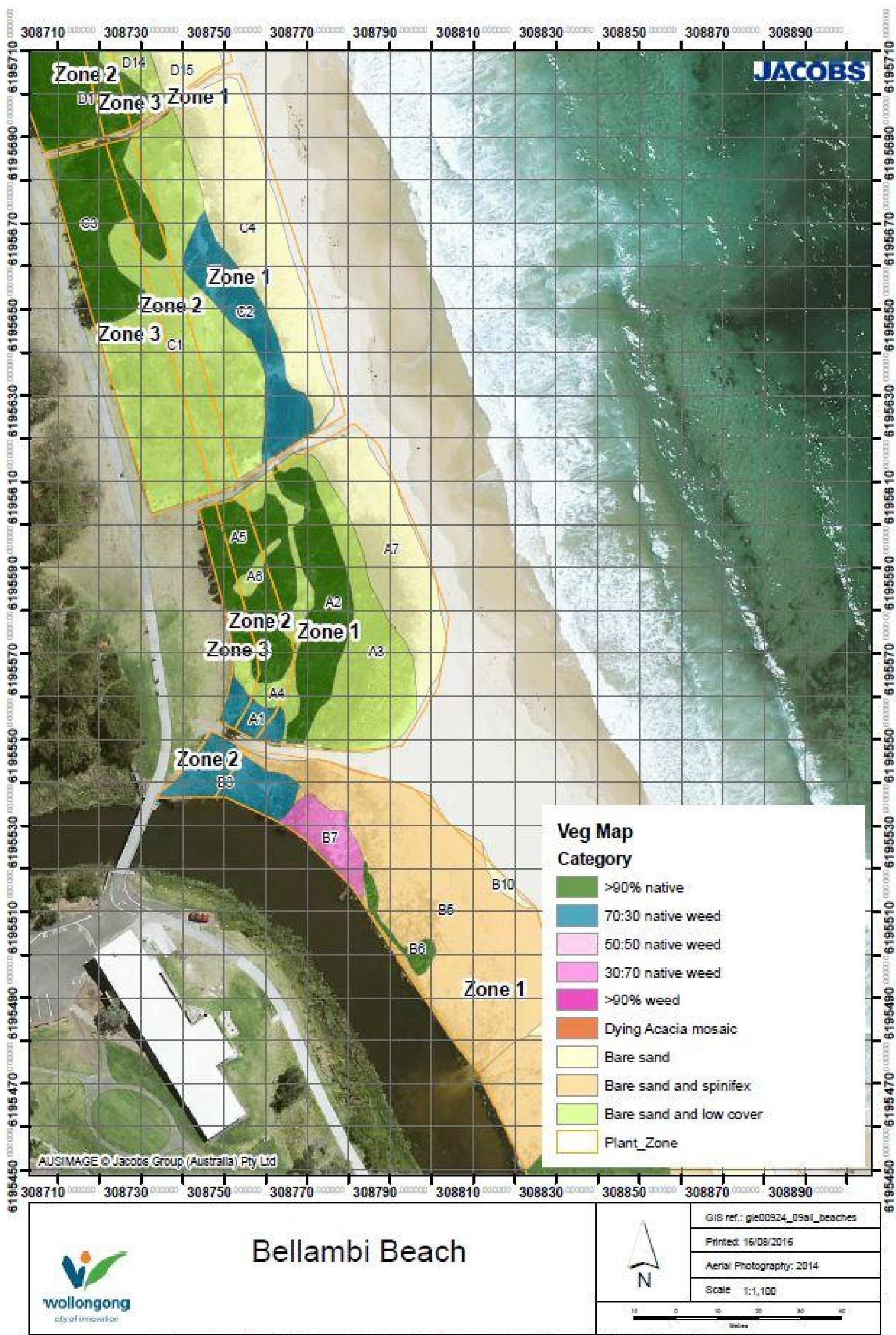
Scientific Name	Common Name
<i>Atriplex australasica</i>	Saltbush
<i>Breynia oblongifolia</i>	Coffee Bush
<i>Cayratia clematidea</i>	Slender Grape
<i>Commelina cyanea</i>	Scurvy Weed
<i>Correa alba</i> var. <i>alba</i>	White Correa
<i>Dichondra repens</i>	Kidney Weed
<i>Hibbertia scandens</i>	Golden Guinea Flower
<i>Imperata cylindrica</i> var. <i>major</i>	Blady Grass
<i>Leucopogon parviflorus</i>	White-beard
<i>Lomandra longifolia</i>	Mat Rush
<i>Monotoca elliptica</i>	Tree Broom-heath
<i>Monotoca scoparia</i>	
<i>Myoporum boninense</i> subsp. <i>australe</i>	Boobialla
<i>Pelargonium australe</i>	Coastal Geranium
<i>Rhagodia candolleana</i> subsp. <i>candolleana</i>	Seaberry Saltbush
<i>Westringia fruticosa</i>	Coastal Rosemary

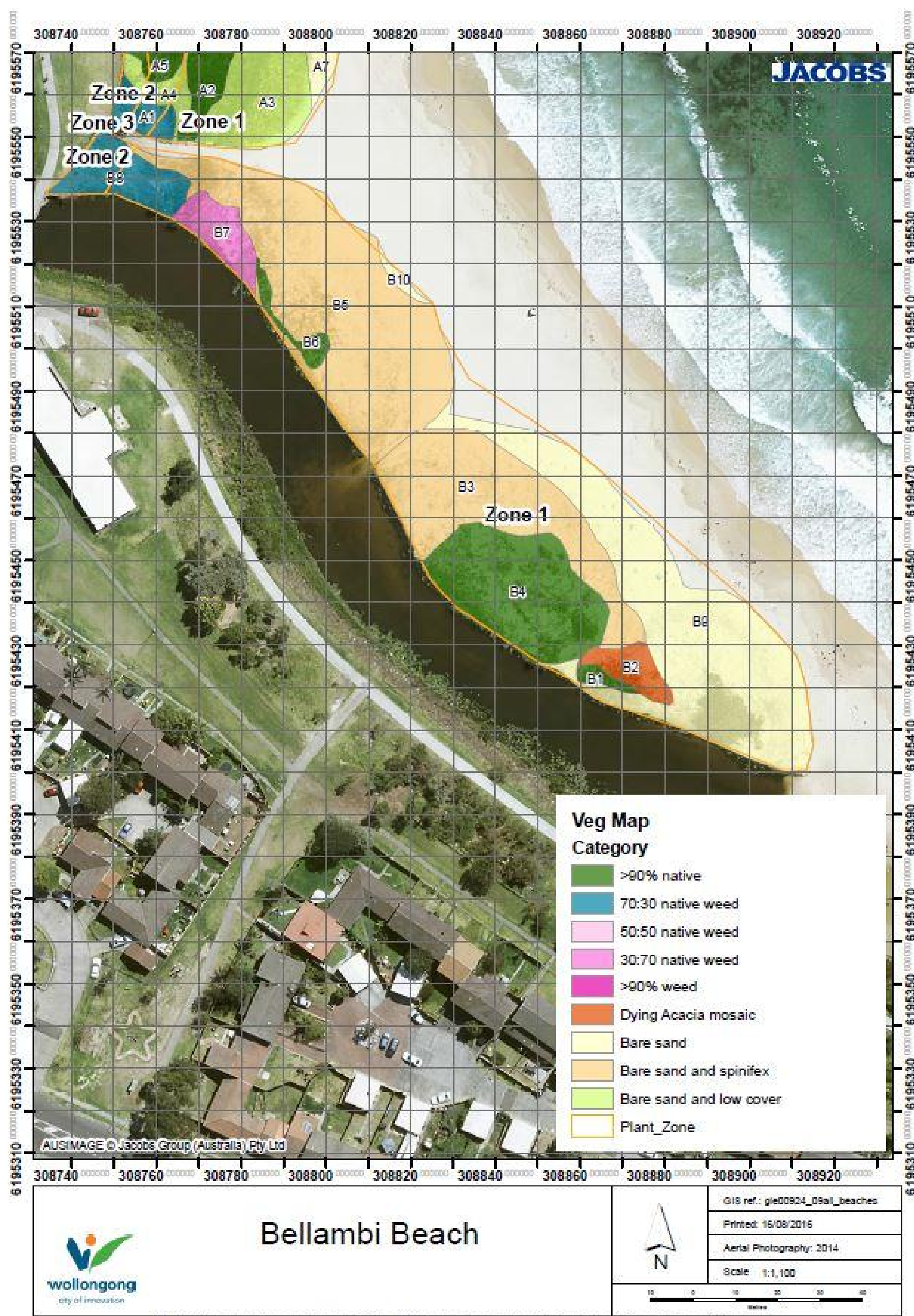
Hind-dune and creek mouths

Scientific Name	Common Name
<i>Acronychia oblongifolia</i>	White Aspen
<i>Acronychia wilcoxiana</i>	Silver Aspen
<i>Alphitonia excelsa</i>	Red Ash
<i>Banksia integrifolia</i> subsp. <i>integrifolia</i>	Coastal Banksia
<i>Carex appressa</i>	
<i>Casuarina glauca</i>	Swamp Oak
<i>Celtis paniculata</i>	Native Celtis
<i>Clerodendrum tomentosum</i>	Hairy Clerodendrum

Scientific Name	Common Name
<i>Corymbia gummifera</i>	Red Bloodwood
<i>Crinum pedunculatum</i>	Swamp- Lily
<i>Desmodium brachypodum</i>	
<i>Dodonaea triquetra</i>	Hop Bush
<i>Duboisia myoporoides</i>	Poison Corkwood
<i>Endiandra sieberi</i>	Corkwood
<i>Eucalyptus botryoides</i>	Bangalay
<i>Eucalyptus pilularis</i>	Blackbutt
<i>Eucalyptus robusta</i>	Swamp Mahogany
<i>Eustrephus latifolius</i>	Wombat Berry
<i>Gahnia clarkei</i>	Saw-sedge
<i>Gahnia melanocarpa</i>	Saw-sedge
<i>Geitonoplesium cymosum</i>	Scrambling Lily
<i>Glochidion ferdinandi</i> var. <i>ferdinandi</i>	Smooth Cheese tree
<i>Glochidion ferdinandi</i> var. <i>pubens</i>	Hairy Cheese Tree
<i>Guioa semiglauc</i>	
<i>Hardenbergia violacea</i>	False Sarsparilla
<i>Homalanthus populifolius</i>	Bleeding Heart
<i>Juncus kraussii</i> subsp. <i>australiensis</i>	Sea Rush
<i>Kennedia rubicunda</i>	Running Postman
<i>Leptospermum laevigatum</i>	Coastal Tea-tree
<i>Melaleuca linariifolia</i>	Snow in Summer
<i>Myrsine variabilis</i>	Muttonwood
<i>Notelaea venosa</i>	Native Olive
<i>Oplismenus imbecillis</i>	Basket Grass
<i>Pandorea pandorana</i> subsp. <i>pandorana</i>	Wonga Wonga Vine
<i>Pittosporum revolutum</i>	Rough-fruit Pittosporum
<i>Planchonella (Pouteria) australis</i>	Black Apple
<i>Poa poiformis</i>	Coastal Tussock
<i>Pseuderanthemum variabile</i>	Pastel Flower
<i>Synoum glandulosum</i> subsp. <i>glandulosum</i>	Bastard Rosewood
<i>Zoysia macrantha</i>	Coastal Couch







Dune Vegetation Management Actions and Priorities

Information for mapping collected on the **8 and 21 of July 2016**; and updates to actions were undertaken annually on **8 August 2016, 19 June 2017 and 6 August 2018**.

Priorities are Immediate (I), High (H), Medium (M) and Low (L). Timeframes - Immediate to start within <3 months, High 3-6 months, Medium 6-12 months, Low 12-18 months, subject to availability of resources.

Action statuses are either Ongoing, New, Complete or TBA (to be advised): Ongoing actions are actions stated in the previous dune management plan that remain relevant; New actions are newly arisen since the previous plan creation and currently relevant; Complete actions are completed since the previous plan, but may become relevant again in the future. TBA actions are relevant pending future decisions (e.g. due to threat of vandalism to plants) and funding availability.

Bay A Status	Actions	Priority (I,H,M,L)	Patches within bay															
			1	2	3	4	5	6	7									
Ongoing	Crush/ remove from site, dead and senescent <i>Acacia longifolia</i> subsp. <i>sophorae</i>	H				X												
Ongoing	Removal of remaining approx. 10m <i>Acacia longifolia</i> from Zone 1	H		X														
Ongoing	Treatment of <i>Lantana camara</i>	I						X										
TBA	Installation of low growing plant species in bare areas in Zones 2 and 3	L				X		X										
Ongoing	Treatment of <i>Acetosa sagittata</i> Turkey Rhubarb	I		X		X		X										
Ongoing	Removal of <i>Trachyandra divaricata</i> Onion Weed	H		X														
Complete	Removal of <i>Dysphania ambrosioides</i> Wormseed																	
Complete	Under pruning of <i>Banksia integrifolia</i> and <i>Acacia longifolia</i> subsp. <i>sophorae</i>																	
Complete	Removal of approx. 20m <i>Acacia longifolia</i> at the seaward side of Zone 1																	
Complete	Removal of mature <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush																	
Complete	Removal of <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush seedlings																	
Complete	Treatment of <i>Asparagus asparagoides</i>																	
Complete	Removal of <i>Opuntia</i> spp. Prickly Pear																	
Bay B Status	Actions	Priority	1	2	3	4	5	6	7	8								
Ongoing	Remove from site, dead <i>Acacia longifolia</i> subsp. <i>sophorae</i>	H		X														
Ongoing	Prevent further expansion of patches of <i>Acacia longifolia</i> subsp. <i>sophorae</i> . Trim the height to ensure sight lines are maintained.	I				X												
TBA	Installation of low growing plant species in bare areas at the rear of the dunes in Zone 2 (species other than <i>Lomandra longifolia</i>)	L								X								
Ongoing	Removal of mature <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush	I				X												
Ongoing	Removal of <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush seedlings	I				X												
Ongoing	Treatment of <i>Delairea odorata</i> Cape Ivy	I								X								
Ongoing	Move piles of dead <i>Acacia</i> away from the path	I																
Ongoing	Treatment of <i>Senecio madagascariensis</i> Fireweed	H				X		X		X								
Ongoing	Treatment of <i>Parietaria Judaica</i> Asthma weed	H								X								
Complete	Transplant previously planted <i>Lomandra longifolia</i> and <i>Imperata cylindrica</i>	L																

Complete	Removal of native tall growing seedlings in sight line from patrol room to swimming zone – mainly <i>Casuarina glauca</i> and <i>Leptospermum laevigatum</i> Teatree	L															
Complete	Removal of <i>Phragmites australis</i> in sight line from patrol room to swimming zone																
Complete	Treatment of <i>Lantana camara</i>	L															
Complete	Treatment of <i>Erythrina crista-galli</i> Cockspur Coral seedlings	L															
Complete	Treatment of <i>Acetosa sagittata</i> Turkey Rhubarb	L															
Complete	Treatment of <i>Asparagus aethiopicus</i> Asparagus Fern	L															
Complete	Treatment of <i>Stenotaphrum secundatum</i> Buffalo Grass	L															
Complete	Removal of <i>Chenopodium album</i> Fat Hen	L															
Complete	Removal of <i>Ricinus communis</i> Caster Oil Plant	L															
Complete	Removal of <i>Atriplex prostrata</i>	L															
Complete	Removal of <i>Dietes</i> spp. Iris	L															
Bay C Status	Actions	Priority	1	2	3	4											
Ongoing	Removal of <i>Acacia longifolia</i> subsp. <i>sophorae</i> from seaward 15m of Zone 1	H		X													
Ongoing	Removal of dead <i>Banksia integrifolia</i>	H			X												
TBA	Installation of low growing plant species in bare areas at the rear of the dunes in Zones 2 and 3	L	X														
Ongoing	Treatment of <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush seedlings	I	X	X	X												
Ongoing	Treatment of <i>Acetosa sagittata</i> Turkey Rhubarb	I	X	X	X												
Ongoing	Treatment of <i>Delairea odorata</i> Cape Ivy	I	X	X													
Ongoing	Treatment of <i>Asparagus aethiopicus</i> Asparagus Fern	I	X														
Ongoing	Treatment of <i>Asparagus asparagoides</i> Bridal Creeper	I	X														
Ongoing	Removal of <i>Trachyandra divaricata</i> Onion Weed	I	X														
Ongoing	Removal of <i>Opuntia</i> sp. Prickly Pear	I	X	X													
Ongoing	Treatment of resprouting <i>Lantana camara</i> or seedlings	I	X	X	X												
Ongoing	Treatment of <i>Senecio madagascariensis</i> Fireweed	I	X	X													
Complete	Removal of <i>Acacia saligna</i>																
Complete	Removal of dead vegetation																
Complete	Removal of mature <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush																
Complete	Treatment of mature <i>Lantana camara</i>																
Complete	Treatment of <i>Araujia sericifera</i> Moth Vine	L															
Complete	Removal of <i>Atriplex prostrata</i>	L															
Complete	Removal of <i>Rubus</i> spp. Blackberry	L															
Complete	Treatment of weed grasses eg. <i>Digitaria ciliaris</i> and <i>Setaria parviflora</i>	L															
Bay D Status	Actions	Priority	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ongoing	Crushing down of dead vegetation including <i>Lantana camara</i> and <i>Acacia longifolia</i> ssp. <i>sophorae</i>	H				X			X	X	X	X	X				

Ongoing	Treatment of <i>Chrysanthemoides monilifera</i> ssp. <i>rotundata</i> Bitou Bush	I		X			X	X	X	X	X		X		X		
Ongoing	Treatment of <i>Lantana camara</i>	I		X	X		X	X	X	X		X	X		X	X	
Ongoing	Treatment of <i>Acetosa sagittata</i> Turkey Rhubarb	H		X	X	X	X			X		X	X		X	X	
Ongoing	Treatment of <i>Delairea odorata</i> Cape Ivy	H					X								X	X	
Ongoing	Treatment of <i>Asparagus asparagoides</i> Bridal Creeper	H		X		X		X				X			X	X	
Ongoing	Treatment of <i>Senna pendula</i> Cassia	H									X						
Ongoing	Treatment of <i>Solanum seaforthianum</i> Brazilian Nightshade	H						X			X	X					
Ongoing	Treatment of <i>Trachyandra divaricata</i> Coastal Onion Weed	H														X	
Ongoing	Treatment of <i>Opuntia</i> sp. Prickly Pear	H		X												X	
TBA	Installation of appropriate native plant species in bare areas and following weed removal in zones 2 and 3	L						X		X	X			X	X	X	

General actions across the whole site

Status	Actions	Priority (I, H, M, L)
Ongoing	Litter removal	I
Ongoing	Removal of annual weeds, eg. <i>Bidens pilosa</i> , <i>Conyza</i> sp., <i>Sonchus</i> sp., <i>Solanum</i> sp., <i>Hypochaeris radicata</i>	I
Ongoing	Removal of <i>Ammophila arenaria</i> Marram Grass	L
Ongoing	Treatment of weed grasses eg. <i>Ehrharta erecta</i> , <i>Pennisetum clandestinum</i> , <i>Stenotaphrum secundatum</i> , <i>Sporobolus africanus</i> around native plants	H
Ongoing	Management of regenerating taller growing native plants	L
Complete	Removal of old fence wire	

References

GHD (2014) Wollongong Dune Management Strategy for the Patrolled Swimming Areas of 17 Beaches. Adopted by Wollongong City Council March 2014.

NSW Department of Land and Water Conservation (2001), Coastal Dune Management: A Manual of Coastal Dune Management and Rehabilitation Techniques, Coastal Unit, DLWC, Newcastle