Ettalong Beach Dune Management Plan

Ettalong Foreshore

June 07

Andrews.Neil

GOSFORD CITY COUNCIL
CENTRAL COAST

Andrews.Neil

ARCHITECTURE • PLANNING • LANDSCAPE • ENVIRONMENT • URBAN DESIGN

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Quality Control Plan

ISSUE	DATE	DESCRIPTION	CHECKED BY
A	27.01.06	First Draft	AC
B	06.02.06	Amendments made after feedback	AC
C	05.06.07	Amendments as per email 05.06.07	MW
D			
E			
F			

Comments

(*Use this area to write or type all changes etc required*)

Please initial page to proceed with above changes or for approval with no additions.

Signature/s: Dated:

contents

1.0 Introduction

This Dune Management Plan has been prepared to assist with the implementation of stage one of recommendations in the Ettalong Beach Reserve Plan of Management (EBRPOM). Dune vegetation and a build up of wind-blown sands in the Ettalong Town Beach Precinct has become dominant features and influences on beach amenity. The current vegetation community in this locality was established as part of a beach nourishment and stabilisation program undertaken in the mid 1980's. The plantings and sand movements were to be managed to maintain beach amenity. The vegetation community has since matured to a point where it now represents the most established vegetation community within EBRPOM study area; however the required dune and vegetation maintenance has not been carried out and now requires attention.

2.0 Objectives

To implement identified measures to improve the visual and recreational amenity of the Ettalong Town Beach Precinct in accordance with the recommendations of the Ettalong Beach Reserve Plan of Management.

The objectives of the Plan may be achieved through implementation of the following actions:

- To remove exotic weed species, particularly *Chrysanthemoides monilifera* (Bitou Bush), *Asparagus plumosus* (Asparagus Fern) and *Lantana camara* (Lantana).
- To improve the recreation value of the beach area
- To remove the *Acacia sophorae* (Coastal Wattle) back to the seaward fenceline indicated on the diagram in Appendix 1 of the Dune Management Plan.
- To selectively remove dead or dying shrub species, particularly *Leptospermum laevigatum* (Coastal Tea tree) and *Melaleuca armillaris* (Honey Myrtle).
- To selectively remove pockets of the above mentioned Coastal Tea Tree and Honey Myrtle to provide better visual surveillance of the beach and selected viewsheds of Brisbane Water/Broken Bay from The Esplanade.
- To plant the tree species of *Banksia integrifolia* (Coastal Banksia), *Eucalyptus botryoides* (Bangalay), *Cupaniopsis anacardioides* (Tuckeroo) along the highest part of the dune
- To reshape the dune in the area bounded by the most northern beach access and the amenity building so that there is a gentle grade from The Esplanade down to the beach.
- To construct up to three timber and steel viewing platforms
- To construct a new beach protective fence.
- To rationalise the number of beach access points.

[see Appendix for Scope of Works]

3.0 The Study Area

Ettalong Beach and its dune is bounded by The Esplanade along its northern edge, and extends from just south of Beach St north to Picnic Pde. It lies on the northern shore of Broken Bay and at the mouth of Brisbane Water. Immediately to the north-west of The Esplanade is the township of Ettalong Beach.

The study area is dominated by two main physical features. A brick amenity building on the corner of Picnic Pde and The Esplanade dominates the northern section of the study area, as viewed from The Esplanade. The Outrigger Resort is seen from all sections of the study area.

The densely-vegetated sand dune immediately behind the beach is the most visually dominant feature of the study area. Dominating the viewshed from both the beach, The Esplanade and other sections of the Ettalong Beach Reserve.

Source: UBD Australian Cities 2004

Ettalong Beach looking north east

3.0 The Study Area

3.1 Soil

The soil type is classified as Woy Woy Type sands overlying Narrabeen Type sands. Low fertility and highly erosive.

3.2 Vegetation

Despite being a cultural, i.e., non-natural vegetation system, the species that exist there would be endemic species to littoral sand dunes on the Central Coast.

Trees (tertiary or upper storey):

Angophora floribunda (Rough-barked Apple)

Banksia integrifolia (Coastal Banksia)

Cupaniopsis anacardioides (Tuckeroo)

Shrubs (secondary or middle storey):

Acacia sophorae (Coastal Wattle)

Acacia longifolia (Sydney Golden Wattle)

Leptospermum laevigatum (Coastal Tea Tree)

Melaleuca armillaris (Honey Myrtle)

Groundcovers (primary or lower storey):

Carpobrotus glaucescens (Pigs Face)

Lomandra longifolia (Mattrush Grass)

Pelargonium australe (Wild Geranium)

Spinifex sericeus (Spinifex)

Existing Vegetation

4.0 Government Policies

The following State and Local Government policies are applicable to the study area. They are referred to in the Part 5 Assessment (REF):

SEPP 71 “Coastal Protection”

GCC “ Brisbane Water Estuary Management Plan”

GCC “Brisbane Water Flood Study”

5.0 Dune Management Issues

5.1 Erosion

The natural processes of erosion and accretion are ever-present characteristics of the study area. The study area is a small part of the greater Brisbane Water estuary whose sand movements are always in motion. Factors effecting these sand movements include: storm activity; the presence of bars at the mouth of Brisbane Water; development in and around the catchment area; presence of stormwater outlets and beach nourishment programs.

An important feature of the study area is the presence of the 50 year hazard zone (which extends to the landward side of The Esplanade). Consequently, there is always going to be a threat of erosion.

Vegetation is one of the best means of slowing the effects of erosion and the movement of wind-blown sand. The current dune is substantially vegetated, thus providing a good degree of stability from erosion pressures. Vegetation cover is less likely to offer significant protection from a major storm given the erodible tendencies of the local soil structure.

5.2 Visual amenity and surveillance

Due to the density of the vegetation on the dune (a result of a lack of maintenance), there exists a poor landscape character and capacity for visual surveillance. There are limited views of the beach from The Esplanade through the existing beach accesses. The same scenario exists looking toward The Esplanade from the beach.

Minimal beach views from The Esplanade at present

The built form is dominated by the multistorey Outrigger Resort, with the remaining buildings along The Esplanade being of maximum two storeys in height and destined for redevelopment. The brick amenity building at the corner of The Esplanade and Picnic Pde visually dominates the northern end of the study area.

5.3 Beach amenity

Ettalong Beach has a greatly diminished amenity due toa number of factors:

- the vegetation (predominantly *Acacia sophorae*) has been allowed to spread unchecked in places to within 2 metres of the high tide mark, thus reducing the usable/recreational amenity of the beach.
- the beach berm and lower slope of the dune is considerably uneven.
- the beach fences have been poorly maintained

View looking south west showing poor beach amenity

6.0 Dune Management Works

The following dune management components are proposed to be undertaken in a staged (3-5 year) time period. It is important to note that while the planning and implementation are important stages in the process, ongoing maintenance and monitoring is equally as important to the overall success of the project. Consequently, Council has to allocate funds for not only the capital works but also the ongoing maintenance and monitoring of the site.

6.1 Removal and control of weed species

The removal of weed species is to be an ongoing process. This is to be undertaken by a suitably qualified bush regeneration contractor. The bush regenerator is to be registered with the Australian Association of Bush Regenerators (AABR). The works would be under the supervision of council's bush care and weeds officers. Some chemicals/herbicides may be required, which would have to be approved by council's weeds officer.

The main weed species present on site requiring removal include:

- *Chrysanthemoides monilifera* (Bitou Bush)
- *Lantana camara* (Lantana)
- *Asparagus plumosus* (Climbing Asparagus Fern)
- *Pennisetum clandestinum* (Kikuyu)

The main ongoing weed control method to be used is the Bradley Method (Buchanan 1989). This method is to be supplemented with a replanting regime however, because of the limited capacity of this environment to naturally regenerate. Despite being labour-intensive, the Bradley Method is a suitable technique as limited ongoing disturbance of the dune vegetation is preferred. The removal of weed species wll also enhance the capacity of preferred species to establish and occupy the environment. The Bradley Method is also preferred as it generally utilises small hand tools that create minimal disturbance to the soil and root structures of established plants.

However, it is important to note that the 'pure' Bradley Method does not advocate any replanting. In order to achieve the objectives of this management plan, a certain degree of replanting is proposed to supplement the Bradley Method.

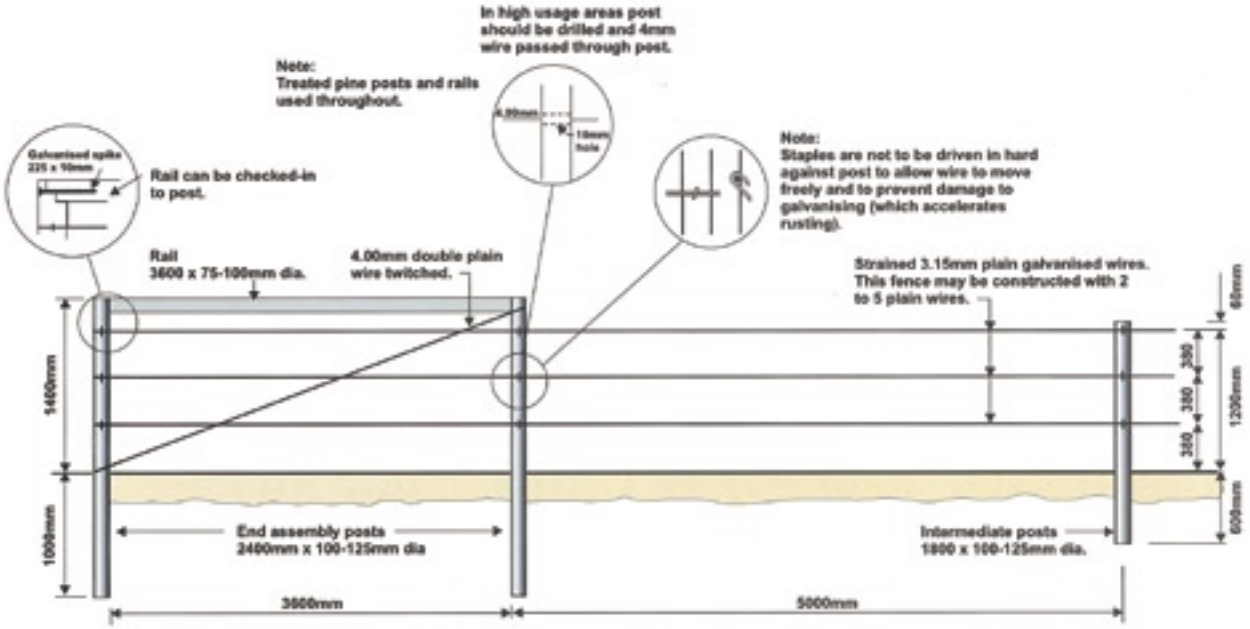
Bitou Bush flower and fruit

6.2 Reduction in width/extent of dune vegetation

Currently, the dune vegetation has gone beyond beach fences. This vegetation is predominantly *Acacia sophorae* (Coastal Wattle). *Leptospermum laevigatum* (Coastal Tea Tree) has also grown prolifically and requires reduction. The average width of the dune vegetation is to be approximately 15m (vary from 10-17m in width).

6.3 Construction of new protective fence

As part of Stage 1 and occurring after the removal of existing weeds, a protective fence is to be constructed. This is to be located along the seaward margin of the new dune field. Sand trapping mesh fencing should be used to deter access, define the vegetated dune area and to supplement the sand trapping capacity of the dune area that has had vegetation density reduced through weeding and thinning of the mid storey. Its location should be well-above the high water level so as to minimise the potential for damage/destruction by storm waves. A plain wire construction type fence is to be used. The main purpose of this simple protective fence is to deter access as well as defining the vegetated dune area. Ongoing maintenance by council beach crews is also to be taken into account. Sand build-up will also need to be monitored and removed occasionally, to be spread on the beach.



Example of wire fence to be used

NOTE: Sand trapping mesh to be attached to middle strand of fence and buried below existing sand level.

6.0 Dune Management Works

6.4 Selectively remove middle storey and dying/dead vegetation

The selective removal of pockets of middle story plants and dying/dead plants will provide better visual surveillance of the beach from The Esplanade, as well as providing viewsheds of Brisbane Water. This process will also be undertaken over a staged period of time by a registered bush regenerator. Plant material can be reused on site as mulching material.

Area where removal of dying/dead vegetation would provide better visual surveillance

6.5 Dune Revegetation

Upon reducing the width and density of vegetation, it will be important to replace and supplement vegetation cover through a successional planting regime. Occurring as part of Stage 1 this succession is to consist of primary species (grasses and creepers/groundcovers), secondary species (lower 'middle story' shrubs) and tertiary species (taller 'middle story' shrubs and canopy trees).

Planting should occur outside the hotter months of Summer, i.e. April to September, with a preference for Autumn plantings.

Watering of new plantings is essential during the first three months. The opportunity to establish a spear point water supply should be investigated in order to assist with the ongoing water needs of the dune system during the establishment of rehabilitation works.

6.51 Primary species

Primary species or ground covers and grasses will comprise the first line of planting from the seaward fence line. A 2m wide strip is to be planted approximately 1m back from the dune fence. These tubes (50-70mm) are to be planted at a rate of 9 plants per square metre.

Canavalia rosea (Beach Bean)	tubes@9 per sq m
Carpobrotus glaucescens (Pigs Face)	tubes@9 per sq m
Spinifex sericeus (Spinifex)	tubes@9 per sq m


Canavalia Rosea


Carpobrotus glaucescens


Spinifex sericeus

6.52 Secondary species

Secondary or lower-middle story species are to be planted as part of Stage 2 of works. These secondary species can be separated into plants growing under 1.5m in height, such as *Acacia sophorae, Correa alba* and *Lomandra longifolia* and those growing higher than 1.5m in height, such as *Monotoca elliptica* and *Myoporum acuminatum*. The latter two species are to be selectively placed, as they have a mature height which if planted in groupings would create quite dense stands, thus blocking views.

Acacia sophorae (Coastal Wattle, <1.5m height)	tubes@1m spacings
Correa alba (White Correa, <1.5m height)	tubes@0.75m spacing
Lomandra longifolia (Matt Rush Grass,<1.5m height)	tubes@6 per sq m
Monitoca elliptica (Tree broom-heath, >1.5m height)	5ltr@1.5m spacings
Myoporum acuminatum (Coastal Boobialla >1.5m height)	5ltr@1.5m spacings
Westringia fruiticosa (Coastal Rosemary, <1.5m height)	tubes@0.75m spacing


Acacia sophorae


Correa alba


Lomandra longifolia


Monitoca elliptica


Myoporum acuminatum

6.0 Dune Management Works

6.53 Tertiary species

Tertiary or upper story species are small-medium trees which would be planted, along with secondary species during Stage 2 of works. These upper story species would initially require under-pruning but will ultimately facilitate views beneath the canopy. See attached plan for approximate locations (primarily where there are gaps in the existing *Banksia integrifolias* - Appendix 1).

Acmena smithii (Lilly Pilly)	10@100ltr
Banksia integrifolia (Coastal Banksia)	20@200ltr
Cupaniopsis anacardioides (Tuckeroo)	10@100ltr
Eucalyptus botryoides (Bangalay)	5@100ltr


Acmena smithii


Banksia integrifolia


Cupaniopsis anacardioides


Eucalyptus botryoides

6.6 Remove and relocate amenity building

The demolition is to be undertaken/managed by Council during Stage 1. This will involve the recycling of materials. This removal will then allow the construction of a viewing platform on this level site. A noticeable viewshed of Brisbane Water will be created with the amenity building's removal. The new amenities are to be part of the multi-use building also to be constructed in Stage 1 as defined in the POM.

Existing amenity building at the end of Picnic Parade

6.7 Reshaping of dune at northern section

Due to the build up of sand adjacent to the existing fence in this location there exists an opportunity to reshape the sand dune to lower the build up of sand and fill the hollow created in the dune. This area is located between the northern-most beach access and the amenity building. The objective is to create a more uniform gradient down to the usable beach area. Currently, the dune rises above the level of The Esplanade.

This section will have its vegetation removed first, followed by reshaping using appropriate earth-moving equipment. This could be undertaken and managed by council.

Replanting of advanced tertiary species is proposed to provide immediate tall vegetation at the rear of the dune.

6.0 Dune Management Works

6.8 Construction of viewing platforms

The construction of two timber and steel viewing platforms is to occur within Stage 1. These viewing decks, providing elevated access from The Esplanade will provide extensive views across Brisbane Water. These platforms will also provide access to the beach (ramp). Consequently, the number of beach accesses will be reduced. Platforms are to be constructed in front of the Outrigger Resort and at the end of Picnic Pde, after the amenity building's removal.

Construction and materials is to be similar to viewing platforms at Umina and Terrigal. Design is to be certified by an engineer. Additional funds need to be allocated for on-going maintenance.

Additionally, low level planting is to be incorporated around the base of each viewing platform. This will act as a sand-catching mechanism, reducing the need to access underneath the viewing platforms to remove sand build-up.

Example of viewing platform at Umina

6.9 Construction of new wall

The construction of a low seating-height masonry wall along the landward side of the dune, along the alignment of the existing pine log fence is to occur during Stage 1. This feature wall, to be bagged and painted will define the landward edge of the vegetated dune, providing a secondary sand-capture barrier to The Esplanade. It will also act as a seating wall, contributing favourably to The Esplanade streetscape.

Indicative impression of low wall along The Esplanade

Rough surface finish on wall to discourage graffiti and vandalism

7.0 Maintenance Schedule

Duration	Inspection	Action
Weekly	Plant Moisture needs	Water as necessary
Monthly	Plant Growth	Replace lost plants as required
	Sandtrapping fence, sand build up	Remove sand build up and spread over beach to retain beach sand
6 monthly	Viewing deck - timber deck	Replace as required
	Sand buildup in front of decks	Remove sand build up and spread over beach to retain beach sand
	Sand trapping fence	Repair and replace as required
	Blow outs in dune revegetation	Regrade sand, replace vegetation and provide additional line of temporary fencing to protect vegetation
	Monitor beach sand width	If sand width reduces to within 5m of the sand-trapping fence sand nourishment from sand bars within adjacent Brisbane Water is to be considered

8.0 References

Buchanan R. 1989, *Bush Regeneration - Recovering Australian Landscapes*, TAFE Student Learning Publications, Sydney

DLWC 2001, *Coastal Dune Management: A Manual of Coastal Dune Management and Rehabiltation Techniques* (Coastal Unit, Newcastle)

EnviTE 1998*, Coastal Plant Propagation Manual – A Guide For Coastcare Groups in seed Collection and Plant Propagation Techniques on the North Coast of NSW* (Environmental Training and Employment, Lismore)

Patterson Britton and Partners 2000, *Ettalong Beach Bangalow St to Picnic Parade Foreshore Management Study and Plan*, for Gosford City Council

Williams S and Fiedler M 1998, *Attack of the Killer Weeds*, DWLC, Parramatta

Appendix 1
Ettalong Beach Draft Dune Management Plan

Ettalong Beach Dune Management Plan

- Objective:

  To revegetate and selectively reshape the dune so that from The Esplanade, the dune falls gradually toward the water level with vegetation consisting of a lower storey (to 1.5m height) and an upper storey (>4m height) to maintain view lines.

- Schedule of Works:

Stage 1 - Year 1 and 2

- Remove toilet block at Picnic Parade
- Remove and replace old dune fence to create 10m - 20m wide vegetated dune corridor
- The toe of the incipient dune could be reshaped beyond the line of the existing *Banksias*
- Maintain lower storey vegetation along road side of new dune fence
- Construct viewing decks at Memorial Avenue and Picnic Parade
- Remove vegetation seaward of new dune fence
- Selective weeding
- Initiate foreshore nourishment plan study
- Maintain lower storey vegetation, replant if required
- Selective removal of vegetation to provide viewing corridors
- Selective reshaping of sand dune to provide viewing corridors
- Planting of upper storey trees and middle storey plants
- Selective pruning of trees to raise lower canopy

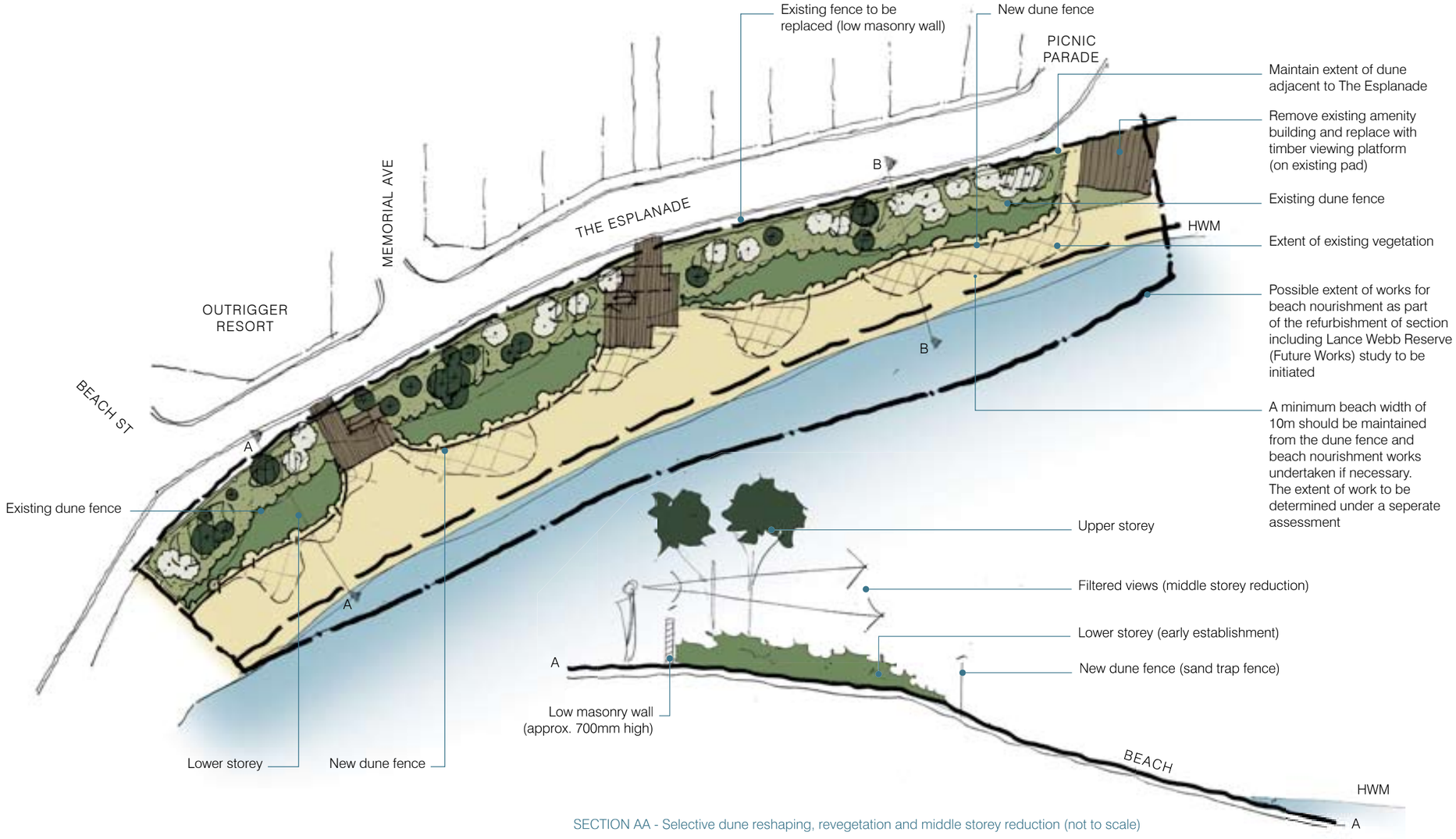
Stage 2 - When funds become available

- Construction of the viewing deck to be considered after other higher priority works identified under the Plan of Management are completed

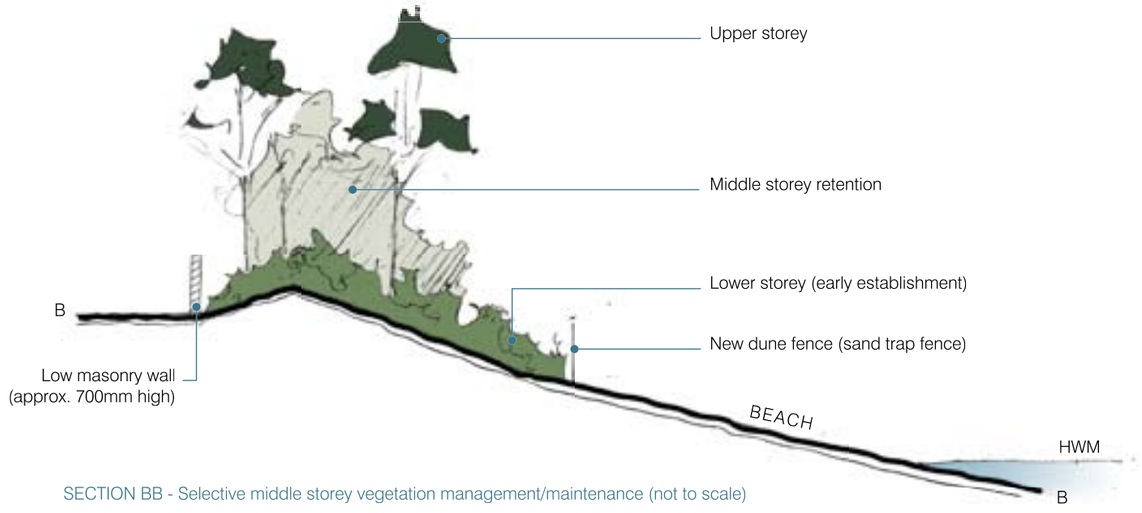
On going works as required

- Selective pruning of vegetation to maintain water views
- Maintain dune fence
- Selective weeding
- Remove sand from under decks and maintain lower storey vegetation
- Maintain timber decks
- Selective removal of sand deposits to maintain filtered water views
- Replanting of die back areas to maintain vegetation density
- Remove sand deposited on street if required

- Notes:
  - Due to existing *Banksia integrifolia* being found on the higher part of the dune (ie. adjacent to the road), changes and modifications to the surrounding dune should be kept to the minimum required in order to achieve the required objectives and avoid disturbance to the *Banksia integrifolia*.
  - The best place to reshape/lower the dune occurs between the Picnic Parade amenity block and the Eastern-most beach access.



SECTION AA - Selective dune reshaping, revegetation and middle storey reduction (not to scale)



SECTION BB - Selective middle storey vegetation management/maintenance (not to scale)

SPECIES LIST

Primary
Canavalia rosea
Carpobrotus glancescenes
Spinifex sericeus

Secondary
Acacia sophorae
Leptospermum laevigatum
Correa alba var alba
Westringia fruiticosa
Monotoca eliptica
Myporum acuminatum
Lomandra longifolia

Tertiary
Acmena smithii
Banksia integrifolia
Cupaniopsis anacardioides
Eucalyptus botryoides

Existing *Banksia integrifolia*

LEGEND

Proposed timber viewing platform and ramped beach access

Existing vegetation (to be removed)

Extent of works

Proposed beach fence

This plan forms part of the further development of the Ettalong Beach Reserve Plan of Management (EBRPOM) and should be read in conjunction with that document.

Comments on this plan and the EBRPOM should be forwarded to either:

Martin Dawson
Department of Lands
PO BOX 6 Maitland NSW

or

David Medcalf
Gosford City Council
PO BOX 21 Gosford NSW 2250

Copies of the Ettalong Beach Reserve Plan of Management and this document are available for viewing from the above offices.

GOSFORD CITY COUNCIL
CENTRAL COAST

Ettalong Beach Dune Management Plan

Gosford City Council

SCALE 1:500@A1
DATE: JULY 2006 JOB NO. 05021 REV B

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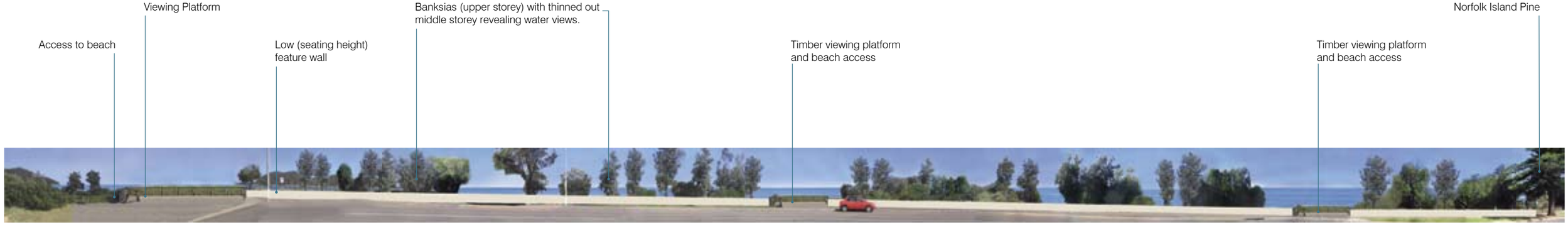
Appendix 2
Panorama Montages

Before



After

Ettalong Beach Reserve Plan of Management

Gosford City Council

DATE: DECEMBER 2005 JOB NO. 05021

Andrews.Neil