TECHNICAL REPORT

# Dongara to Cape Burney: Visual Landscape Assessment

October 2011

**Prepared by:**
Ecoscape (Australia) Pty Ltd

**Prepared for:**

Department of Planning
GOVERNMENT OF WESTERN AUSTRALIA

Western Australian Planning Commission

City of Greater Geraldton
a vibrant future

**The Department of Planning engaged Ecoscape (Australia) Pty Ltd to prepare this report as a background technical guidance document only.**


## Ecoscape (Australia) Pty Ltd

Ecoscape (Australia) Pty Ltd
PO Box 50/9 Stirling Hwy
North Fremantle WA 6159
Tel: (08) 9430 8955



Published by the
Western Australian Planning Commission
140 William Street
Perth WA 6000

Locked Bag 2506
Perth WA 6001

Published October 2011

website: www.planning.wa.gov.au
email: corporate@planning.wa.gov.au

tel: 08 655 19000
fax: 08 655 19001
National Relay Service: 13 36 77
infoline: 1800 626 477

# Table of Contents

# List of Tables



# List of Figures

# List of Plates

# List of Maps

# 1.0 Introduction

## 1.1 Scope

Increased development pressure between Dongara and Cape Burney has prompted the need for coastal planning and the management of visual landscape character and heritage. Ecoscape was engaged by the Department of Planning (DoP) to undertake a visual landscape assessment of the study area and to develop key findings to manage visual landscape character for inclusion into the overall coastal planning. The key findings are based on Ecoscape's interpretation of the study area, and the WAPC's Visual Landscape Planning Manual (WAPC, 2008).

## 1.2 Aims

The aim of this assessment was to verify the landscape assessment work undertaken by the DoP and develop key findings for landscape management and design guidelines for future development within the study area. The assessment will provide developers and stakeholders with guidelines that will ensure the appropriate management of landscape character according to the identified visual landscape management objectives for the coastal strip between Dongara and Cape Burney.

## 1.3 Method

Ecoscape conducted a data review of the DoP assessment of Landscape Character and undertook a site reconnaissance, an evaluation of landscape values, recreations sites, visual access, viewsheds, cross section analysis and the identifed design opportunities.

## 1.4 Study Area

The study area is the coastal strip about 50 kilometres long and about 3.5 kilometres wide, located west of the Brand Highway to the coast from Dongara to S Bend and the west of Company Road to Cape Burney (**Map 1**).


Map 1

FEB 2010

*Dongara to Cape Burney Visual Landscape Assessment*

Study Area

prepared for DEPARTMENT OF PLANNING

0 2 4 6 8 10 Kilometres

1:250,000 @ A4

Project No. 2349-09

ecoscape

# 2.0 Landscape Character

## 2.1 Overview of Study Area

A landscape study was done by the former Department of Conservation and Land Management (CALM, 1994) which classified Western Australian landscapes into character types. The main objective was to provide a reference guide to assess the representation and significance of WA's visual landscape to develop appropriate planning and design guidelines and polices to protect and enhance the visual landscape. The term landscape is defined as a combination of physical and cultural features. Landscape character is where there is a common combination of these features such as landform, hydrology, vegetation and land use (CALM, 1994).

The study area occurs within the Geraldton Plain landscape character type, a sub-type of the Wheatbelt Plateau which also includes the Dryandra Uplands, Merredin Plateau and Esperance Plain (CALM, 1994).

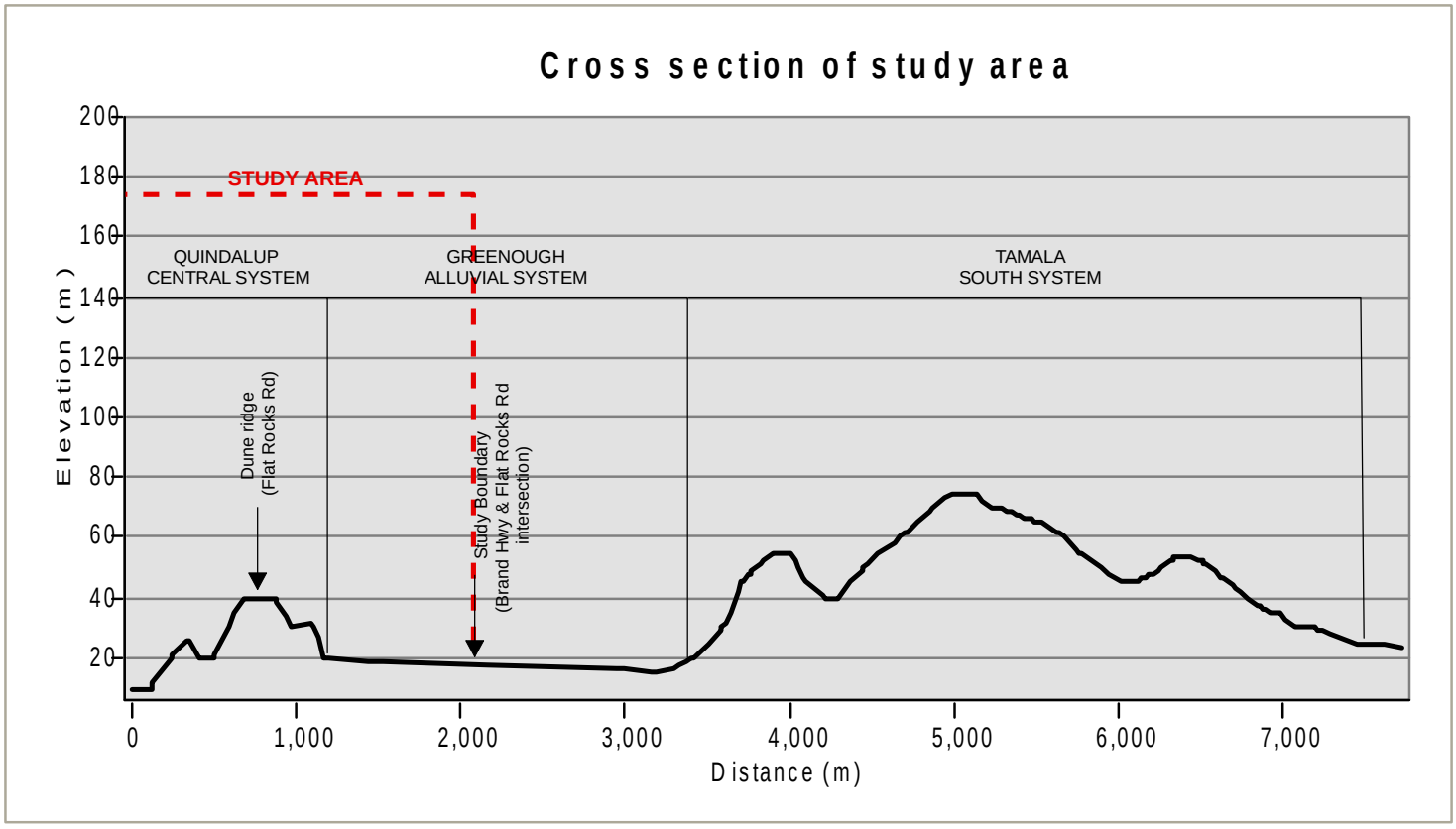
The Geraldton Plain extends about 25 kilometres north of Gregory and about 130-150 kilometres inland beyond Mullewa in the north east and to Morawa in the east and about in the south it extend to about 35 kilometres north of Iancelin. **Figure 1** illustrates the extent of the Geradton Plain and its surrounding landscape character types, which are the:

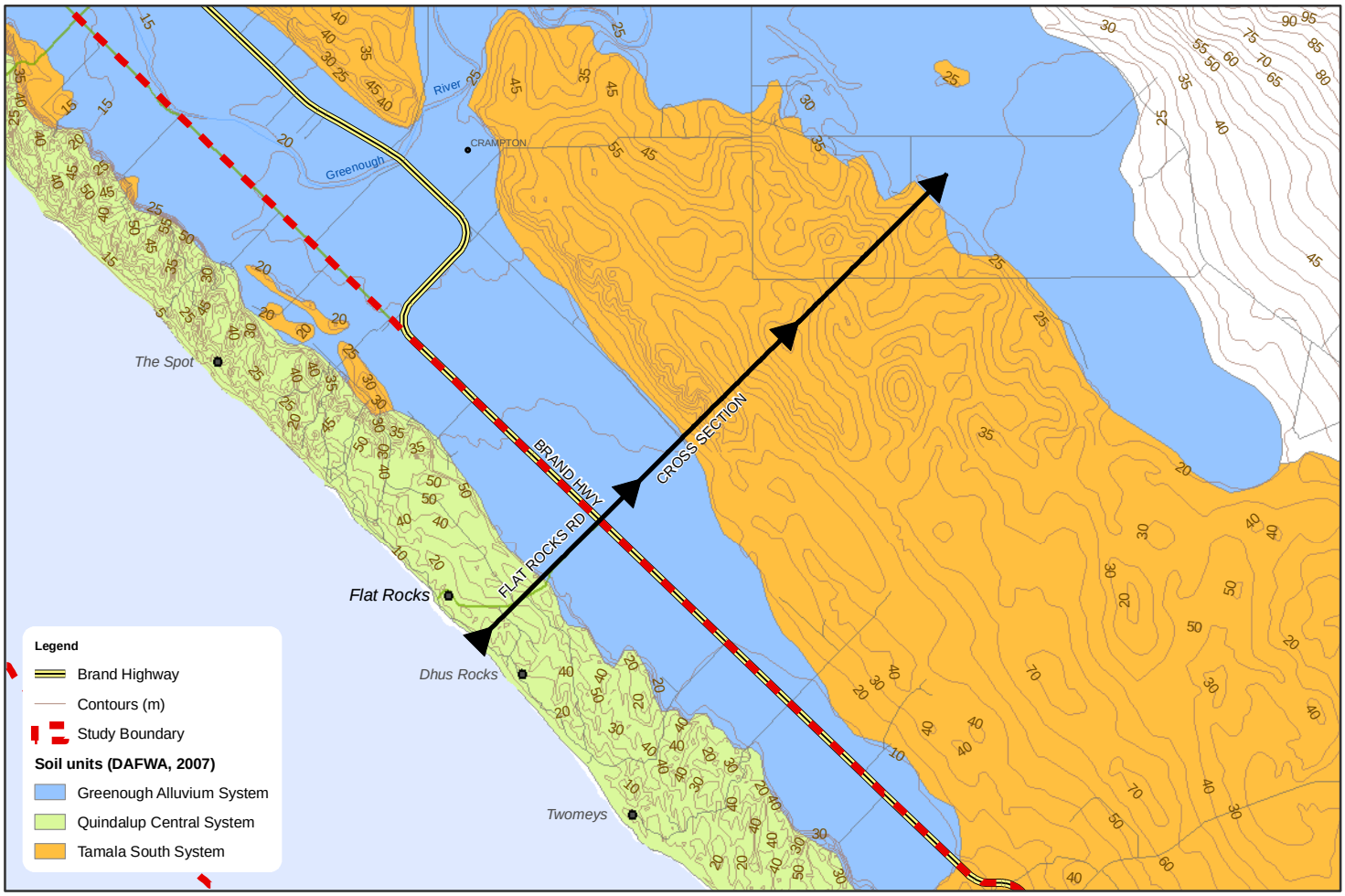
- Kalbarri Sandplain in the north
- Talisker Plain also to the north located between the Kalbarri Sandplain and Meekatharra Plateau
- Meekatharra Plateau to the east
- Dryandra Uplands to the south east
- Swan Coastal Plain to the south.

The Geraldton Plain is an extensive and varied landscape and is at the northern extent of the wheatbelt agricultural region. It extends from the coastline which is characterised by rocky shorelines, exposed mobile dunes and shrub covered dunes across open alluvial flats and steep flat topped ranges to the east. The alluvial flats are separated by a limestone ridge and are known as the Greenough 'front' flats and 'back' flats (CALM, 1994).

Geraldton is the major centre which operates as a commercial, tourist and port town. The study area is about 10 kilometres to the south of Geraldton, starting at Cape Burney and extends south to Dongara. It is primarily located within the coastal region and alluvial plains ('front' flats) of the Geraldton Plain. The defining features are the coastline, shrub covered dunes, undulating low hills, open alluvial plain of the 'front' flats and historic features.


**Figure 1. Landscape Character Types (CALM, 1994)**




Map 2

FEB 2010

*Dongara to Cape Burney Visual Landscape Assessment*

Cross Section at Flat Rocks

prepared for DEPARTMENT OF PLANNING

0 0.5 1 1.5 2 Kilometres

1:80,000 @ A4

Project No. 2349-09

ecoscape

Refer to **Appendix 1** for general information on the *Geraldton Plain* Landscape Character type.

The following sections describe the landscape characteristics of the study area.

### LANDFORMS/SOILS

The study area is characterised by the following soil landscape systems (DAFWA, 2007):

- the variable relief of the mobile coastal dunes, part of the Quindalup Central system
- the flat plains of the Greenough Alluvial system
- the gradual relief of the Tamala South system.

The most defining landform feature of the study area is the coastal dune ridge that runs parallel to the Brand Highway for about 35 kilometres from Devlin Pool Road in the north to about Mt Horner Road in the south. Here the landform becomes more undulating and variable and is associated with the Tamala South system which ranges in elevation from 10 – 40 metres above sea level (Landgate). The dune ridge is part of the Quindalup Central system which is the dominant landform unit within the study boundary. The dune ridge ranges in elevation from 55 to 75 metres above sea level and is of variable relief with up to moderately steep slopes (Curtin, 2006) particularly where the dune system abuts the flats.

**Map 2** illustrates a cross section of the study area from Flat Rocks in the Quindalup system across the Greenough flats to the Tamala System

Soil contributes to the vegetation type and pattern and also influences the land use. The Greenough flats were formed by an accumulation of alluvial deposits from the Greenough River, resulting in deep fertile soil. It is characterised by a flat plain with low relief ranging in elevation from 5-20 metres above sea level (Landgate). The soil systems of the study area are outlined in the table below.

**Table 1. Soil landscape units within the study area (DAFWA, 2007)**

| NAME | LANDFORM | SOIL | VEGETATION | LOCATION |
|---|---|---|---|---|
| Quindalup Central System | Coastal dune system: foredunes, beach ridge plains, parabolic dunes, deflation basins and flats | Calcareous deep and shallow sands | Coastal heathlands and scrub | The dominant unit of the study area, extends from Cape Burney to the southern study boundary. South of Bookara Road, the dune systems extends closer to Brand Highway. |
| Greenough Alluvium System | Level alluvial plain with areas of minor terracing | Red sandy and loamy earths, hard cracking and self-mulching clays | Acacia rostellifera shrubland and river red gum woodland | Occurs east of the dune system from about Devlin Pool Road in the north to about Bookara Road in the south. |
| Tamala South System | Rises and low hills with relict dunes and some limestone outcrop | Yellow/brown shallow sands, yellow deep sands also Calcareous shallow sands and rock outcrop | Banksia low woodlands and heathlands | Occurs in small patches between the dune and alluvial systems north of 'S Bend'. Then south of Bookara Road where the alluvial plain ends, the Tamala system occurs (east of the dune system). |

## HYDROLOGY

The study area is within the Greenough Drainage Basin, which is drained by the Chapman, Greenough and Irwin Rivers. The basin covers an area of about 2.5 million hectares and over 90% is agricultural land (DEWHA, 2007). The basin extends about 100 kilometres north of Geraldton town centre to Bluff Point, 230 kilometres north east of Geraldton and about 100 kilometres to the south.

The dominant watercourse visible within the study area is the Greenough River which is 211 km long and drains 13 200 square kilometres. It originates north-east of Mullewa and flows mostly through agricultural lands. The sandbar at the river mouth, at Cape Burney, is only open after significant flows.

The Greenough River flows permanently for about six kilometres from Cape Burney due to the tidal influence of the ocean. This portion of the river is situated amongst extensive remnant vegetation and provides a significant viewing experience with a walk trail and lookout points from Devlin Pool Road to Cape Burney.

From Cape Burney the river meanders in a south east direction for about 20 kilometres running roughly parallel to Brand Highway. It is located within one kilometre to the west of the highway but is not visually evident for the most part due to lack of fringing natural vegetation which has been cleared for cropping. About 1.5 kilometres north of the S Bend on Brand Highway, the river changes direction and heads north east towards the inland ranges.

## VEGETATION

The predominant vegetation characteristics of the study area are the coastal shrublands of the dune system and cleared agricultural flats with occasional patches of remnant vegetation such as *Melaleuca cardiophylla, Melaleuca thymoides* and *Eucalyptus camaldulensis*. The southern portion of the study area is more vegetated and undulating than the flat open plains to the north. In the northern half of the study area, the River Gum (*Eucalyptus camaldulensis*) occurs on the river banks and is scattered across the floodplain. This tree is the characteristic 'leaning tree' of the Greenough flats, an indication of the consistently high wind speeds experienced in the area.

Five broad vegetation units (Beard 1976) occur within the study area:

- 125 - Bare areas; salt lakes
- 129 - Bare areas; drift sand
- 371 - Low forest; *Acacia rostellifera* and isolated *Eucalyptus camaldulensis* trees
- 431 - Shrublands; *Acacia rostellifera* open scrub
- 433 - Mosaic: Shrublands; *Acacia rostellifera & Melaleuca cardiophylla* thicket / Sparse low woodland

Ecoscape (2009) undertook a vegetation assessment of the study area in Spring 2009 and identified the following eight vegetation communities:

1.Riparian *Eucalyptus camaldulensis*

2.Estuarine *Casuarina obesa / Tecticornia spp*.

3.Foredune and Primary Dune *Atriplex / Scaevola/ Spinifex*

4.Foredune *Nitraria billardierei* open shrubland

5.Low Coastal *Scaevola / Rhagodia / Templetonia / Alyxia* shrubland

6.Taller Dune Slope *Acacia rostellifera / Alyxia / Melaleuca depressa / Templetonia*

7.Melaleuca forest or tall shrubland

8.Mallee *Eucalyptus obtusiflora / E. oraria*

Vegetation communities 5, 6 and 7 are the dominant types of the study area and occur on the dune system. The typical species of each community are:

- Plant community 1: *Eucalyptus camaldulensis*
- Plant community 2: *Casuarina obesa, Tecticornia indica subsp. bidens, Tecticornia sp., Threlkeldia diffusa*
- Plant community 3: *Threlkeldia diffusa, Spinifex longifolius, Tetragonia decumbens, Scaevola crassifolia, Angianthus cunninghamii, Olearia axillaris, Spinifex longifolius, Atriplex* species
- Plant community 4: *Nitraria billardierei, Atriplex amnicola, Spinifex longifolius, Threlkeldia diffusa*
- Plant community 5: *Scaevola crassifolia, Rhagodia preissii, Templetonia retusa, Alyxia buxifolia, Thryptomene baeckeacea, Olearia axillaris, Rhagodia latifolia subsp. Recta*
- Plant community 6: *Melaleuca depressa, Templetonia retusa, Acacia rostellifera, Alyxia buxifolia*
- Plant community 7: *Melaleuca lanceolata, Melaleuca cardiophylla, Melaleuca huegelii tall Shrubland*
- Plant community 8: *Eucalyptus obtusiflora, Eucalyptus oraria, Acanthocarpus preissii, Westringia dampieri, Rhagodia latifolia subsp. recta*

## LAND USE

The study area can be divided into two broad land use categories; cleared agricultural land on the coastal plain and uncleared native vegetation of the coastal dunes.

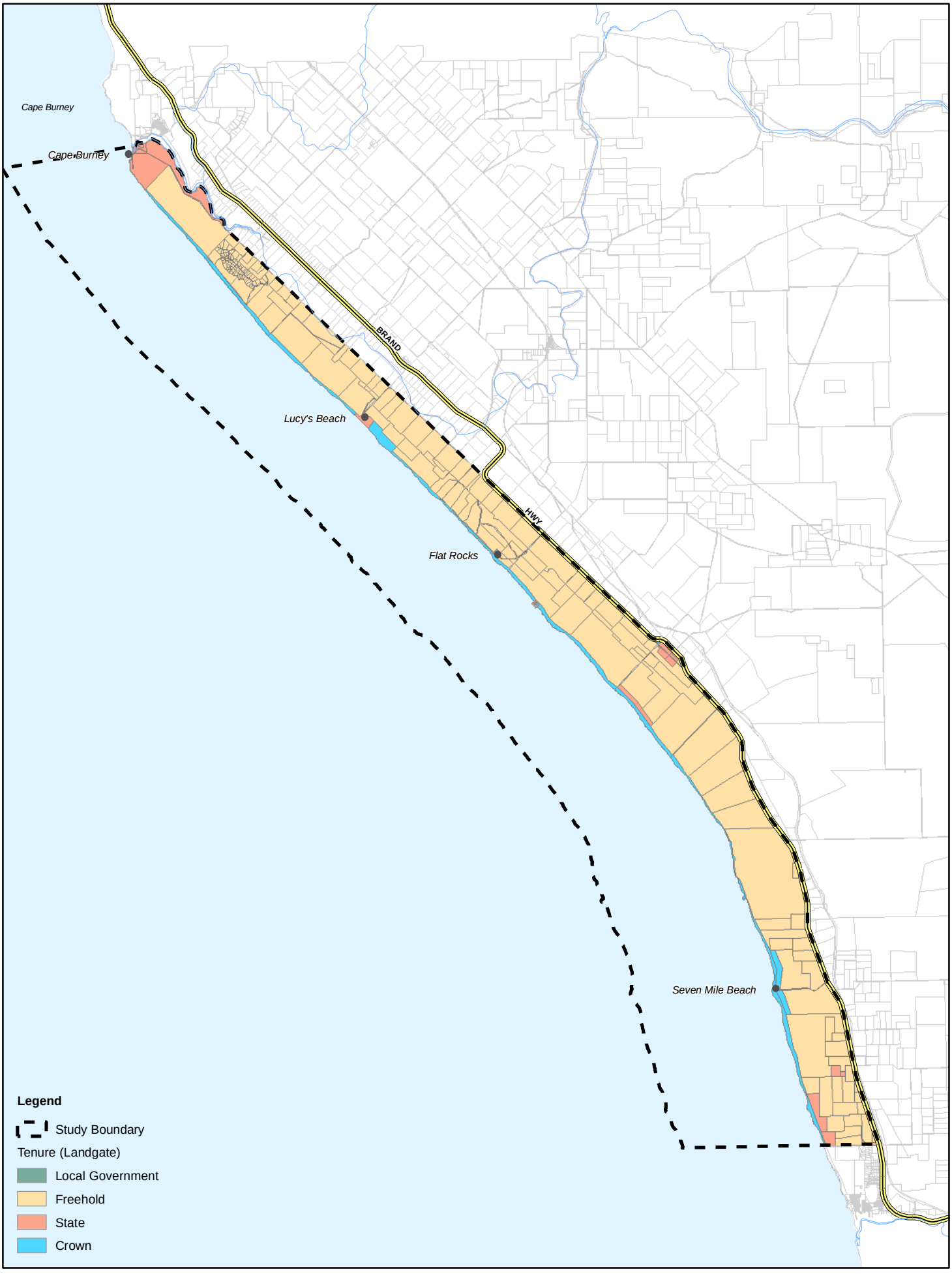
The historic land use of the flats was cropping and grazing which began in the 1850s, cropping continues to exist on the coastal plain. The historic stone structures that are evident in the Greenough area were built in the 1870s-1880s (City of Geraldton-Greenough, no date). The dunes consist of remnant vegetation with some dwellings dotted throughout this unit. Some areas have been cleared for grazing such as the area that is now West Bank Estate. Recreation is also a large feature, particularly on the coast which is popular for four wheel driving, wind sports, surfing, fishing and diving off the reefs and shipwrecks.

Most of the area within the study boundary is private tenure with minimal public access options to the coast. As a result, uncontrolled access is a management issue in the study area. A foreshore strip of Unallocated Crown Land (UCL) about 130-150 metres wide occurs from Cape Burney to Nine Mile Beach, it then narrows to about 50 metres to the southern boundary. A few local reserves exist at Lucy's Beach and at Cape Burney.

The configuration of the lots varies within the study area. The area north of the West Bank Estate consists of crown land and one large privately owned lot. The area south of west bank estate to about Bookara Road is divided into rectangular lots orientated in a SW-NE direction. There are generally two rows of lots; those on the cleared flats and those on the dunes. The lots on the alluvial flats are smaller than the lots on the dune system and some have their western boundary extending into the dunes. Between Bookara Road and 3.5 kilometres south of Nine Mile Beach the lots are generally larger and extend from the crown land on the coast to the Brand Highway. They also change orientation slightly to an ENE-WSW direction. Three and a half kilometres south of Nine Mile Beach the lots are smaller and irregularly orientated between the coast and Brand Highway.

**Map 3** illustrates the tenure of the study area.

The landform/soil units, hydrology, Beard vegetation extent and landuse are illustrated on **Map 4** 'Existing Environment'.




Map 3

*Dongara to Cape Burney Visual Landscape Assessment*

Tenure within the study boundary

FEB 2010

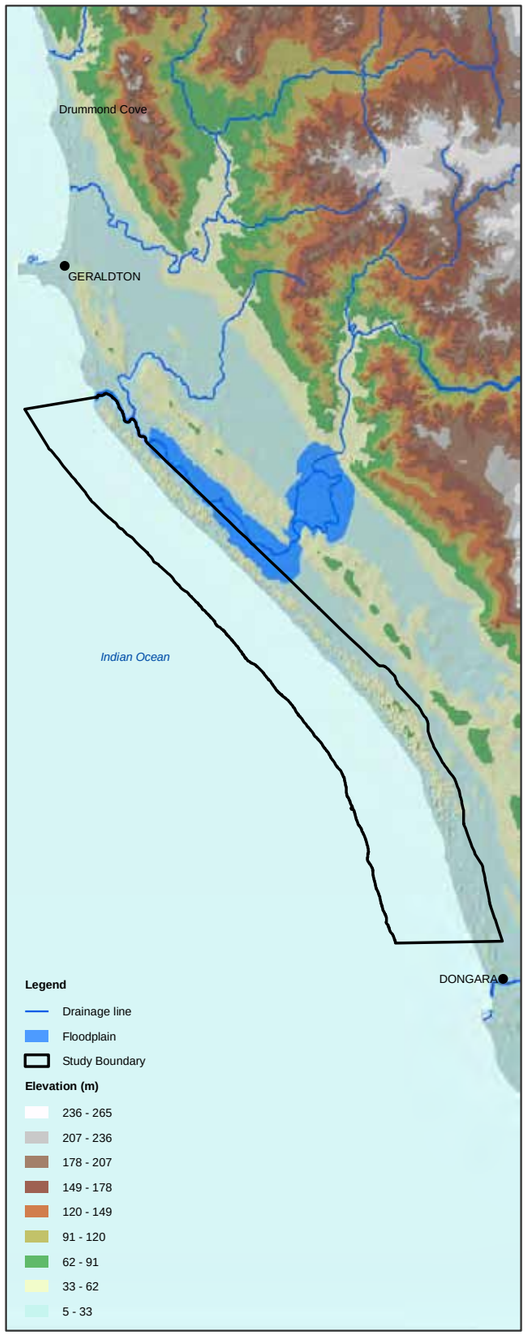
prepared for DEPARTMENT OF PLANNING

0 1 2 3 4 5 Kilometres

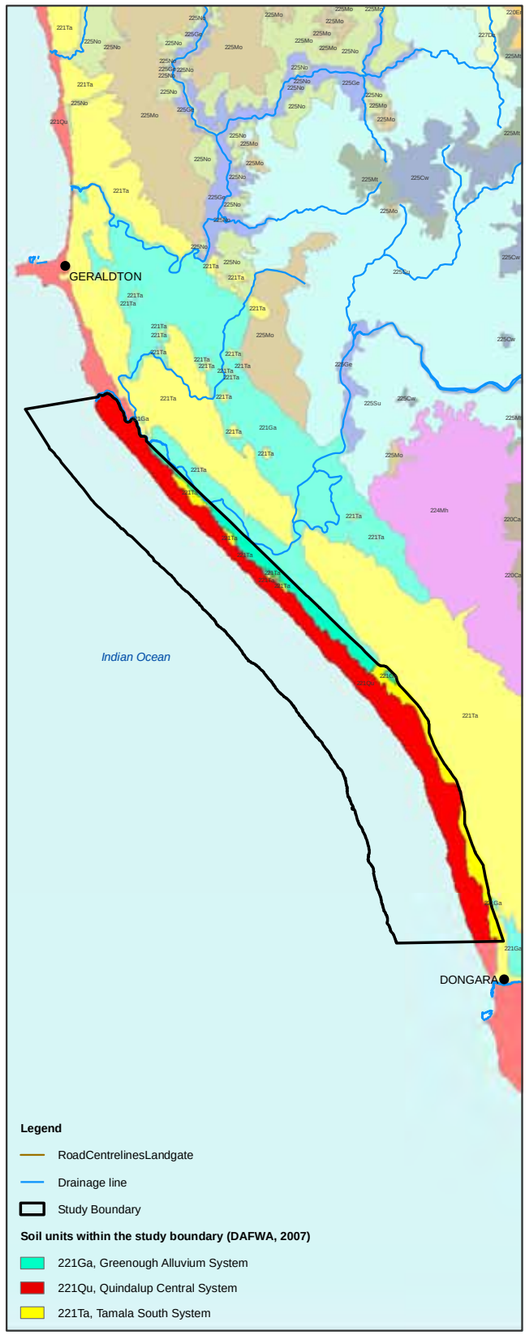
1:195,000 @ A4

Project No. 2349-09

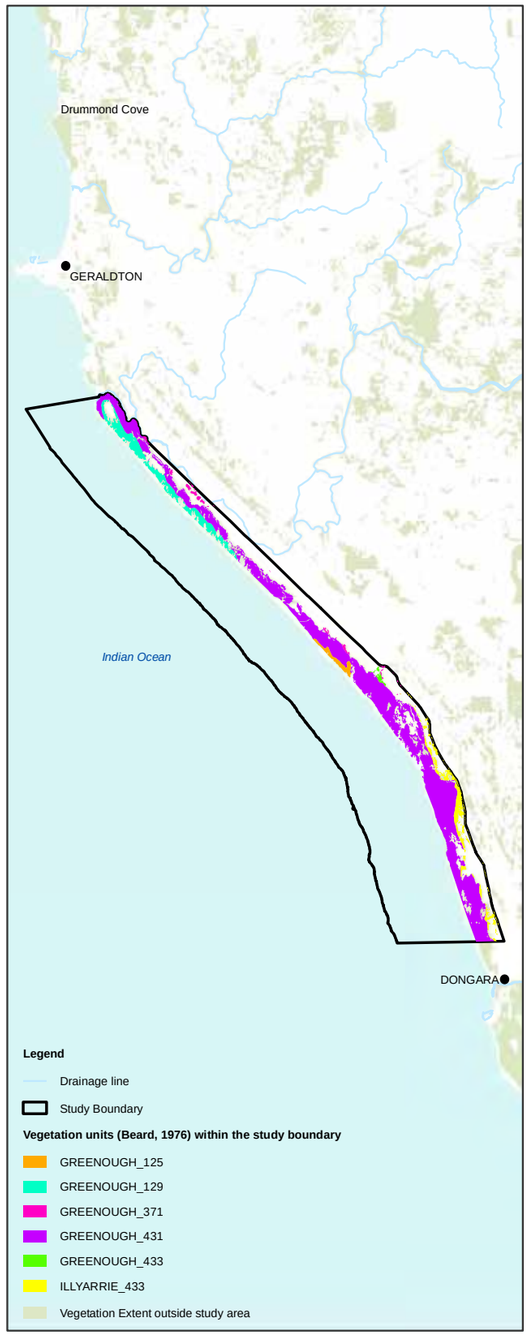
ecoscape



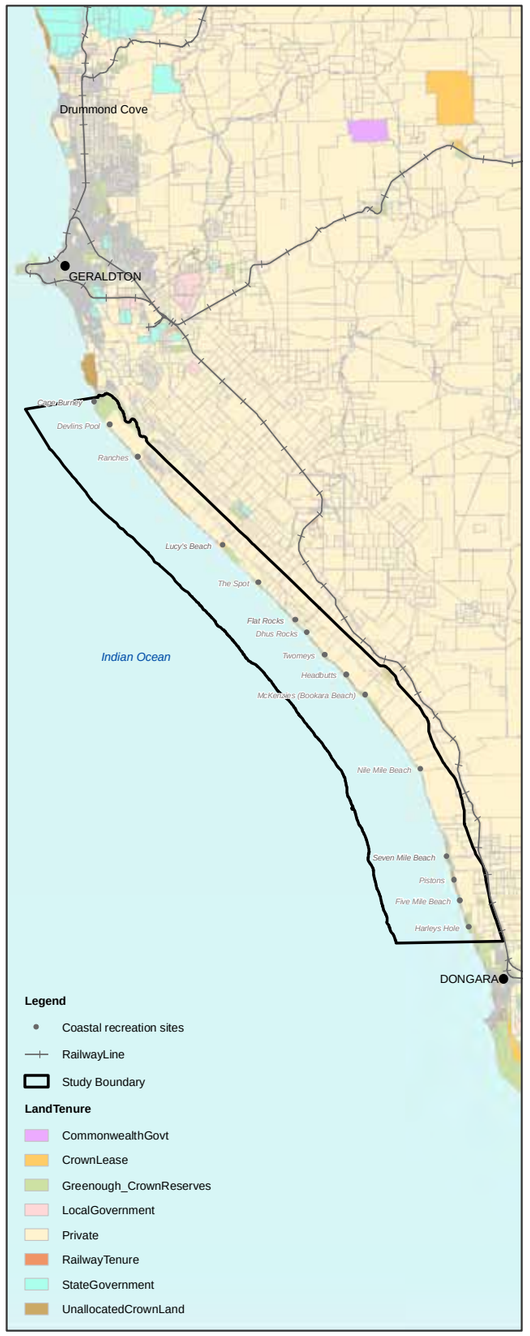

Topography




Soil




Vegetation




Land Use

Base data supplied by the DoP

**Map 4**

FEB 2010

*Dongara to Cape Burney Visual Landscape Assessment*

**Existing Environment**

prepared for DEPARTMENT OF PLANNING

0 2 4 6 8 10 Kilometres

1:400,000 @ A3

Project No. 2349-09

ecoscape

## 2.2 Landscape Character Units

A landscape character unit is a geographic area sharing common characteristics such as landform, vegetation, waterform and cultural land use patterns relevant to human interaction and experience. The DoP identified the landscape character units of the study area and Ecoscape verified these units from fieldwork and desktop analysis. The identified landscape character units display particular aesthetic characteristics which relate to form, line, colour, texture, scale, vegetation, waterform and land use. Two units and five sub-units were identified:

1. **Dune System**

i. DS-A (bordered by Greenough River)

ii. DS-B (West Bank Estate to Nine Mile Beach)

iii. DS-C (Nine Mile Beach to Dongara)

2. **Coastal Plain**

i. CP-A (Greenough 'Front' Flats, including sub-units CP-A1 and CP-A2)

ii. CP-B (Wakeford Road to Dongara)

### DUNE SYSTEM

The dune system is predominantly a natural character unit, comprised of native vegetation, although grazing has reduced the natural species diversity and introduced weeds including grasses and woody weeds such as boxthorn. It comprises three basic elements: a sandy coastline with a relatively narrow beach, occasional shoreline reefs and rock platforms; a vegetated dune system with north-south trending ridges, swales and blowouts, with several plateau-like areas that extend the width of the dune system in these locations; and a distinctive, continuous, scarp-like dune face that produces an undulating skyline as viewed from locations to the east. The coastline is orientated in a NW to SE direction from the northern study boundary to approximately Nine Mile Beach and then changes orientation to run in a NNW to SSE direction. This change in orientation is reflected in the dune ridge that runs adjacent to Brand Highway, where the angle of change has resulted in a conspicuous dune profile near Butcher Road.

This unit has been mapped as three sub-units, distinguished from each other primarily on the basis of coastline orientation, beach characteristics, amount of exposed sand throughout the dunes, width of the system and nature of the eastern edge of the system.

A. <u>Bordered by Greenough River (DS-A)</u>

This sub-unit is located between the coast and Greenough River from Cape Burney to the northern extent of the West Bank Estate. The elevation ranges from 5-55 metres above sea level (landgate). The character of this small sub-unit is natural with no cleared areas and differs from the remainder of the dune system as it contains a sizeable detached mobile dune sheet, is bordered by the Greenough River and appears to contain some relatively pristine, riverine vegetation communities along its inland edge. Typical vegetation species occurring within this sub-unit are:

- *Casuarina obesa* woodland and samphires (*Tecticornia species*) along the river edge

- pockets of tall Shrubland and woodlands of *Melaleuca lanceolata*, *Melaleuca cardiophylla, Melaleuca huegelii* near the river
- coastal shrublands on the dunes of *Acacia rostellifera, Alyxia buxifolia, Rhagodia baccata, Rhagodia preissii, Scaevola crassifolia, Olearia axillaris, Rhagodia latifolia subsp. recta, Melaleuca depressa, Templetonia retusa*
- coastal foredune vegetation of *Scaevola crassifolia, Angianthus cunninghamii, Olearia axillaris, Spinifex longifolius, Atriplex* species.

The Greenough river nature trail with lookout points occurs along the river and provides key views of this landscape.

Plate 1. DS-A Greenough River

B. West Bank Estate to Nine Mile Beach (DS-B)

This sub-unit is the most extensive in the study area and contains West Bank Estate which is the only 'rural residential estate' in the study area. Another approved subdivision occurs at Red Emperor Drive. This sub unit runs parallel to the coast and is of a roughly similar width along its entire length, other than its southern extremity, at Bookara, where there is a cleared plateau area similar to one south of Nine Mile Beach. The other large cleared area is the West Bank Estate at the northern extent of the sub-unit. Elevation ranges from 5-70 metres above sea level (landgate) with the highest points between West Bank Estate and Lucy's Beach to the south and also near Bookara, where the dune system begins to change direction.

An extensive dune system of similar dune forms covered by coastal vegetation is characteristic of this sub-unit. There are generally similar dune formations throughout, including a degree of exposed sand, mainly in the form of blowouts extending northwards in narrow fingers connected to the beach. There is a greater amount of more exposed sand in the northern half, adjacent to the Greenough River. Exposed rocky coastlines are also a feature of this unit. The typical vegetation species occurring within these dunes are:

- coastal foredune vegetation of *Scaevola crassifolia*, *Angianthus cunninghamii, Olearia axillaris, Spinifex longifolius, Atriplex* species.
- secondary dune vegetation of *Scaevola crassifolia, Rhagodia preissii, Templetonia retusa and Alyxia buxifolia open mid shrubland, or Thryptomene baeckeacea*
- taller dune vegetation of *Acacia rostellifera, Alyxia buxifolia, Melaleuca depressa and Templetonia retusa*

Plate 2. DS-B Extensive Dune System

- pockets of *Melaleuca lanceolata Forest or Melaleuca cardiophylla and Melaleuca huegelii* in the dune swales
- small areas of *Eucalyptus obtusiflora and Eucalyptus oraria* mallee

There is good access to two coastal sites; Lucy's Beach and Flat Rocks and there are many 4WD sand tracks generally running parallel to the coastline.

Plate 3. DS-B Rocky Coastline

C. Nine Mile Beach to Dongara (DS-C)

The extent of this unit is from Nine Mile Beach to the southern boundary. At Nine Mile Beach the coast changes orientation from a NW-SE direction to a NNW – SSE direction. Part of this unit extends to Brand Highway near Mount Horner Rd. The southern extent of this unit is located about 3 km north of the Dongara townsite. This sub-unit is of more variable width and character, with several flatter portions. The elevation ranges from 5-70 metres above sea level (Landgate) with the highest points occurring near the northern extent of the sub-unit where the dune system extends to Brand Highway. The relief becomes more gradual from about Seven Mile to the southern extent of the sub-unit where elevation ranges from 5-40 metres above sea level (Landgate).

The dunes have almost no exposed sand areas and a thick cover of coastal vegetation. The narrow beach exhibits more benign conditions than the coastline north of Nine Mile Beach as it is not as exposed to the south west weather conditions. The vegetation of this sub-unit is made up of similar species to the northern sub-unit (DS-B) however the plant communities occur in more of a mosaic pattern as opposed to individual communities. This may be due the wider extent of the dunes and greater variety in relief that characterises this sub-unit.

The dunes are more developed than areas to the north, with cleared areas and scattered houses. The lots are positioned irregularly throughout the dunes with numerous tracks/firebreaks evident along fence lines. There are some cleared areas in the dunes with the largest area occurring north of Seven Mile Road.

Plate 4. DS-C Stable vegetated dunes and sheltered bay

Plate 5. DS-C Dune System extending to Brand Highway

## COASTAL PLAIN

Within the study area the coastal plain unit is bounded by the study area boundary on its east (comprising the Brand Highway, Company Road and the Greenough River), and the dune system to the west, although the unit actually itself extends further inland and extends into a low limestone ridge that separates the area commonly known as the 'Front Flats' along the Greenough River from the 'Back Flats'.

The northern extremity of this unit ends where the Greenough River flows immediately adjacent to the dune system, with no adjoining floodplain. At its southern end, a sand low ridge oriented east-west creates enclosure.

A. Greenough 'Front' Flats (CP-A)

The Greenough Flats, or 'Front Flats', comprises the flat floodplain of the Greenough River. It has been divided into two minor sub-units; Greenough Flats adjacent to the river (CP-A1) and Greenough Flats south of the river (CP-A2).

The Greenough Flats are a rural character unit and have been almost entirely cleared for cropping. Strong south-westerly winds have resulted in susceptible trees developing a very distinctive lean. Planted windbreaks comprise only several species, tamarisk and tuart, neither of which are local. The Flats have a number of early European structures, some of which are still used and others that comprise ruins. Most are constructed of limestone. Both used and disused structures contribute to the landscape character of this unit, regardless of their formal heritage status.

Plate 6. CP-A1 heritage listed site 'Gray's Store'

i. Greenough Flats adjacent to river (CP-A1)

The portion of the Flats adjacent to the Greenough River is slightly more undulating than the floodplain south of 'S Bend', and it includes some areas of remnant vegetation. Elevation ranges from 10-30 metres above sea level (Landgate). The river itself is not a prominent feature, as most of its fringing vegetation has been cleared except for a few river gums (*Eucalyptus camaldulensis*). There are some small patches of vegetation between the river and the dune south of Phillips Road. These remnants include species such as; *Eucalyptus obtusiflora* and *Eucalyptus oraria* (mallee), *Melaleuca lanceolata* and *Acacia rostellifera*.

This portion of the study area has a distinctive heritage character, with a number of structures listed on the State and National Heritage Register. Many of these are to the east of the study area, such as the Pioneer Museum on Phillips Road, Wesley Chapel, Maley's Bridge (undergoing restoration) and Gray's store on McCartney Road and the Hampton Arms Inn on Company Road. Company Road in on the eastern boundary of this landscape character unit and was built by convicts in the 1860s. It was named after 'The Cattle Company' which leased 60,000 acres in the area (City of Geraldton-Greenough, no date).

The Greenough Historic Settlement is located nearby off McCartney Road to the east of Brand Highway and has been classified by the National Trust as a heritage conservation area which has been a long term restoration project (City of Geraldton-Greenough, no date). See **Appendix 2** for a list of heritage sites in the Greenough area.

Contemporary buildings are generally located at the base and up on the face of the dunes as some of the lot boundaries extend into the dune system.

Plate 7. CP-A1 Contemporary houses located at base of dunes

ii. Greenough Flats south of river (CP-A2)

This flat, featureless plain has almost no remnant or planted vegetation, and few buildings. Elevation of the plain ranges from 10-20 metres above sea level (landgate ref). The cadastral lots are larger than those to the north with some extending into the dune system. Large areas of weeds are noticeable along the base of the dunes north of Henry road. The weed species are: Giant Reed, Tamarisk and Castor Oil plant.

Plate 8. CP-A2 flat cleared plain

B. Wakeford Road to Dongara (CP-B)

The coastal plain unit is bounded to the north by the small dune ridge that encloses the southern end of the Flats. It is generally of a rural character with some natural elements due to greater diversity in landform and natural vegetation. The unit is discontinuous where the dune extends across to Brand Highway just south of Nine Mile Beach. Its width is variable, depending on the width of the dune system, which varies more here than in the northern sections. The elevation ranges from 10-40 metres above sea level (Landgate) which contrasts with the flat and low terrain of the flats of CP-A2 which ranges from 10-20 metres above sea level (Landgate).

This section of the coastal plain is visually different from the Greenough Flats to the north which is due to the change in landform from the Greenough Alluvial System to the Tamala South System (DAFWA, 2007). The Tamala South System is characterised by low hills and rises with some limestone outcropping As a result the terrain of this landscape character unit is varied with several gently contoured basins or swales. These gentle swales are interspersed with areas that are undulating or contain low dunes and/or patches of remnant vegetation. The typical vegetation species being; *Acacia rostellifera, Melaleuca huegelii, Eucalyptus oraria and Eucalyptus obtusiflora*.

The lot boundaries to the north of Nine Mile are large and extend from Brand Highway to the crown land on the coast. South of Nine Mile the lots are smaller and located in an irregular pattern, as a result, a few more houses and other structures are noticeable from the highway compared to further north.

Plate 9. CP-B Undulating vegetated plain

## 2.3 Landscape Features

At the largest scale, the landscape features of the study area comprise the basic character units and sub-units:

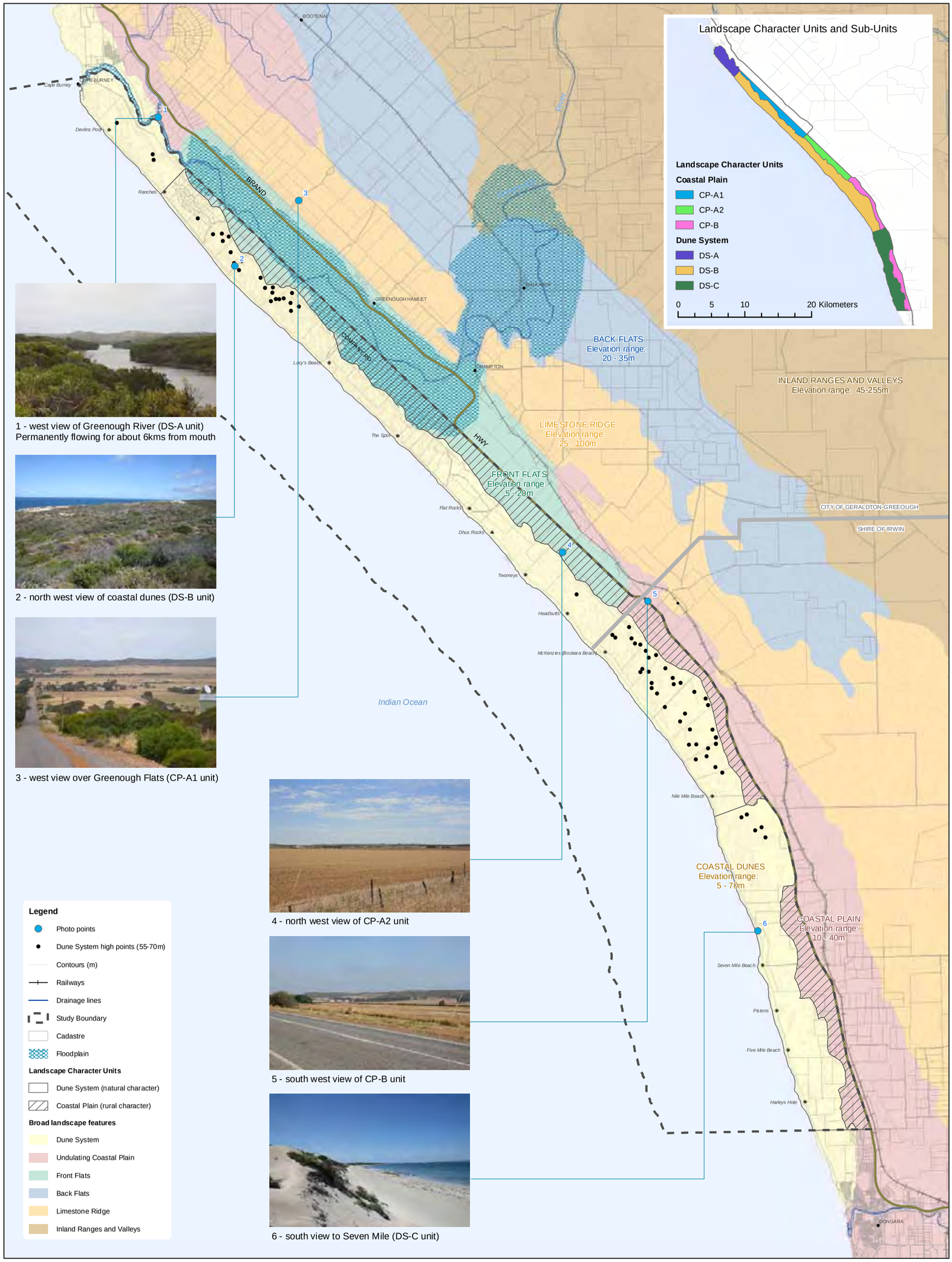
- dune system (with three sub-units)
- coastal plain (with two sub-units).

Prominent individual features within these character units comprise:

- the Greenough River, mainly where it contains open water adjacent to the dunes, elsewhere dry orange gravel and sandy bed, and steep banks are features
- coastline features - rocky promontories, reef platforms, beach rock, foredunes
- dune features - swales, ridges, hills with unusual shapes, blowouts for example, uniform cone shape.

The study area also contains a number of small features that are generally only noticeable from foreground distances. These comprise mainly cultural features such as heritage and contemporary structures. Some land use features would not likely be considered positively by the local community or tourists, as they do not relate to the historic character of the area and/or dominate their setting. While a number of these features have been documented and photographed, they were not comprehensively surveyed as this was considered beyond the requirements of this report. Small scale features include historic buildings and other structures, vegetation, prominent contemporary buildings.

**Map 5** illustrates the landscape character units and features of the study area.




1 - west view of Greenough River (DS-A unit)
Permanently flowing for about 6kms from mouth



2 - north west view of coastal dunes (DS-B unit)



3 - west view over Greenough Flats (CP-A1 unit)



4 - north west view of CP-A2 unit



5 - south west view of CP-B unit



6 - south view to Seven Mile (DS-C unit)



Map 5

*Dongara to Cape Burney Visual Landscape Assessment*

## Landscape Character Units and Landscape Features

FEB 2010

prepared for DEPARTMENT OF PLANNING

0 1 2 3 4 5 Kilometres

1:125,000 @ A3

Project No. 2349-09

# 3.0 Viewing Experience

This section documents how the landscape is viewed and valued which is related to the community's 'sense of place'. The way a landscape is perceived will differ amongst observers but general valued characteristics can be categorised from extensive desktop research undertaken by CALM (1994) and the DPI (2007). Understanding view experience is integral in the development of strategies to manage visual landscape character. An analysis of the following components was undertaken using GIS to illustrate the visual landscape:

- recreation sites and access levels
- key view locations
- viewsheds and cross-sections to determine visibility
- valued landscape characteristics

## 3.1 Visual Access and Viewing Experience

The study area is accessed according to the volume and type of public use. Factors such as road hierarchy and recreational/tourism potential are used to determine the degree of access. The access levels identified by DPI (2007) are:

- Level 1: national/state significance
- Level 2: regional significance
- Level 3: local significance

The significance level of access routes increases with (DPI, 2007):

- importance of views including type, features, rarity
- volume of use of roads, trails and navigable waterways
- degree of viewer sensitivity, e.g. tourists
- degree to which viewing the landscape is integral to the enjoyment of the travel route or site, for example a freeway is a level 1 route but the surrounding landscape may be built up urban and does not form a significant view
- duration of view, for example glimpses along roads versus long views from a significant site.

Access levels are outlined in more detail in **Appendix 4**.

The access levels within the study area are initially mapped from the desktop assessment and then confirmed in the field. **Table 2** lists the access levels within the study area.

**Table 2. Visual Access within the Study Area**

| ACCESS LEVEL | KEY LOCATION |
|---|---|
| Level 1 | Brand Highway |
| Level 2 | Company Road, sealed coastal access roads (Flat Rocks Rd, Seven Mile Rd) |
| Level 3 | Local trails and recreation sites such as Greenough Walk Trail, major and minor coastal sites, other minor routes |

The study area is primarily viewed by motorists travelling north or south on Brand Highway or Company Road. Due to the open nature of the coastal plain, especially the 'Flats', the adjoining dune system running parallel to these roads is highly visible and provides a major landscape feature for motorists to observe continuously while using these routes.

Minor roads run at right angles to the highway, providing views along the coastal plain from either the dune ridge or the limestone ridge that lies immediately east of the study area. Roads that access the coast also provide ocean views and views into the dune system.

Views from recreation areas comprise coastal views and views along the Greenough River where it adjoins the dune system, north of Company Road. Coastline and river views may also be obtained from watercraft.

Visual Access is illustrated on **Map 6**.

## 3.2 Key Views

Individual key views were identified by the DoP during site visits. Key views are those that are distinguished by being wider, more elevated than other views, or which are dominated by unusual landscape features. There are many other individual views that may be valued by locals or tourists, but those mapped are the more frequently seen, stand-out, 'key' views that frequent users of the road are more likely to recall. Ecoscape added 10 key views during site visits which mainly consisted of coastal views from 2WD access roads.

Refer to **Appendix 3** for inventory of key views.

Key views are shown on **Map 7a-c**

## 3.3 Seen Area / Viewshed Analysis

A viewshed analysis was done from 5-10 metre contour data to illustrate theoretical visibility from key view points. 5 metre contour data was available from just south of 'S Bend' to the northern boundary. The area south of S Bend was only available in 10 metre contour intervals. The viewshed model does not account for screening from vegetation or other structures. A composite viewshed was done along Brand Highway with viewpoints at 200 metre intervals (**Maps 8a-c**). A series of individual viewsheds were also done at:

- key view 8 – marks a change in the landscape for south bound motorists from very flat 'front flats' landscape to more enclosed, slightly undulating and vegetated landscape. The viewshed analysis indicates a restricted or enclosed view as a result of undulating topography (**Map 9a**)
- key view 10 – southward view of distinctive gently sloping swale enclosed by the dune which wraps around from west to south (**Map 9b**)
- key view 14 – north west view of undulating coastal plain with significant areas of remnant vegetation with the dune ridge extending inland across Brand Highway. The viewshed and skyline on **Map 9c** illustrates the variable undulating landform from this view point.

The objective of seen area analysis is to determine the potential visible area from points of interest, in this case mostly along Brand Highway. Seen area or viewshed analysis is a tool performed using a Geographic Information System (GIS) computer program, in this case, ArcGIS 9. It is a conceptual desktop method best complemented by a site visit to confirm the results of the analysis. A seen area analysis calculates the areas that are visible from an observation point using a set of user defined parameters such as height of observer (this was set to 1.6 metres), height of target (this was set to the default, i.e. the land surface height) and the extent and angle of the viewing area. The analysis uses a surface elevation derived from a digital terrain model (TIN). The output is therefore dependent on the quality

of the input surface, in this case the TIN was calculated from contour data that ranged from 5 – 10 metre intervals. Vegetation screening and built form are not considered in the seen area calculation.

The viewshed analysis indicated the extent of seen area from Brand Highway which was used to determine the skyline of the coastal dune ridge that runs parallel on the western side of the highway. The viewshed indicates that the skyline of the dune system is variable compared to the skyline of the limestone ridge located east of Brand Highway in the northern section of the study area. The skyline to the west of brand highway is similar to the ridgeline, which was identified by linking the high points on the contour surface. However the importance of identifying the skyline is to demonstrate that it will vary from the ridgeline depending on the position of the observer.

The main limitations of the viewshed analysis is that it does not account for vegetation screening and it depends on the accuracy of the contour data. However, at a regional scale it gives a good indication of the visible skyline.

Cross-sections were done for the following key views:

- Key view 2 – this is a gateway view of the 'front flats' for south bound motorists near intersection of Brand Highway and Devlin Pool Road and from West Bank Road. The cross section shows the skyline, which is the extent of the viewshed. Two cross sections were done, one from Devlin Pool Road near Brand Highway which shows the house near the skyline and one from West Band Road which shows the house on the skyline (**Map 10a**). The importance of this cross section is that it demonstrates that the skyline will vary depending on the position of the observer. It is therefore important to undertake site specific visual assessments prior to development to identify appropriate areas to site development.
- Key view 12 – south bound view of a significant part of dune face that marks the change in coastline orientation (**Map 10b – cross section 1**).
- Key view 13 –north bound view of significant part of dune face that marks the change in coastline orientation (**Map 10b – cross section 2**). These two cross sections illustrate the position of the foreground ridge and the skyline from the view points from Brand Highway.

## 3.4 Valued Characteristics

Visual quality is described in Reading the Remote, Landscape Characters of Western Australia (CALM, 1994) as "the relative visual character of a landscape, expressed as an overall visual impression or value held by society after perceiving and area of land / water." CALM (1994) identified that visual quality increases with greater:

- naturalness value
- topographic relief and ruggedness
- vegetation and landscape diversity.

The DPI (1997) identified key character indicators that can be used as a basis for classifying the landscape into two preference categories; 'most' preferred and 'least' preferred landscapes. These preference categories were established for natural, rural and built landscapes. 'Most' preferred characteristics are defined as landscape features that are highly valued by the community and contribute to the visual character (DPI, 1997). 'Least' preferred are features not valued by the community and detract from the visual character (DPI, 1997). The preference indicators for rural and natural environments (the dominant landscape characters of the study area) are summarised in the **Appendix 6**.

DoP and Ecoscape field notes were used to identify most and least preferred landscapes of the study area. **Table 3 and 4** outlines examples of most preferred and least preferred landscape features within the study area according to the DPI (2007) preference indicators.

Other smaller scale features that were not mapped include individual features such as prominent buildings, agricultural infrastructure and other small scale features and trees.

Visual Character Preferences are illustrated on **Map 7a-c**.

**Table 3. 'Most' preferred landscapes within study area**

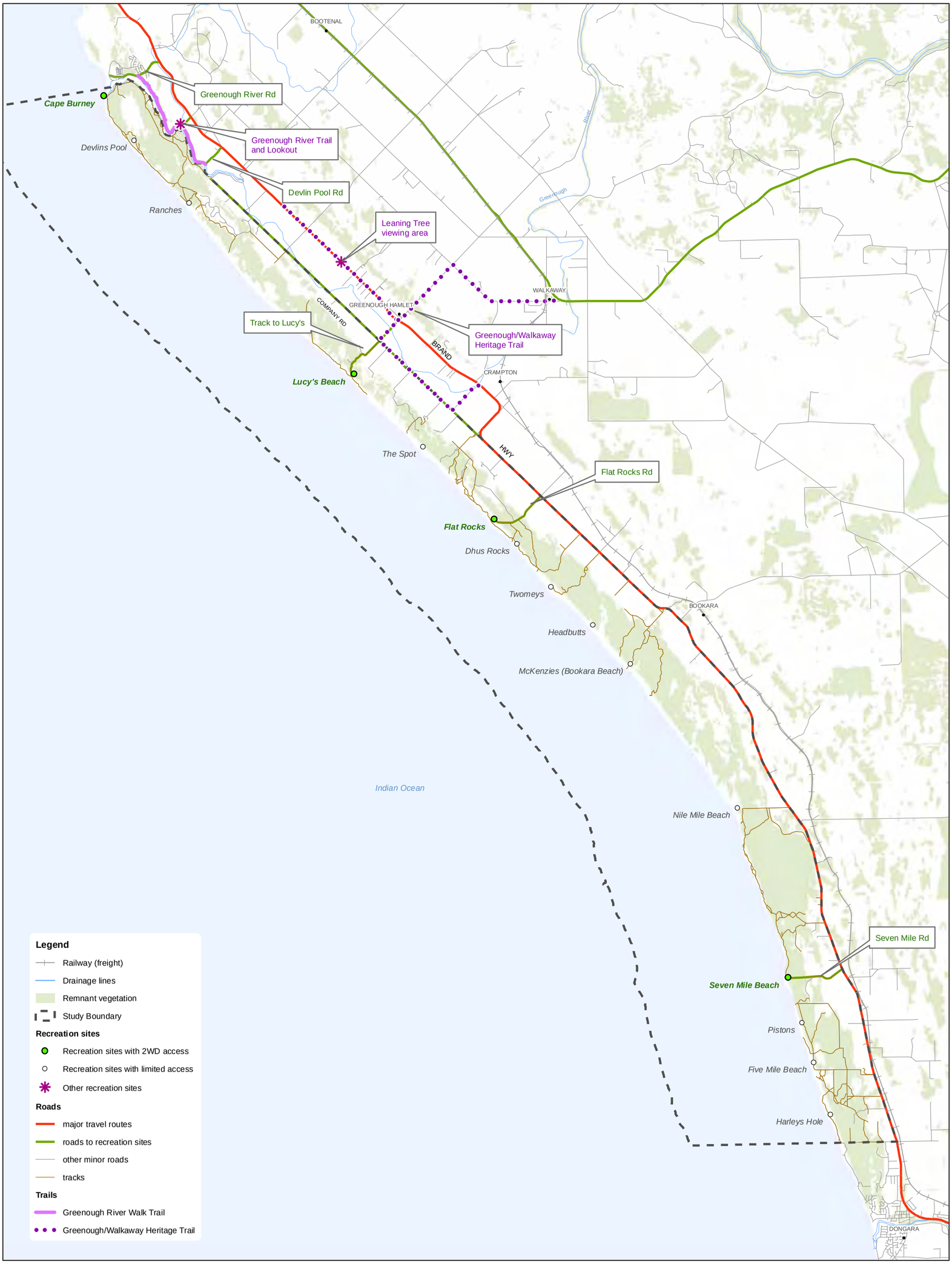
| NATURAL PREFERENCE INDICATORS (DPI, 2007) | STUDY AREA EXAMPLES | MAP REFERENCE |
|---|---|---|
| areas with high degree of naturalness | coastal dunes | Entire Dunes LCU |
| high degree of topographic variety | sections of the dunes with variable relief | 2,3,4,5,7,8,9,10 |
| vegetation diversity | vegetation diversity within the dunes*, wind-pruned vegetation | |
| outstanding combinations of landform, vegetation patterns and waterbodies in one area | northern section of the dunes which contain the river, rolling landscape and natural vegetation | 1 |
| presence of waterbodies | Greenough River | 1 |
| seascapes | coast line*. | |
| **RURAL PREFERENCE INDICATORS (DPI, 2007)** | **STUDY AREA EXAMPLES** | |
| significant/historic features | historic relics and structures+ | |
| distinctive remnant vegetation | leaning trees+ | |
| individual structures that strengthen rural character | hay bales, windmills, field bins+. | |

**Table 4. 'Least' preferred landscapes within study area**

| NATURAL PREFERENCE INDICATORS (DPI, 2007) | STUDY AREA EXAMPLES | MAP REFERENCE |
|---|---|---|
| severe weed infestations | areas of along Greenough river and some areas along the base of the dune face | 1,3,4,5 |
| soil erosion, particularly human induced | proliferation of tracks along coast causing erosion* | Along entire coastline |
| degraded waterbodies | section of the Greenough river devoid of fringing native vegetation | |
| disturbed areas | tracks going directly up the dune face | 6,8 |
| | cleared areas high up on the dune face and within the dunes. | 7 |
| **RURAL PREFERENCE INDICATORS (DPI, 2007)** | **STUDY AREA EXAMPLES** | |
| land uses that contrast from surrounding natural characteristics | buildings that dominate views due to inappropriate siting and design, for example, skylining, poor colour and material selection that does not complement the landscape+ | |
| | | 2 |

* Large scale features that cover the whole study area, such as the dune system and coastline that are not indicated on the map.

+Small individual features such as trees and buildings are not indicated on the map.




Map 6

*Dongara to Cape Burney Visual Landscape Assessment*

## Recreation Sites and Visual Access

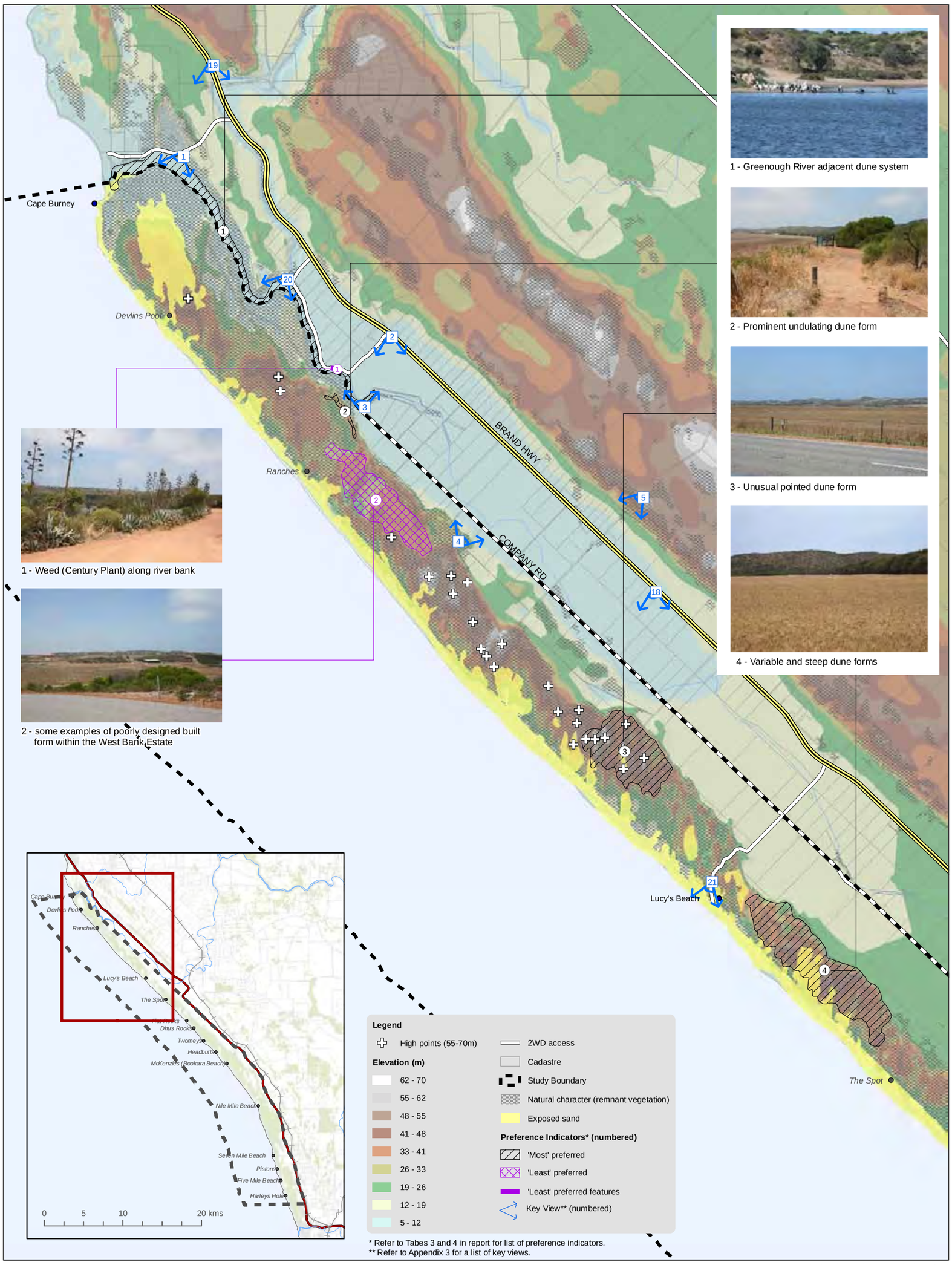
FEB 2010

prepared for DEPARTMENT OF PLANNING

0 1 2 3 4 5 Kilometres

1:125,000 @ A3

Project No. 2349-09






1 - Greenough River adjacent dune system



2 - Prominent undulating dune form



3 - Unusual pointed dune form



4 - Variable and steep dune forms



1 - Weed (Century Plant) along river bank



2 - some examples of poorly designed built form within the West Bank Estate

* Refer to Tabes 3 and 4 in report for list of preference indicators.
** Refer to Appendix 3 for a list of key views.

Note: base data supplied by DoP

Map 7a

*Dongara to Cape Burney Visual Landscape Assessment*

## Visual Character Preferences and Key Views

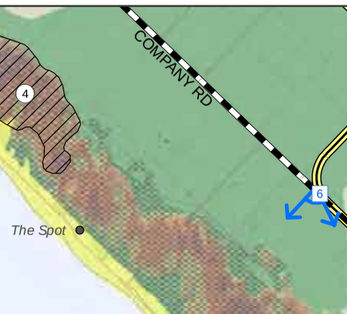
FEB 2010

prepared for DEPARTMENT OF PLANNING

0 0.5 1 1.5 2 Kilometres

1:50,000 @ A3

Project No. 2349-09



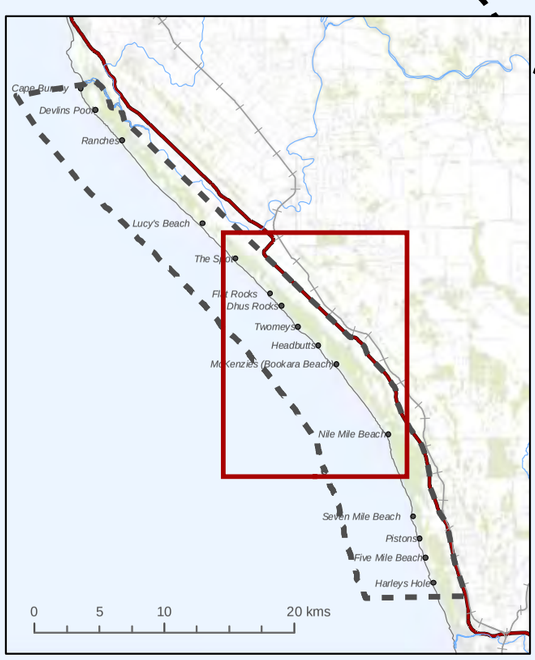
3, 4, 5 - Various weeds at base of dune, visible from Brand Hwy

7 - Cleared area up on dune face

6, 8 - Poor road design up dune face

5 - Tall steep dune face with undulating skyline

6 - Distinctive swale formation with dune enclosing the horizon




**Legend**

- High points (55-70m)

**Elevation (m)**

- 62 - 70
- 55 - 62
- 48 - 55
- 41 - 48
- 33 - 41
- 26 - 33
- 19 - 26
- 12 - 19
- 5 - 12

- 2WD access
- Study Boundary
- Cadastre
- Natural character (remnant vegetation)
- Exposed sand

**Preference Indicators* (numbered)**

- 'Most' preferred
- 'Least' preferred
- 'Least' preferred features
- Key View** (numbered)

* Refer to Tabes 3 and 4 in report for list of preference indicators.
** Refer to Appendix 3 for a list of key views.

Note: base data supplied by DoP

*Dongara to Cape Burney Visual Landscape Assessment*

# Map 7b

## Visual Character Preferences and Key Views

FEB 2010

prepared for DEPARTMENT OF PLANNING

0 0.5 1 1.5 2 Kilometres

1:50,000 @ A3

Project No. 2349-09

7 - Significant dune form, reflects change in landform orientation

8 - Undulating plain with areas of remnant vegetation
9 - Variable dune forms on the skyline

10 - Vegetated undulating landform extending across Brand Hwy

BRAND HWY

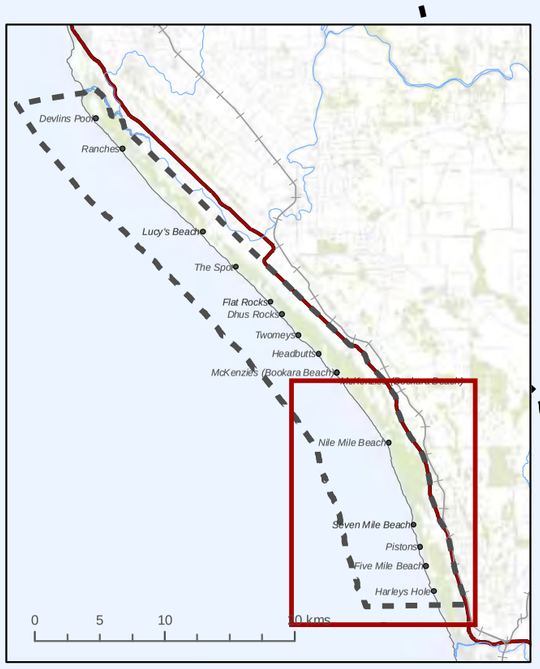
Nile Mile Beach

Seven Mile Beach

Pistons

Five Mile Beach

Harleys Hole




**Legend**

- High points (55-70m)

**Elevation (m)**

- 62 - 70
- 55 - 62
- 48 - 55
- 41 - 48
- 33 - 41
- 26 - 33
- 19 - 26
- 12 - 19
- 5 - 12

- 2WD access
- Study Boundary
- Cadastre
- Natural character (remnant vegetation)
- Exposed sand

**Preference Indicators* (numbered)**

- 'Most' preferred
- 'Least' preferred
- 'Least' preferred features
- Key View** (numbered)

* Refer to Tabes 3 and 4 in report for list of preference indicators.
** Refer to Appendix 3 for a list of key views.

Note: base data supplied by DoP

Map 7c

*Dongara to Cape Burney Visual Landscape Assessment*

## Visual Character Preferences and Key Views

FEB 2010

prepared for DEPARTMENT OF PLANNING

0 0.5 1 1.5 2 Kilometres

1:50,000 @ A3

Project No. 2349-09

ecoscape

Cape Burney

Greenough River

BRAND HWY

COMPANY RD

Lucy's Beach


**Legend**

- Contours
- Composite skyline visible from Brand Highway
- Brand Highway
- Cadastre
- Study Boundary
- Composite seen area from Brand Hwy

Base data supplied by DoP

*Dongara to Cape Burney Visual Landscape Assessment*

Map 8a

## Seen Area Analysis - composite viewshed from Brand Highway

FEB 2010

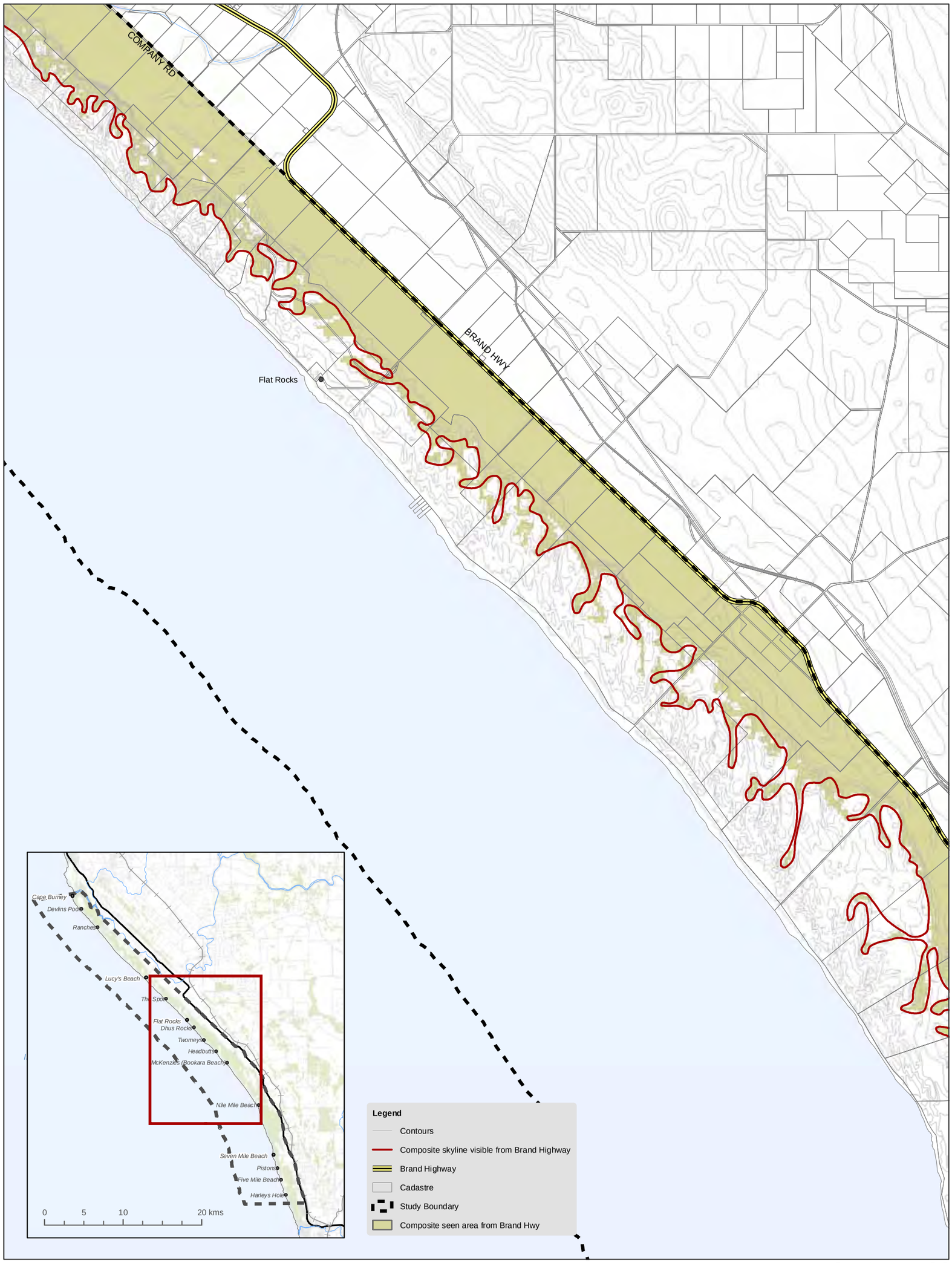
prepared for DEPARTMENT OF PLANNING

0 0.5 1 1.5 2 Kilometres

1:50,000 @ A3

Project No. 2349-09

ecoscape




Base data supplied by DoP

Map 8b

*Dongara to Cape Burney Visual Landscape Assessment*

## Seen Area Analysis - composite viewshed from Brand Highway

FEB 2010

prepared for DEPARTMENT OF PLANNING

0 0.5 1 1.5 2 Kilometres

1:50,000 @ A3

Project No. 2349-09

ecoscape

BRAND HWY

Seven Mile Beach

Cape Burney
Devlins Pool
Ranches
Lucy's Beach
The Spot
Flat Rocks
Dhus Rocks
Twomeys
Headbutts
McKenzies (Bookara Beach)
Nile Mile Beach
Seven Mile Beach
Pistons
Five Mile Beach
Harleys Hole
0 5 10 20 kms

**Legend**

- Contours
- Composite skyline visible from Brand Highway
- Brand Highway
- Cadastre
- Study Boundary
- Composite seen area from Brand Hwy

Base data supplied by DoP

*Dongara to Cape Burney Visual Landscape Assessment*

Map 8c

## Seen Area Analysis - composite viewshed from Brand Highway

FEB 2010

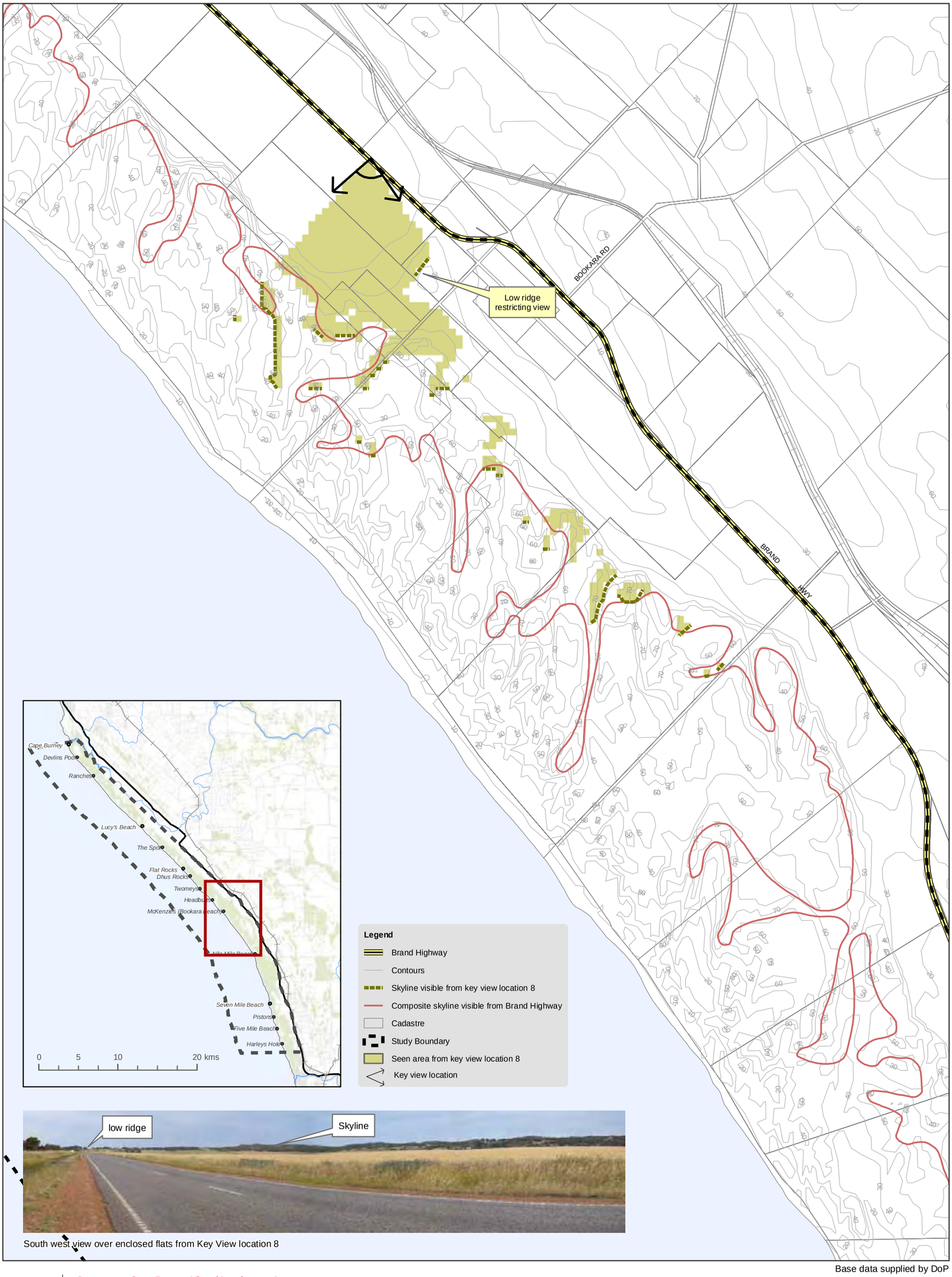
prepared for DEPARTMENT OF PLANNING

0 0.5 1 1.5 2 Kilometres

1:50,000 @ A3

Project No. 2349-09

ecoscape







South west view over enclosed flats from Key View location 8

Base data supplied by DoP

Map 9a

FEB 2010

*Dongara to Cape Burney Visual Landscape Assessment*

## Seen Area Analysis - Key View Location 8

prepared for DEPARTMENT OF PLANNING

0 0.2 0.4 0.6 0.8 1 Kilometres

1:25,000 @ A3

Project No. 2349-09

ecoscape

BOOKARA RD

BRAND HWY


**Legend**

- Brand Highway
- Contours
- Skyline visible from key view location 10
- Composite skyline visible from Brand Highway
- Cadastre
- Seen area from key view location 10
- Study Boundary
- Key view location


South west view over gently sloping swale from Key View location 10

Base data supplied by DoP

*Dongara to Cape Burney Visual Landscape Assessment*

Map 9b

## Seen Area Analysis - Key View Location 10

FEB 2010

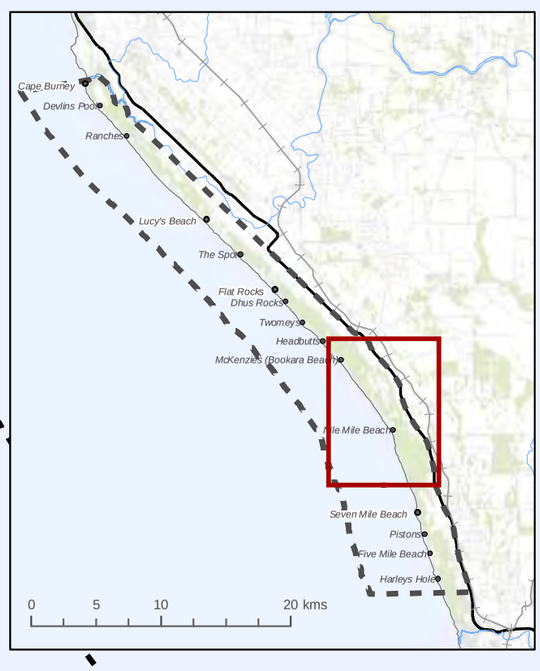
prepared for DEPARTMENT OF PLANNING

0 0.2 0.4 0.6 0.8 1 Kilometres

1:25,000 @ A3

Project No. 2349-09

North West view from Key View 14 over an undulating and vegetated coastal plain




**Legend**

- Brand Highway
- Contours
- Composite skyline visible from Brand Highway
- Skyline from key view 14
- Cadastre
- Study Boundary
- Seen area from key view location 14
- Key View

Base data supplied by DoP

Map 9c

FEB 2010

*Dongara to Cape Burney Visual Landscape Assessment*

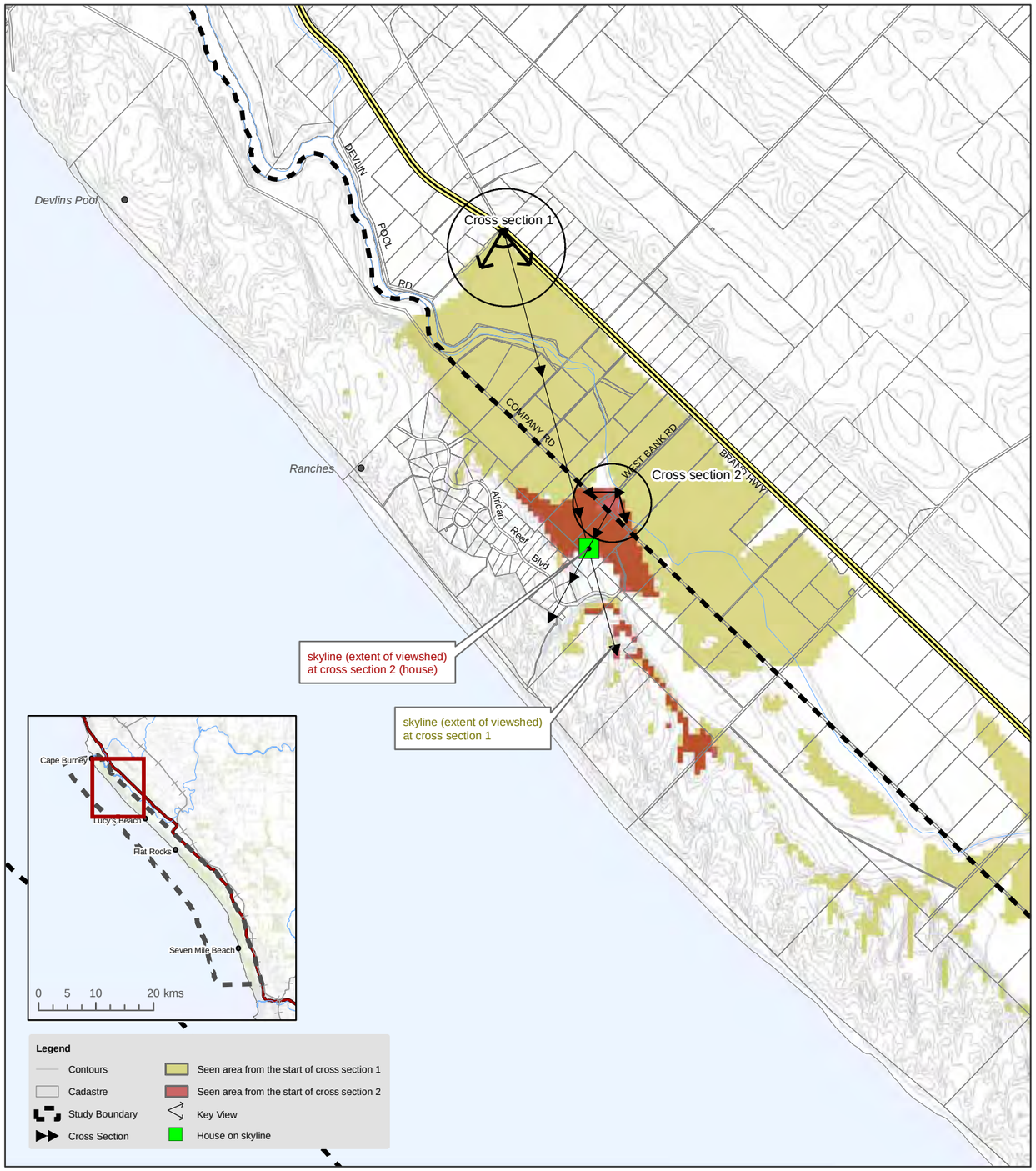
## Seen Area Analysis - Key View location 14

prepared for DEPARTMENT OF PLANNING

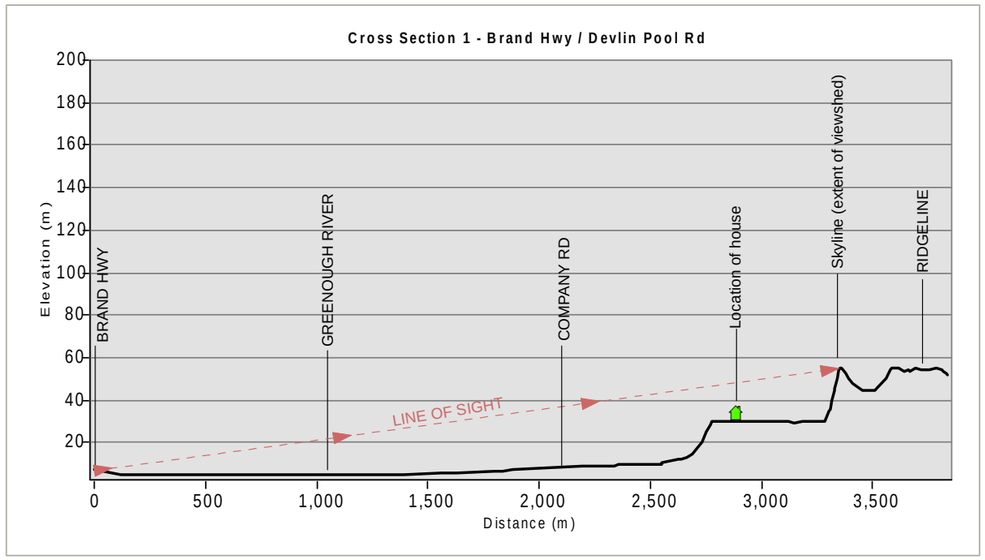
0 0.2 0.4 0.6 0.8 1 Kilometres

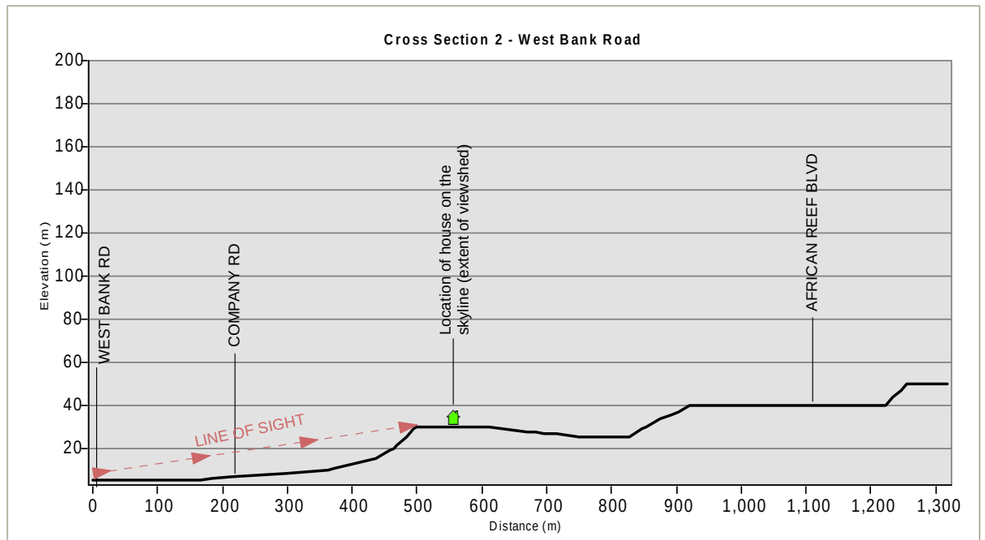
1:30,000 @ A3

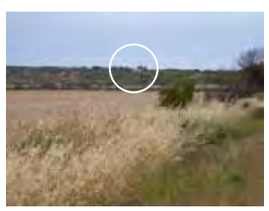
Project No. 2349-09



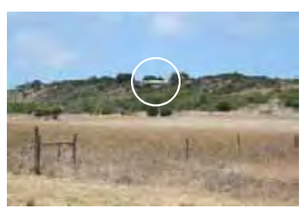

Base data supplied by DoP



South-south east view from cross-section 1 towards house on dune



Closer SW view from cross-section 2 of the same house on dune which is skylining

*Dongara to Cape Burney Visual Landscape Assessment*

Map 10a

## Key View 2 - Seen Area & Cross Section Analysis

FEB 2010

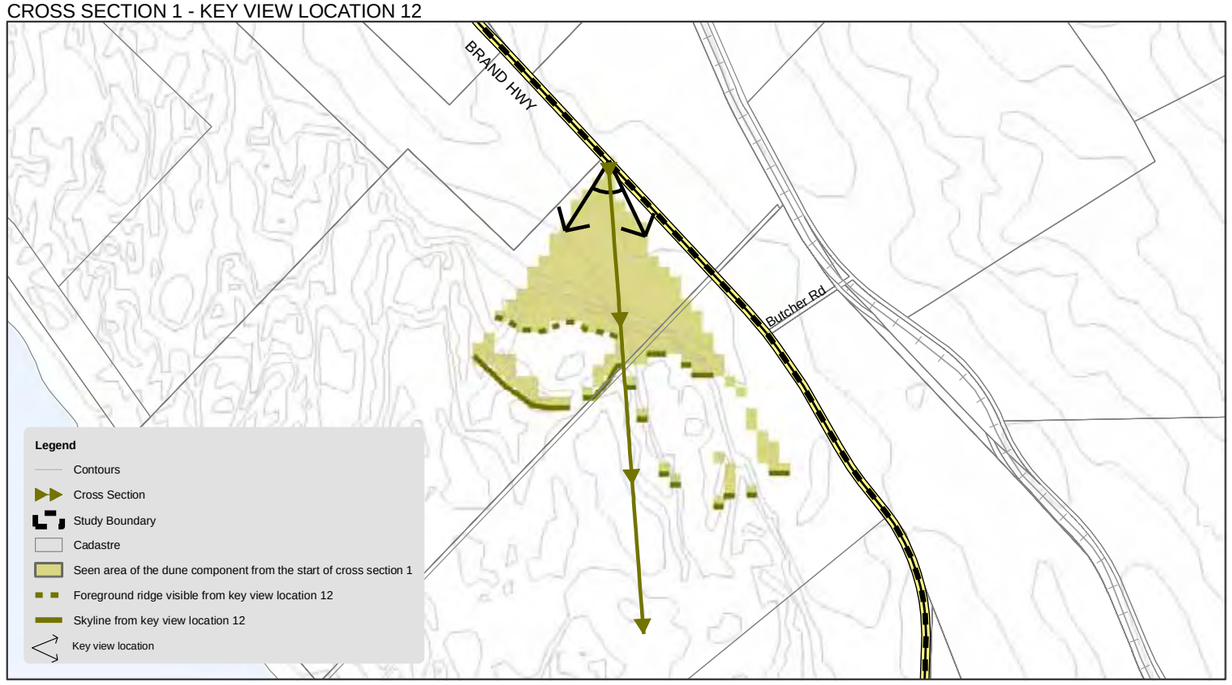
prepared for DEPARTMENT OF PLANNING

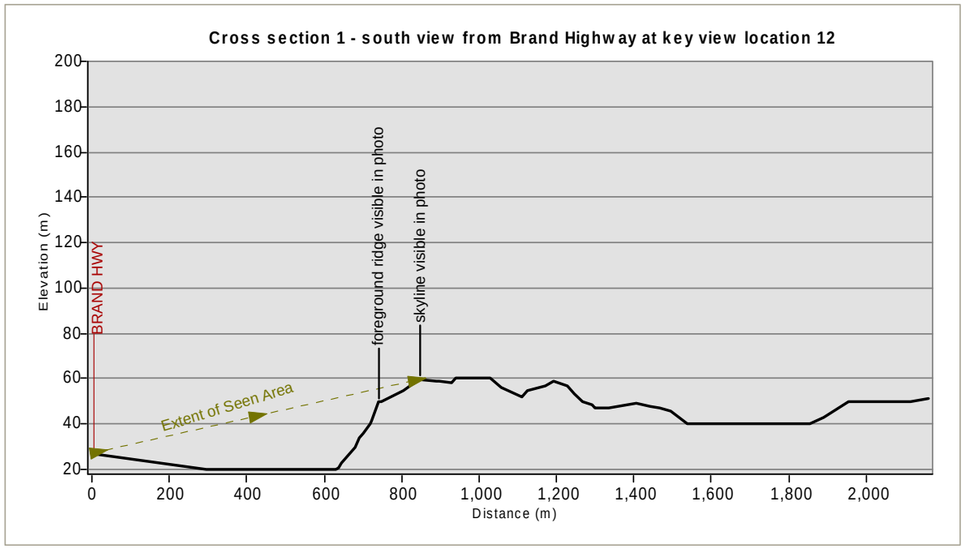
0 0.5 1 1.5 2 Kilometres

1:40,000 @ A3

Project No. 2349-09

CROSS SECTION 1 - KEY VIEW LOCATION 12

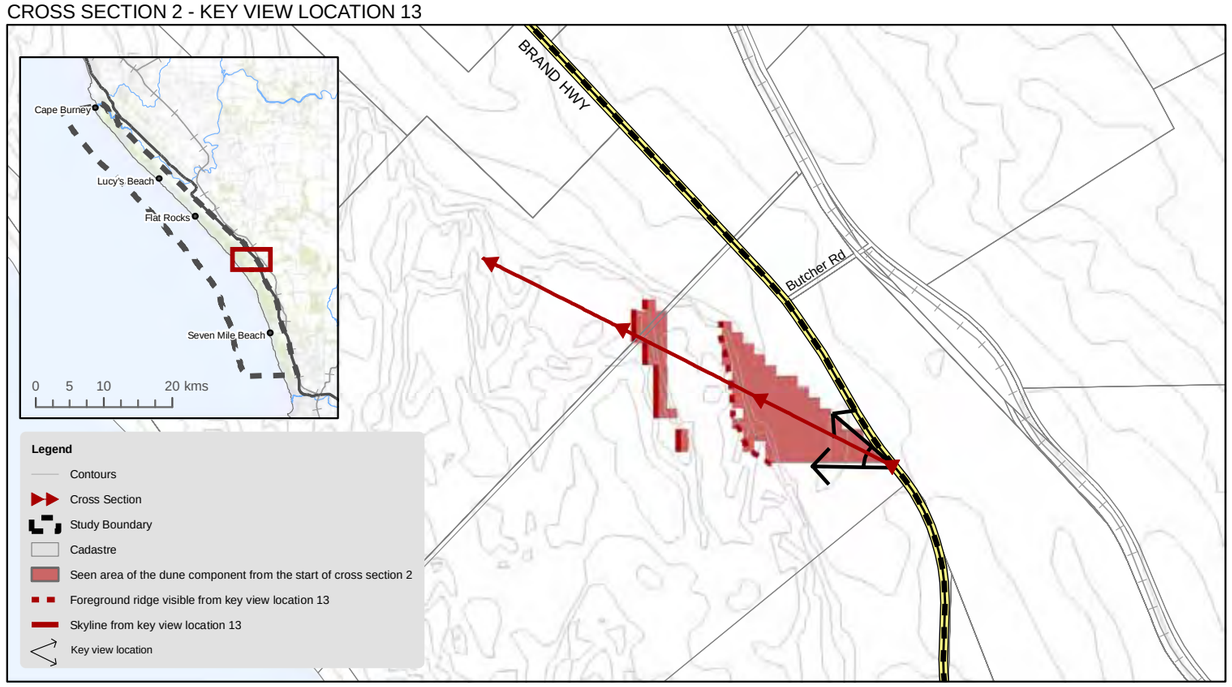


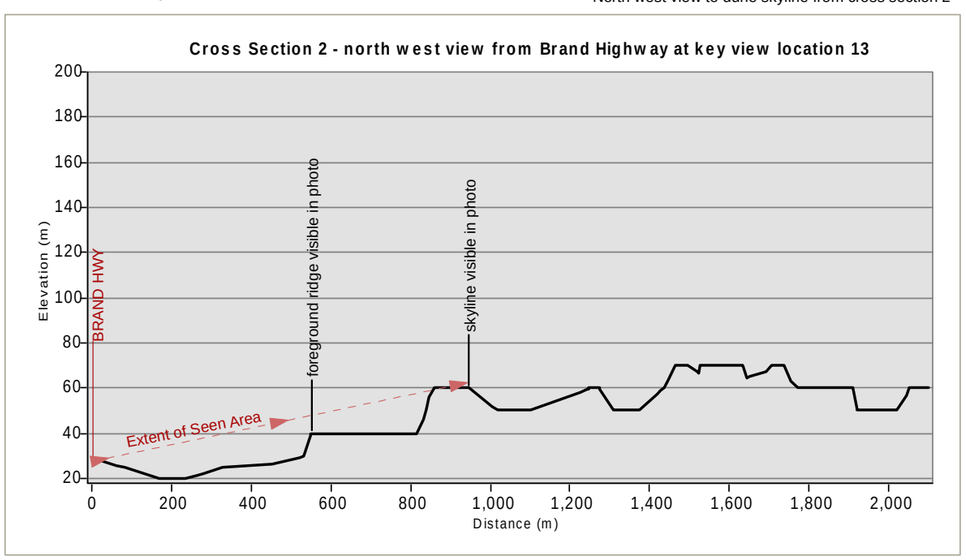




South view to dune skyline from cross section 1

North west view to dune skyline from cross section 2

CROSS SECTION 2 - KEY VIEW LOCATION 13




Base data supplied by DoP

Map 10b

FEB 2010

*Dongara to Cape Burney Visual Landscape Assessment*

## Key View 12 and 13 (Bookara) - Seen Area & Cross Section Analysis

prepared for DEPARTMENT OF PLANNING

0 0.25 0.5 0.75 1 Kilometres

1:25,000 @ A3

Project No. 2349-09

ecoscape

# 4.0 Key findings for Managing Landscape Character

Key findings for managing landscape character have been developed through the evaluation and mapping of Landscape Character Units, Landscape Preference indicators, key views, viewsheds and cross-section analysis. In addition, the visual management objectives adopted by the DPI (2007) to manage landscape character have been considered, these include:

i. best practice siting and design; which should be the baseline objective for the whole study area

ii. protection and maintenance

iii. restoration of degraded character or enhancement of opportunities

To achieve these broad objectives, specific objectives through design guidelines have been identified (DPI, 2007):

a. not evident: development not to be visible from key viewing locations

b. blending: development may be evident but not prominent by blending in with the surrounding landscape

c. prominent: development may be a dominant feature in the landscape

## 4.1 Key findings for Visual Management

The following text describes the proposed key findings for:

- Landscape Character units
- Landscape Features
- Views

**DUNE SYSTEM**

A. Bordered by Greenough River (DS-A)

Retain natural character with no development evident other than low-key recreation facilities such as walk trails or boat access ramps. The broad key findings for this unit are:

- Protection and maintenance of the natural character
- Restoration and enhancement along river trail including closure of unnecessary tracks, weed removal and improved signage and shelters.

B. West Bank Estate to Nine Mile Beach (DS-B)

Retain natural character where it currently exists and reduce the visibility and potential visibility of recreation, tourism or other development nodes by containing their visibility to within their immediate viewshed and by retaining or re-introducing local native vegetation. It is preferable that, no further development to be visible on the dune face that forms the backdrop to the coastal plain. The broad key findings for this unit are:

- Protection and maintenance of the natural character
- Restoration and enhancement of coastal areas including improving facilities at coastal nodes and rationalising tracks which are contributing to coastal erosion. Other areas for restoration include tracks that go directly up the dune face which are visible from Brand Highway and the West Bank Estate to improve the visual quality of

this area and help it blend with the surrounding landscape.

i. West Bank Estate

Ideally measures would be taken to improve the visual amenity of the West Bank Estate. Some of the existing buildings may be visible from beyond the dune system, for example from viewpoints on the limestone ridge east of the 'Flats'. Future buildings and infrastructure such as power poles should not be visible from outside the estate. Buidling envelopes within the estate control the location future buildings however visual mangement strategies for future development will still need to be considered. Within the estate, planting local native vegetation within road reserves would assist in blending the estate with its setting. Prominent non-local species such as Norfolk Island pines would be visually inappropriate as they would alter the natural character.

ii. Lucy's Beach and Flat Rocks Beach (Coastal Nodes)

Contain the visibility of any future development at Lucy's Beach and Flat Rocks Beach to the immediate vicinity of these nodes. However, it would be acceptable for infrastructure related to marine safety, such as lookout or telecommunications towers, to be visible from a distance along the coastline. A site plan has been prepared by Ecoscape to indicate the potential development which would be acceptable at Lucy's (Appendix 6).

iii. Red Emperor Drive

This study would advise it is preferable that any future development here should not be visible from beyond the immediate vicinity, preferably not from Flat Rocks Road as well as more distant viewpoints. There is an approved subdivision along Red Emperor Ave - Red Emperor Drive, of approximately 8 lots, 100m from high water mark, where the dunes are more likely to be stable. There is one formal beach access track, other access being informal.

iv. Bookara vacinity

If development occurs here in the future it would need to comply with the broad management objective above. Given the visual sensitivity of the site as viewed from the Brand Highway (see key views 12 and 13), particular attention would need to be given to reducing visibility of development from the Brand Highway, for example by use of terrain cross-sections along the alignment of key view directions (i.e. views at an acute angle towards the site as opposed to cross-sections taken at right angles to the highway).

C. Nine Mile Beach to Dongara (DS-C)

Portions of this sub-unit have already been cleared for pasture so the degree of naturalness is not as high as other sub-units. Nevertheless, as for the sub-unit immediately to the north, the objective would be to retain natural character where it currently exists and reduce the visibility and potential visibility of any recreation, tourism or residential nodes by containing their visibility to within their immediate viewshed and by retaining or re-introducing local native vegetation. Further, given that the dune system is predominantly natural in character, it would be preferable if the rural elements were contained to the existing footprint rather than be extended further throughout the dunes. The broad key findings for this unit are:

- Protection and maintenance of the natural character
- Restoration and enhancement of coastal areas including improving facilities at coastal nodes and rationalising tracks which are contributing to coastal erosion.

i. Seven Mile Beach (Coastal Node)

Contain the visibility of any future development at Seven Mile Beach. However, it would be acceptable for infrastructure related to marine safety, such as lookout or telecommunications towers, to be visible from a distance along the coastline. A site plan has been prepared by Ecoscape to indicate the potential development which would be acceptable at Seven Mile (Appendix 6).

## COASTAL PLAIN

A. Greenough 'Front' Flats (CP-A)

Retain rural and heritage character. Any tourism, commercial or residential development to be located and designed in such a way as to maintain the general rural character and retain the prominence of heritage structures and the integrity of their settings. The broad key findings for this unit are:

- protection and maintenance of key views and heritage character at key locations
- best practice siting and design for most of the coastal plain
- restoration and enhancement of degraded landscapes including the banks of the Greenough River which are devoid of native vegetation and areas of weed infestation.

i. Greenough Flats adjacent to river (CP-A1)

While all of the Flats is rural in character, the portion of the Greenough Flats adjacent to the Greenough River has a higher lot density, a result of historic land use, than the southern section and has more houses visible from public roads. The study area is isolated from the Brand Highway by the river, and Company Road forms the main access road to this sub-unit.

These factors suggest that this sub-unit could support a degree of further development without compromising its current character. However there are a number of significant heritage structures both within this sub-unit and immediately to its east, including the National Trust's Greenough Hamlet. Particular care needs to be taken to retain their significance in the landscape, by buffering them from future development and by protecting landscape features associated with the structures, for example, heritage plantings including exotics such as palms, driveways, field size and configuration. New development needs to blend with these heritage structures, not by replicating them, but by utilising some of their elements, for example, limestone for wall materials, and by not attracting attention by locating buildings with eye-catching design where they will draw attention from the heritage structures.

The banks of the Greenough River are devoid of vegetation. Rehabilitation by planting with local riverine native species, including tree species, would assist in restoring the visual dominance of this important landscape feature.

ii. Greenough Flats south of river (CP-A2)

This sub-unit displays a simple, less varied and more exposed character than either the Flats to the north, or the undulating coastal plain to the south. As it lies immediately adjacent to the Brand Highway, as opposed to the northern part of the Flats, it is visible to more people, including tourists, and is therefore considered more visually sensitive. The preferable objective for this sub-unit could be to retain its open, simple, rural character, so the dune face remains the dominant landscape feature with minimal detail in the foreground that detracts from the dune. To alter the landscape character by allowing smaller lots would require more planting to screen development. This would result in screening the dune face from continuous view from the highway.

B. Wakeford Road to Dongara (CP-B)

The more varied, undulating and partly vegetated character of this section of the coastal plain results in a landscape that has greater visual absorbance capacity. Screening by new roadside planting would be acceptable in parts of this unit, as the dune face is already not visible from sections of the Brand Highway through this sub-unit. The broad key findings for this unit are:

- protection and maintenance of rural character and prominent landforms at key locations
- best practice siting and design for most of the coastal plain
- restoration and enhancement of degraded landscapes.

i. Bookara vacinity

The Bookara vacinity has two components: a section in the dune system, discussed previously; and a portion on the adjoining coastal plain. Based on the identification of individual landscape features and key views, it is concluded that this part of the coastal plain is particularly visually sensitive. It is located in the foreground of key views from Brand Highway, focused on the profile of the dune face where the dune system changes direction. Development would require consideration of key views and landscape features.

### LANDSCAPE FEATURES

There is a need for a comprehensive survey that identifies all medium and small scale landscape features within the study area, both those that the community is likely to value highly, and those that would be considered as detracting from the rural/heritage/natural character of the study area.

Key findings for visual management should focus on protecting valued features, including but not limited to those described and mapped, and on avoiding or addressing those features that are likely to be viewed negatively, such as prominent contemporary buildings that dominate views and do not blend with the surrounding landscape.

Measures to protect valued features would include not developing them for new uses, removing discordant elements such as weeds or earth piles left over from completed roadworks, or buffering new development sufficiently to ensure that the valued features remain visually dominant in the landscape.

Means to address features, or specific components of features, that the community and tourists probably consider negatively include their removal where feasible, alteration of specific elements, or screening these features from view from major travel routes or recreation sites.

However, any screen planting should be undertaken in such a way that valued key views are not screened. Avoiding approval of features that alter preferred valued landscape character is the ideal long-term strategy to maintain valued features and overall character.

### VIEWS

Viewing experiences

The principal key findings in relation to the view experiences provided within the study area is to retain, and where possible to enhance, the experience of travelling along Brand Highway and being able to view the dune face in a continuous manner as a natural feature that dominates the landscape. Secondary to this is maintaining and enhancing the visibility of features of heritage character, either located adjacent to roads or along the base of the dune face.

Enjoyment of the general viewing experience could be enhanced by creating opportunities to see more of its features, for example, pullover bays adjacent to roadside heritage structures, similar to the one provided near an example of a 'leaning tree'. Another strategy may be the publication of maps and brochures or an 'interactive trail' that interpret the landscape, designed to be used by motorists.

Individual key views

Views that have been mapped require protection of their valued characteristics. The text below comprises key findings that relate to categories of key views that are available in the study area.

Where a view is important because it focuses on an individual landscape feature, such as the dune face seen in profile at Bookara, (**views 12, 13**) this feature should not be screened from the identified viewpoint and new structures should not be located or designed in such as way that they would draw attention from the feature. This would also apply to views of features mapped and listed as features rather than key views.

Key views may feature a low dune ridge that extends from the dune system across directly in front of the viewer (**views 8, 10, 14, 15**). In these cases it may be beneficial to ensure that the slope facing viewers retains its current natural/rural character. New development should be minimal and at the least, buildings should not protrude above the skyline as viewed from designated points on the road. Major firebreaks, access drives and other linear features should not be orientated towards the key view direction.

Views from recreation sites, such as views along the lower reaches of the Greenough River (**views 1 and 3**), may be enhanced by tidying up the view sites, for example, removing earth piles and weeds, planting shade trees that will provide a canopy or frame the view, or constructing seating.

Panoramic views from within the coastal plain landscape character unit (**views 9, 10, 11, 17**) are generally seen from positions that are only slightly elevated above the landscape (other than views from within the dune system). This means that it would be easy to screen these views by buildings or vegetation, either on purpose (to screen features considered to be negative) or inadvertently. The open character of these views should be maintained, by avoiding roadside screening.

Elevated panoramic views across the coastal plain from the roads to the coast though the dune system (**views 4, 7, 16**), or from the limestone ridge inland of the study area (**view 5**), may be better appreciated if pullover bays were provided. These may be locations for interpretive signage regarding landscape character.

Several views on the coastal plain are important mainly because of the 'gateway', entrance or orientation function that they provide (**views 2, 6, 9, 17**). There may be ways in which this function could be signalled or enhanced. The sensitivity of land located in the foreground of these views should be reflected in land uses that are approved there, and these views should not be screened.

**Map 11** illustrates the visual management objectives for the study area.


Base data supplied by DoP

Map 11

*Dongara to Cape Burney Visual Landscape Assessment*

## Visual Management Objectives

FEB 2010

prepared for DEPARTMENT OF PLANNING

0 1 2 3 4 5 Kilometres

1:125,000 @ A3

Project No. 2349-09

ecoscape

## 4.2 Design Opportunities

Each Landscape Character Unit (LCU) has unique qualities that inform the design response. This is to ensure future developments contribute to the local character. An understanding of the visual elements of the landscape is important to inform the design response. The position of the observer in the landscape affects their perception of visual factors such as form, colour, texture, materials. This evaluation results in the identification of the most appropriate design guidelines, which are discussed in **Section 4.3**.

The quality of the reflected light off a surface affects the texture and colour. The harsh, bright quality of the sun on the Western Australian coastline and adjacent areas gives this area a unique look and feel. A distinguishing quality of the colours of the Coastal Plain LCU and to a lesser extent, the Dune System LCU's, is the de-saturation, ie a 'washed-out' look, especially in summer. The bright sunlight though can also brighten the deeper colours, adding richness to the character. Ratio of different colours and tones is important. Brighter, richer and deeper colours can be used, but should not overpower the subtler colours.

Textures are about the appearance and/or feel of a surface, and the quality of the various elements and how they relate to each other. The appearances of textures are dependent on the viewer's location and perception. The closer the observer is, the finer the detail and texture. When viewed from a greater distance, finer textures become blurred and are lost and the size, shape and arrangement of the elements becomes the dominant visual characteristic, i.e. form and line.

Form is distinguished from colours, textures or materials, and is solely the external appearance of an area. It is the placement, structure and pattern of elements. Placement of objects within a landscape is important as the style of arrangement of elements within a particular landform will affect whether a landscape has a disparate or a harmonious look. For the study area, a harmonious appearance is desirable so as to maintain and enhance the unique natural features of the landscape.

### DUNE SYSTEM

Inspiration for design opportunities in the Dune System is taken mainly from the natural landscape. The character of the dune system LCU is revealed through the coastline, the dominant north-south dunes and the vegetation. Built form is minimal and visually disjointed at tourist nodes.

Colour

The colours of the dune system LCU are taken solely from the coastline, native vegetation and dunes. These elements include the following:

- ocean
- sand dune substrate (sand)
- dune vegetation
- different qualities and strength of the light on dune forms
- trees.

The colours in this selection are predominantly cool, bright and pale blues, greys and yellows of the ocean and sand dunes; cool, pale and deep greens and yellows of the dune vegetation foliage; some warmer, deep shades of red of dune succulent vegetation and riverine samphires; cool, dark grays of *Acacia rostellifera* branches and *Melaleuca lanceolata* trunks; and cool and warm olive greens of heath vegetation.

This is an example of the process of colour selection, where natural (and built elements if available) are chosen from the landscape, (see Figures 2 and 3) and from which colours are then selected to make the swatches (see Figures 4 and 5).

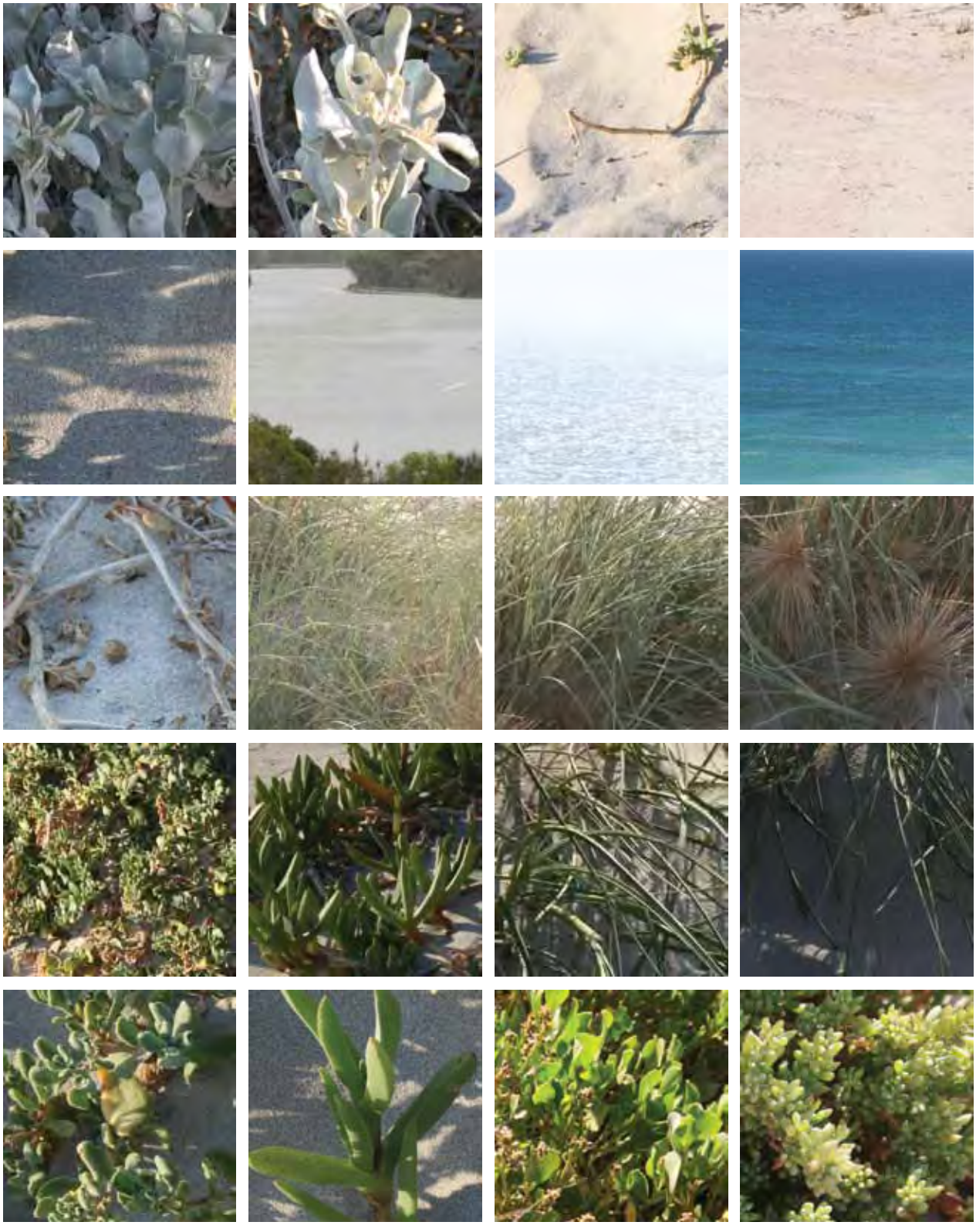


**Figure 2. Dune system colour palette (1)**

**Figure 3. Dune system colour palette (2)**

**Figure 4. Dune system colour swatches (1)**

**Figure 5. Dune system colour swatches (2)**

Texture

As with the Coastal Plain LCU, the textures of the Dune System LCU are taken from similar elements as the colours, but the focus is on the detailed surface appearance and the relation of elements seen from a distance. Inspiration is taken from the following:

- sand dune substrate (sand)
- dune vegetation
- trees
- Greenough River
- rocks at ocean edge
- broad expanses or bare areas of vegetation on undulating, interwoven landform.

The textures in this selection range from the details of the vegetation as seen in the foreground such as the delicate, regular, linear sand ripples; slender, threadlike dune spinifex; thicker, succulent vegetation; rough, knotty tree trunks; spindly bushes. The vegetation form in the middle distance appears soft and rounded and is interspersed at Cape Burney with the flat, open, weaving river surface.

**Figure 6. Dune system texture palette (1)**

**Figure 7. Dune system texture palette (2)**

Materials

There is a limited amount of material within the Dune System LCU which does not appear visually disjointed in this landscape. Most of the materials used in the built form are not consistent with and do not enhance or reflect the local character. These include the following:

- toilet block, beach shelter and lookout gazebo at Cape Burney
- all facilities at Flat Rocks (excluding the timber deck) including the toilet block, ramps and handrails, vehicle barriers and signage
- table and benches at Seven Mile Beach.

Materials which can be used in future built form include:

- limestone
- corrugated iron
- timber.

A materials palette (Figure 8) is included on the following page to illustrate the disparate materials found in the Dune System LCU, whereas the intent of the colour, texture and form palettes is to present design opportunites to be drawn upon.

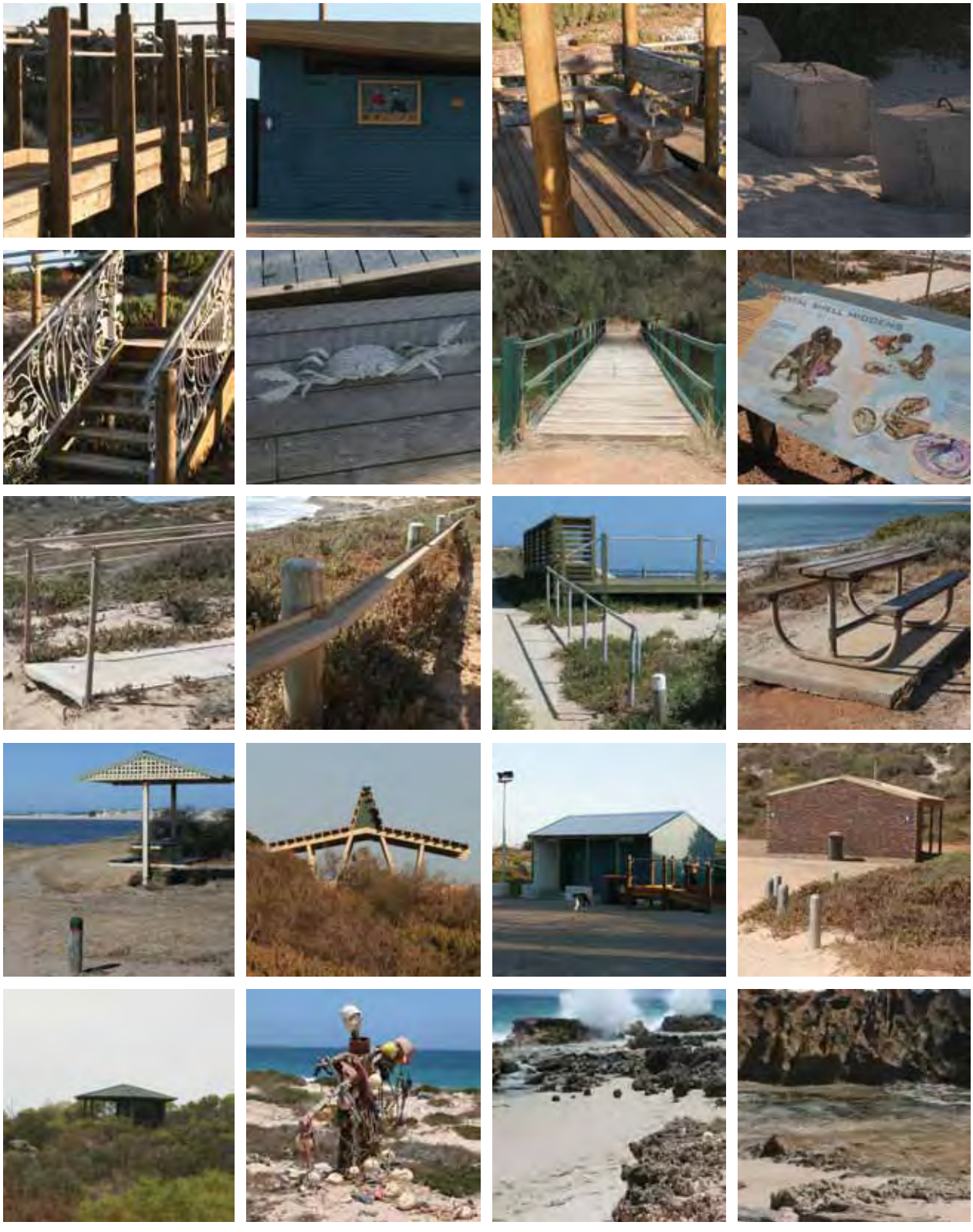


**Figure 8. Dune system materials palette**

Form

The forms of the Dune System LCU are taken predominantly from the landscape, these include the following:

- gentle undulating landform
- deeper valleys and higher peaks of dune forms
- interwoven, folding landform
- curved, expansive beaches
- weaving, flat river through undulating hills
- prominent peaks and ridges of the dunes which jut out over the Coastal Plain
- the dune ridgeline as seen from Brand Highway.

There are minimal vertical forms in the Dune System LCU, sparse trees but masses of heath vegetation. The dune face seen from Brand Highway is accentuated by having the planar, linear form of the Coastal Plain abutting it. As mentioned in the Coastal Plain form notes, the dunes frame the Coastal Plain and together they form a unique landscape, more dramatic than if each of the landforms were located in isolation.

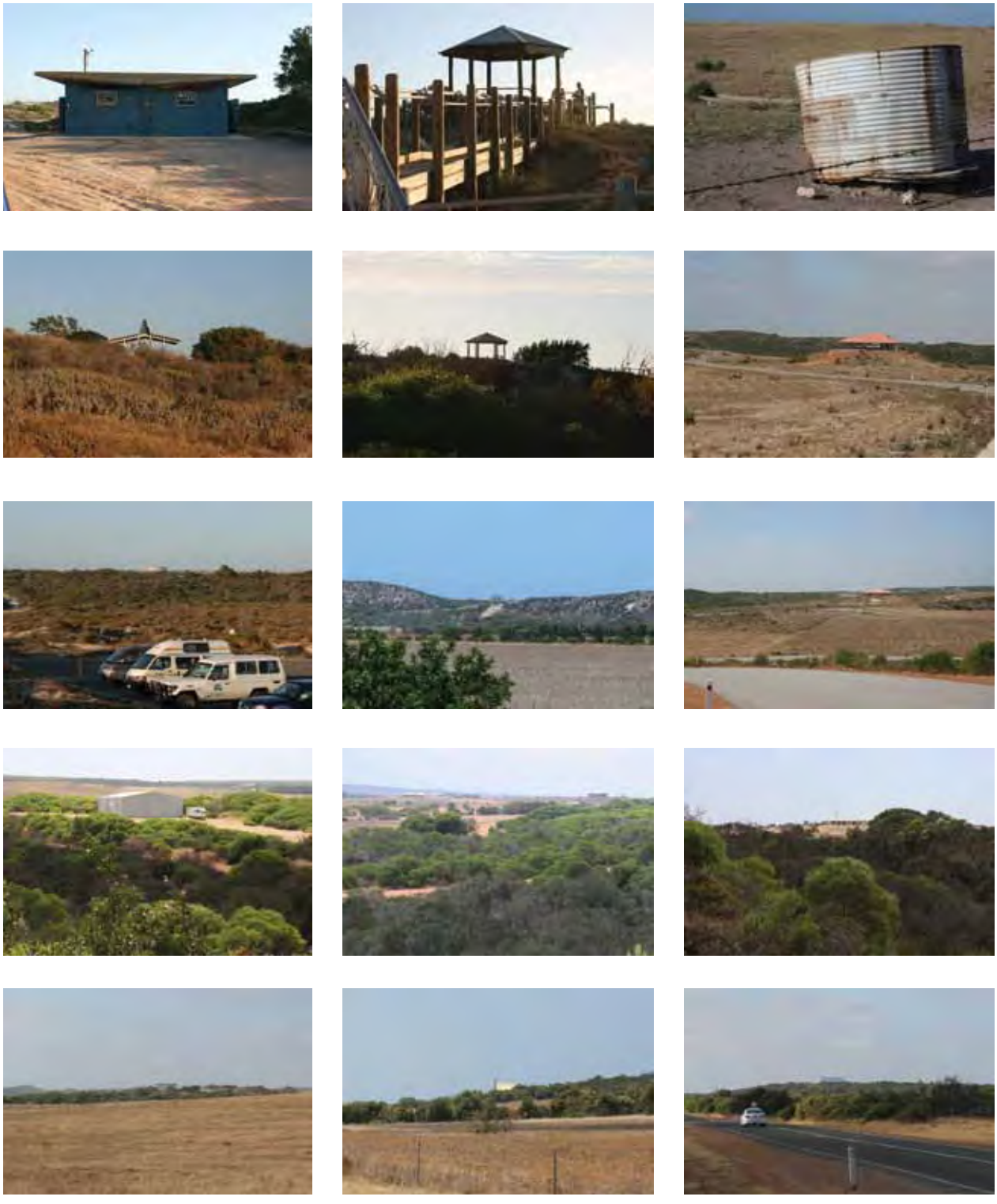


**Figure 9. Dune system form palette (1)**

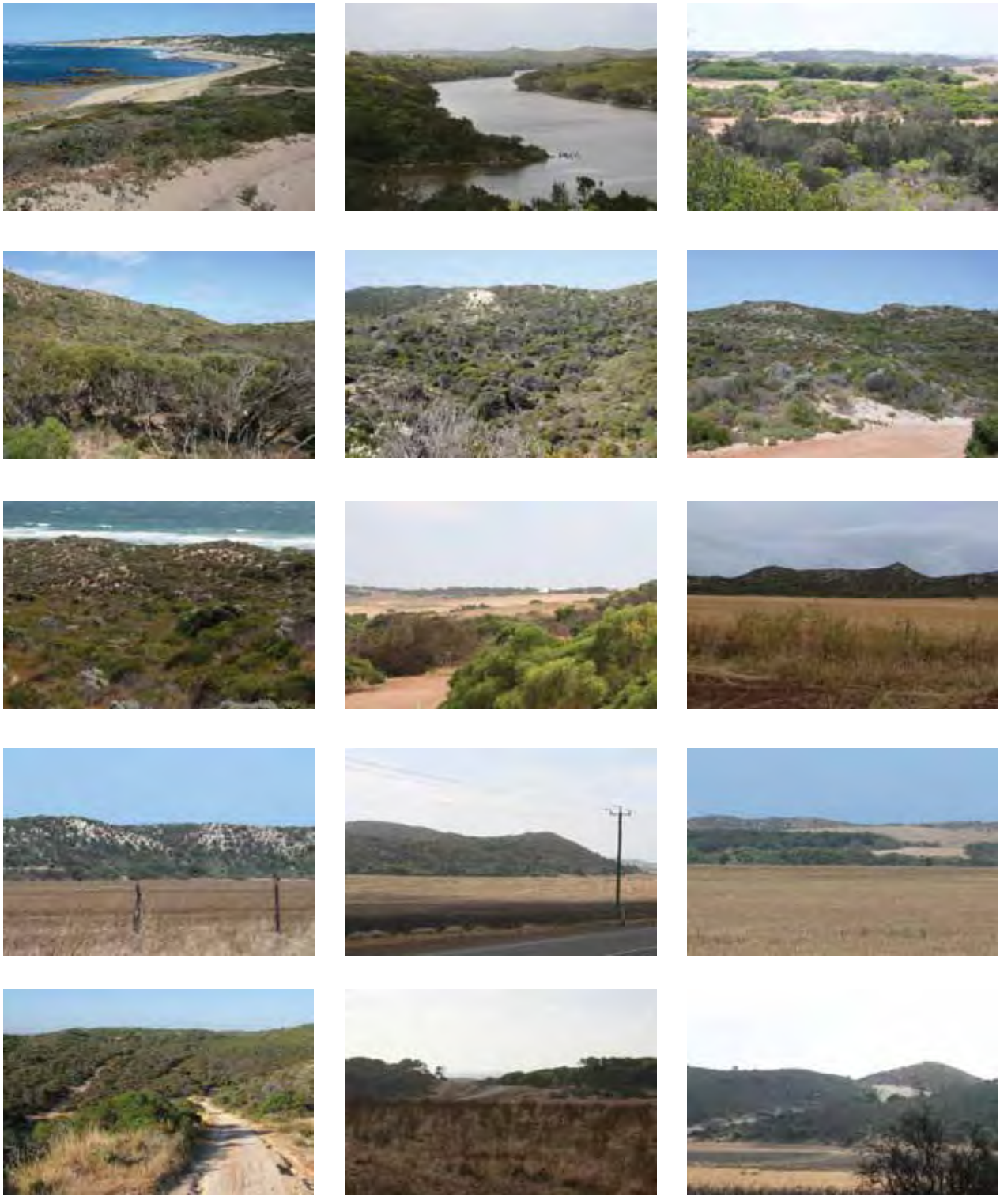


**Figure 10. Dune system form palette (2)**

## COASTAL PLAIN

The elements of the Coastal Plain landscape present an abundance of opportunities from which to take design inspiration. The character of this LCU is evident through a rich tapestry of elements including numerous ruined and preserved historic buildings, the predominant, distinct horizontal linear patterning of the agricultural flats with a dune backdrop, plus scattered remnant vegetation. The visual elements of the landscape, i.e. colour, texture, materials and form have been derived from the following features within the study area:

- heritage built form at the Greenough Hamlet
- a number of ruined historic buildings / bridge foundations (Maley's Bridge), walls
- rural elements such as agricultural infrastructure
- the agricultural landscape
- natural vegetation such as individual leaning trees, remnant groves of woodland vegetation, coastal shrublands.

Colour

The colours in this selection are predominantly warm, deep reds and oranges of the historic built form; warm, pale yellows from the limestone and summer agricultural landscape; warm reds and greys of trees and built timber elements; and deep and pale olive greens of the remnant vegetation.

This is an example of the process of colour selection, where natural and built elements are chosen from the landscape, (Figures 11 and 12) and from which colours are then selected to make the swatches (Figures 13 and 14).

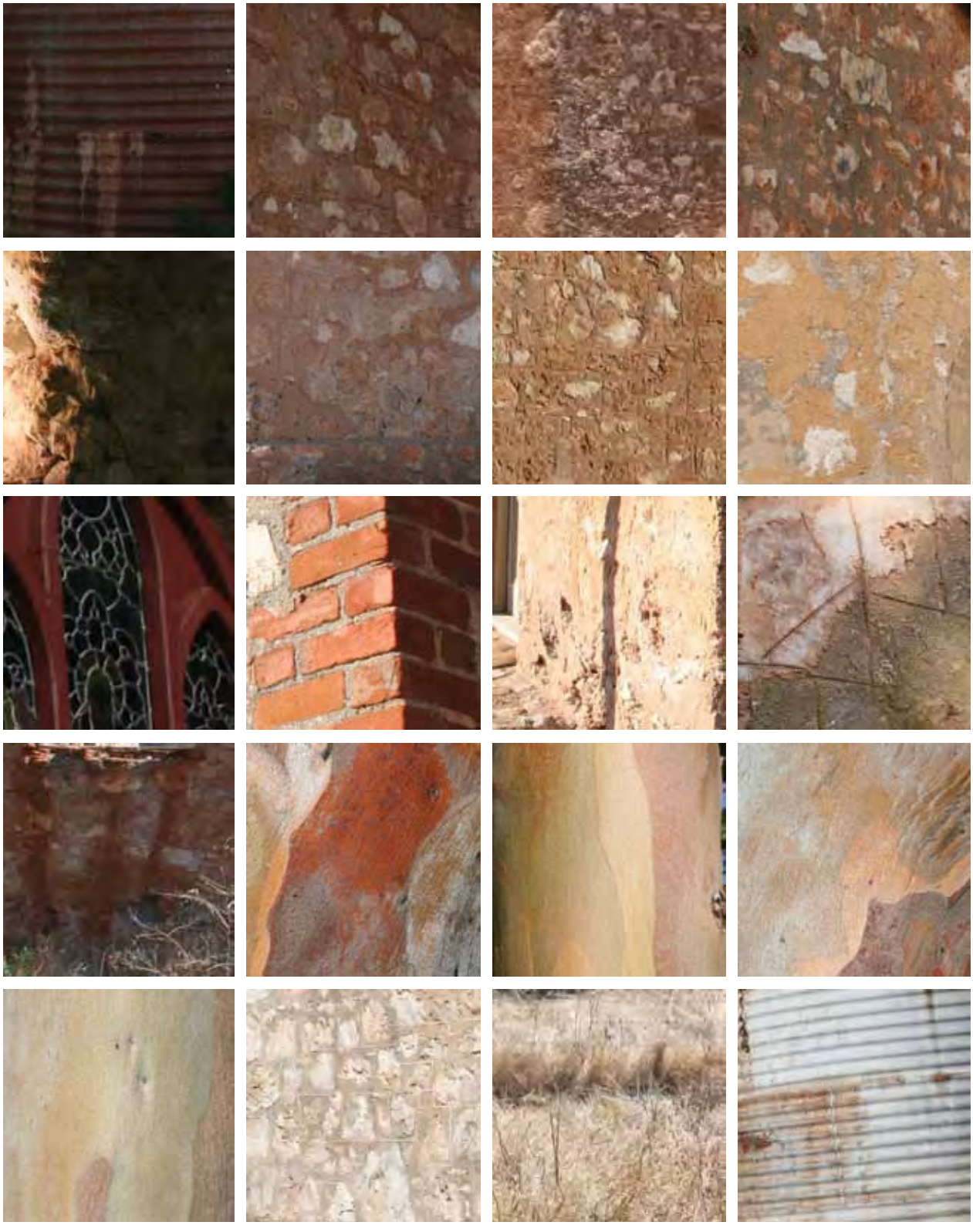


**Figure 11. Coastal Plain colour palette (1)**

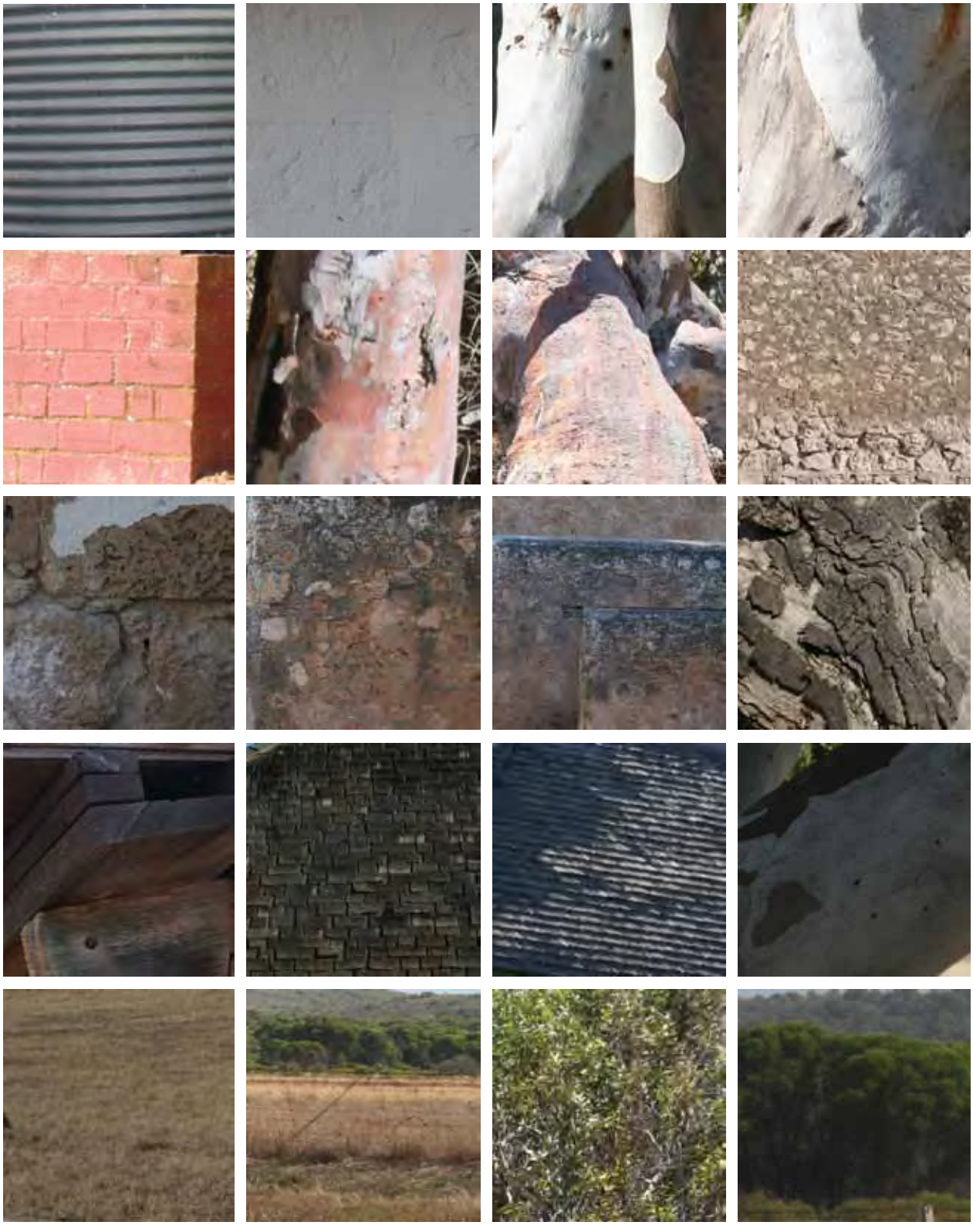


**Figure 12. Coastal Plain colour palette (2)**

**Figure 13. Coastal Plain colour swatches (1)**

**Figure 14. Coastal Plain colour swatches (2)**

Texture

The textures of the Coastal Plain LCU are taken from similar elements as the colours, but the focus is on the detailed surface appearance and the relation of elements seen from a distance.

The textures range from fine, busy, intense details seen in the foreground to broad textures comprising built form, vegetation and landform. The palette has been shown in grey scale so the colour does not dominate, and allows the surface appearance to dominate. There is a rich array of details when seen in close proximity, especially in the various size and forms of limestone.

**Figure 15. Coastal Plain texture palette (1)**

**Figure 16. Coastal Plain texture palette (2)**

Materials

The materials of the Coastal Plain LCU are taken predominantly from the built form. Materials include limestone blocks in various shapes, sizes and laid in various ways, red and orange brick, timber and low reflective metals, especially corrugated iron.

The materials of the Coastal Plain LCU are also appropriate for the CP-B Sub unit. Taking design inspiration from the elements of the whole Coastal Plain LCU would result in built form which blends successfully with the surrounding landscape. The three images on the bottom row of Figure 17 indicate examples of built form found in the CP-B sub-unit.

**Figure 17. Coastal Plain materials palette**

Form

The forms of the Coastal Plain LCU are taken predominantly from the landscape and some built elements. Most of the historic buildings have an imposing mass; high forms rise up from the flat plain. Some of these mass forms are nestled into copses of thick vegetation which softens the bulky nature of the buildings. The predominant form of the Coastal Plain natural landscape is unequivocally flat, horizontally linear, expansive and open. The constant western backdrop of the dune face frames and accentuates the planar form of the flats. The Coastal Plain LCU changes form the expansive, flat nature to a more gently undulating form further south with stretches of vegetation.

There a variety of contemporary and heritage built from scattered mainly at the base of the dunes as protection from the winds which blow freely over the open, flat plain.

**Figure 18. Coastal Plain form palette (1)**

**Figure 19. Coastal Plain form palette (2)**

## 4.3 Design Guidelines

Design guidelines have been developed from an analysis of the visual elements of landscape character as described in Section 4.2 - Design Opportunities. The broad key findings for visual management for the study area described in Section 4.1 – Key findings for Visual Management, can be achieved through following the specific objectives. Development may be guided by the following objectives depending on the location:

a. not evident: development should not be visible from key viewing locations

b. blending: development may be evident but not prominent by blending with the surrounding landscape

c. prominent: development may be a dominant feature in the landscape

### EXISTING EXAMPLES

The analysis revealed that within the study area, there are existing appropriate and inappropriate design and siting examples for the Dune and Coastal Plain LCU's.

Dune System

Examples of inappropriate use of form, materials, and colours of built form are shown in **Plates 10 to 14**. Elements which contribute to visually obtrusive built form include the following:

- use of highly reflective or brightly colour building materials that contrast with the surrounding landscape, for example, bright orange roof tops which contrast with the dark green dune backdrop
- inappropriate use of dominant/accent colour ratio such as a large amount of starkly contrasting colour used as the dominant colour on the building. See **Figures 22** and **23** for examples of dominant and accent colours appropriate for the Dune System.
- siting buildings at high points of the dunes which interrupts the continuous natural dune skyline
- no vegetation visible to assist in screening possibly visually obtrusive form
- use of materials which do not reflect the coastal character
- roads and tracks that cross contours and traverse directly up the dune face.

Plate 10. High reflectivity

Plate 11. Skylining buildings and high reflectivity

Plate 12. Skylining buildings, however the colour is appropriate as it blends with the surrounding landscape

Plate 13. Inappropriate materials for a coastal area

Plate 14. Track not following contour of landform, instead it traverses directly over the dune face

Examples of appropriate built form siting within the Dune System are shown in Plates 15 to 18.

Plate 15. Houses nestled into vegetation at base of dunes


Plate 16. House walls screened by vegetation, however the roof is excessively reflective

Plate 17. Road and buildings are nestled into and screened by the vegetation and folds in the landform

Plate 18. Road follows the folds in the landform

Coastal Plain

Elements which contribute to visually obtrusive built form include the following:

- attempts to mimic heritage character rather than using contemporary design elements. This results in inappropriate form and use of colour ratio.
- locating buildings within the foreground view of observers which restrict views to the dune ridge
- use of highly reflective or brightly coloured materials which contrast with the surrounding landscape, such as galvanised roofs (**Plate 19**)
- inapprorpiate use of dominant/accent colour ratio such as a large amount of starkly contrasting colour used as the dominant colour on the building. See **Figures 25** and **26** for examples of dominant and accent colours appropriate for the Coastal Plain.
- siting buildings at high points in the landscape which interrupts the continuous natural dune skyline
- no vegetation visible to assist in screening possibly visually obtrusive form

Plate 19. Roof has high reflectivity. Ratio of bright colour and bending colour is inapproriate

Plate 20. Building skylining as a result of its location a ridge and the roof is highly reflective

Plate 21. Roofs highly reflective, however there is some vegetation screening

Examples of appropriate built form siting, materials and colours within the Coastal Plain are shown in **Plates 22 to 25**

Plate 22. Appropriate use of heritage colour and materials used in accordance with contemporary design. Also successful partial vegetation screening.

Plate 23. Roof colour blending and successful blending of vegetation and built form

Plate 24. Roof colour and partial vegetation screening appropriate

Plate 25. Road following swale in landform with partial vegetation screening

## GENERAL GUIDELINES

There are a number of design guidelines which apply to the entire study area. These are predominantly related to site clearing, built form mass, height and roofline and materials.

General

- ensure there is minimal site disturbance
- retain select native vegetation
- built form to respond to natural topography
- minimise mass of buildings by variations in walls and roof lines
- ensure natural elements retain their dominance in the landscape through by the height of built form. Where the elevation is up to 20m (refer Map 5) building height should not exceed 25m AHD. Where the elevation is above 20m AHD, ensure at least half of the dune face is visible above the built form. This is a general recommendation which requires additional site specific assessments of individual development applications to determine visual impacts. The aim is to ensure a variable height of dune face is the dominant visual feature. See **Figure 20.**

Roof

The roofing of a building is to be of a scale, form, material and colour that reflects a distinctive architectural theme and local architectural character. Due to the building height restrictions, all dwellings require innovation in roof form that:

- aligns roof pitch with the natural slope of the land where applicable
- use pre-coloured corrugated metal or 'custom orb' roof sheeting.

Materials

- Built form is to include a blend of building materials, colours and textures to create architectural interest and reflect local character.
- A materials/colour schedule is to be submitted with a development application for buildings, including coloured elevations for planning approval.
- Materials are to be chosen which are appropriate to the LCU's environment (i.e. taking into account the high exposure to salt, wind, solar degradation and coastal storms).
- Materials should be used as a device to break up the building mass through appropriately proportioned use of materials and colours, and variation of wall and roof lines.

**Figure 20. Variable dune face visible above built form of consistent height**

## GUIDELINES FOR THE DUNE SYSTEM

The broad key findings for visual management for the dune system are:

- protection and maintenance of visual character
- restoration of degraded landscapes and enhancement of opportunities.

To achieve these, design guidelines have been developed using the following specific objectives:

- not evident: development not to be visible on the dune face
- blending: development may be evident from view points west of the skyline but should blend in with the surrounding landscape.

The built form of the Dune System LCU should reflect the existing local natural environment. The following guidelines have been provided to ensure future development 'blends' with the dunal landscape.

Topography and Vegetation

- It is preferable if development avoid cut and fill methods which level out the landform. Instead, the natural contours of the land should be retained, so development sits within the larger landscape.
- Mass of buildings to be minimised by variations in walls and roof lines, reflecting the undulating, interwoven dune forms as shown in **Figure 20** (previous page). The form palette (**Figure 21**) illustrates the Dune System landform in simplified lines to highlight the undulating, interwoven forms, which can be used as design inspiration in built form, especially rooflines. See **Plate 26** for an example of a structure reflecting the dune forms at Coogee Beach.
- Vegetation to be retained on the dune ridgeline and skyline.
- Development to have vegetation screening and/or be nestled into existing vegetation and into the folds of the landform
- Cleared areas for development within the dunes to retain corridors of vegetation which align with the topography eg **Plate 15**. This landscape would visually absorb built form if located in the swales of the land and behind or nestled against the vegetation.

Plate 26. Shelters at Coogee Beach reflecting dune forms

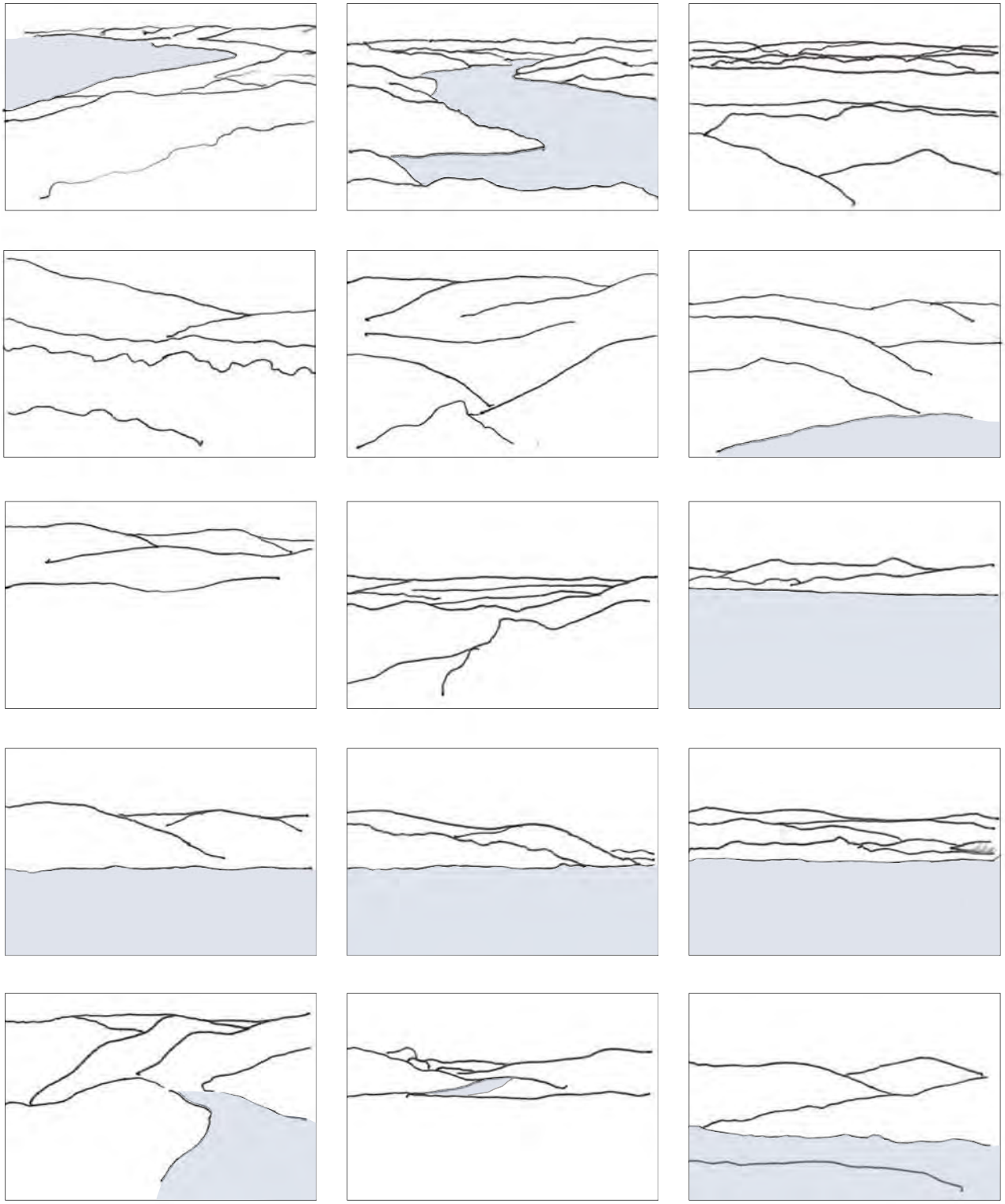


**Figure 21. Dune System form analysis**

Visibility

- It is preferable if no built form to be visible above the dune skyline from Brand Highway or the coast, except at identified coastal nodes.
- Some dune face should be visible between building roofline and dune skyline. This may require additional site specific assessments of individual development applications to determine visual impacts. See **Plate 27** for example.
- The building mass and scale should be reduced by developing a number of smaller buildings in place of a larger one.

Roads and Tracks

- Roads within the Dune System LCU should be designed to provide view corridors with ocean and coastal plain glimpses. Roads and tracks should follow the contours of the landform and be sited in the swales, not run directly over high points or ridgelines.
- Vegetated buffer zones and setbacks along roads should be applied where applicable, based on individual site assessment.

In Key View Areas:

The key views within the Dune System where development should be not evident is within the DS-A LCU (Bordered by Greenough River). The key views identified within this unit are:

- View 1 – south west view from Greenough River Road towards the river
- View 20 – view from lookout along the Greenough River Trail

For other key views within the Dune System:

- It is preferable if development be located at base of dunes. As the built form will sit between the dunes and the plain, elements from both the dune landform and the plains landform can be incorporated into the built form, to blend with the landscape. To blend built form with the surrounding landscape, rooflines can incorporate the undulating nature of the dune skyline (see **Plate 26** for example) to incorporate the horizontal lines of the open Flats.
- All development to have vegetation screening and/or be nestled into existing vegetation and into the folds of the landform.
- Development to retain corridors of vegetation which align with the topography. This vegetation would visually absorb built form if the development is located in the swales of the land and behind or nestled within vegetation.

A strong sense of identity is created for an area through site-responsive design. This entails establishing the character of the site through identifying the opportunities each site presents, as identified in **Section 4.2 Design Opportunities**. The colours, textures, materials and forms of the Dune System are used to guide development of the built form. The elements of the Dune System are shown in the following palettes which can be used in the design stages to ensure development will reflect and enhance the landscape qualities. The colours, textures and forms of the landscape should be used in the built form colours, textures, form and siting.

The following colour swatches reflect the colours and proportion of colour found in the Dune System.

Plate 27. Dune face visible above built form

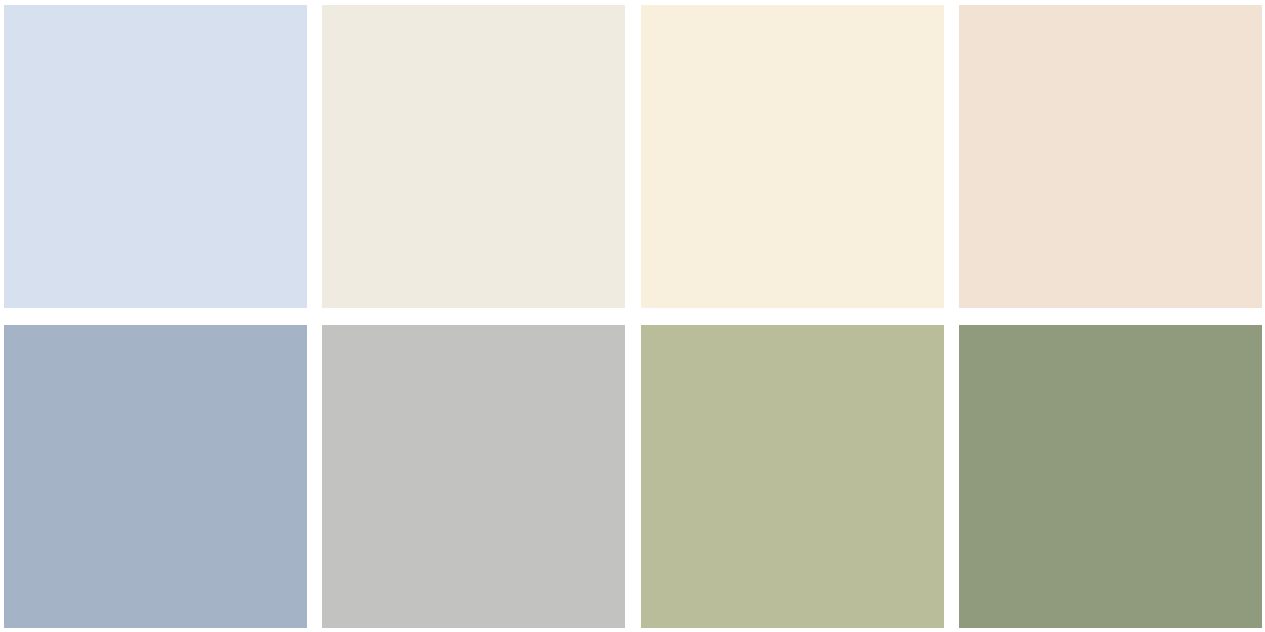


**Figure 22** indicates the less saturated colours which should form the majority of built form colour in the Dune System LCU. The accent colours shown in **Figure 23** should be used sparingly. With the correct ratio of dominant to accent colours, built form will reflect the ratio of dominant to accent colors present in the landscape and therefore blend with the surrounding landscape successfully.

**Figure 22. Dune system dominant colour swatches**

**Figure 23. Dune system accent colour swatches**

## GUIDELINES FOR COASTAL PLAIN

The broad key findings for visual management for the coastal plain (DoP, 2007) are:

- protection and maintenance of visual character at key locations
- best practice siting and design for most of the coastal plain
- restoration of degraded landscapes and enhancement of opportunities.

To achieve these, the design guidelines have been developed using the following specific objectives:

- not evident: development not to be visible in front of specific key views from Brand Highway as identified on **Map 11**
- blending: development may be evident but should blend with the surrounding rural and heritage landscape character.

The built form of the Coastal Plain LCU should reflect the existing local natural environment and heritage buildings. Below are general guidelines for the Coastal Plain, in addition to specific guidelines relating to Key View areas, see **Section 4**.

Topography and Vegetation

- It is preferable to avoid cut and fill methods which level out the landform. Instead, the natural contours of the land should be retained, so development sits within the landscape.
- Minimise mass of buildings by variations in walls and rooflines.
- Retain all existing vegetation, except for identified weed species.
- Screen development with native vegetation and/ or nestle into existing vegetation and into the swales of the landform.
- Cleared areas for development within the dunes to retain corridors of vegetation which align with the topography. This landscape would visually absorb built form if located in the 'folds' of the land and behind or nestled against the vegetation.

Visibility

- It is preferable if no built form to be visible above the dune skyline from Brand Highway
- Ensure natural elements retain their dominance in the landscape through limiting the height of built form. Where the elevation is up to 20m (refer Map 5) building height should not exceed 25m AHD. Where the elevation is above 20m AHD, ensure at least half of the dune face is visible above the built form. This is a general recommendation which requires additional site specific assessments of individual development applications to determine visual impacts. The aim is to ensure a variable height of dune face is the dominant visual feature, especially where buildings are sited.
- Reduce imposing building mass and scale by variations in walls and rooflines, reflecting the linear, horizontal, open nature of the Coastal Plain as shown in **Figure 24** (**form palette**).

Roads and tracks

- Vegetated buffer zones and setbacks should be applied along roads where applicable, based on individual site assessment.
- Screen or rehabilitate tracks that traverse straight up the dune face as indicated on **Plate 14** and **Map 11**.

Density

- The density of the built form can have a negative effect on the visual landscape character. The DPI (2007) suggests that performance criteria be developed which restricts the number of visible buildings in a landscape "before the character is perceived to have change from rural to urban in character."

Due to the open views over the flat and open coastal plain (CP-A), individual key views from Brand Highway have specific guidelines to achieve the 'blending' objective and to protect views towards the Dune System.

The coastal plain south of Wakeford Road (**CP-B**) has greater capacity to absorb development, as it is possible to blend or screen development using the natural landform and vegetation.

The following suggested guidelines apply particularly to the areas designated 'Blending' and 'Not Evident' within the Coastal Plain LCU and apply to both CP-A (flat coastal plain) and CP-B (undulating coastal plain); as shown on **Map 11 Visual Management Objectives**.

In Blending areas:

- cluster development into nodes; the form of the 'clusters' to reflect the south-west to north-east orientation of dune forms as seen from the air. Intersperse development with clear areas reflecting the open, flats character and to create view corridors
- retain open, rural character of the Coastal Plain, especially in the foreground
- buffer development with vegetation if it is located close to Brand highway
- minimise mass of buildings by variations in walls and rooflines, reflecting the linear, horizontal, open nature of the Coastal Plain as shown in **Figure 24** (**form palette**). The form palette illustrates the Coastal Plain landform in simplified lines to highlight the linear forms, which can be used as design inspiration in built form, especially rooflines. The Greenough Hamlet Cafe shows appropriate building design, see **Plate 22**.

For key views within the Coastal Plain where development should be not evident is within the CP-B LCU (coastal plain south of Wakeford Road). The key views identified within this unit are:

- Views 12 and 13 – south west and north west view of the significant portion of the dune seen in profile at Bookara. The view of this significant landform should be retained as it reflects the change in landform orientation within the study area.

For other key views within the Coastal Plain:

- development should be located at base of dunes. As the dune forms a backdrop to the built form in this area, the roofline form can incorporate more of the undulating nature of the dune skyline, as well as the linear, horizontality of the open Flats
- all development to have vegetation screening and/or be nestled into existing vegetation and into the folds of the landform.
- development to retain corridors of vegetation which align with the topography. This vegetation would visually absorb built form if the development is located in the swales of the land and behind or nestled within vegetation.

A strong sense of identity is created for an area through site-responsive design. This entails establishing the character of the site through identifying the opportunities each site presents, as identified in **Section 4.2**. The colours, textures, materials and forms of the Coastal Plain LCU are used to guide development of the built form and surrounding landscape. These elements are taken from this particular landscape and shown in the following palettes to indicate a process where all development will reflect and enhance the landscape qualities. The colours, textures and forms of the landscape should be used in the built form colours, textures, form and siting.

The following colour swatches reflect the colours and proportion of colour found in the Coastal Plain (**Figures 25-26**).

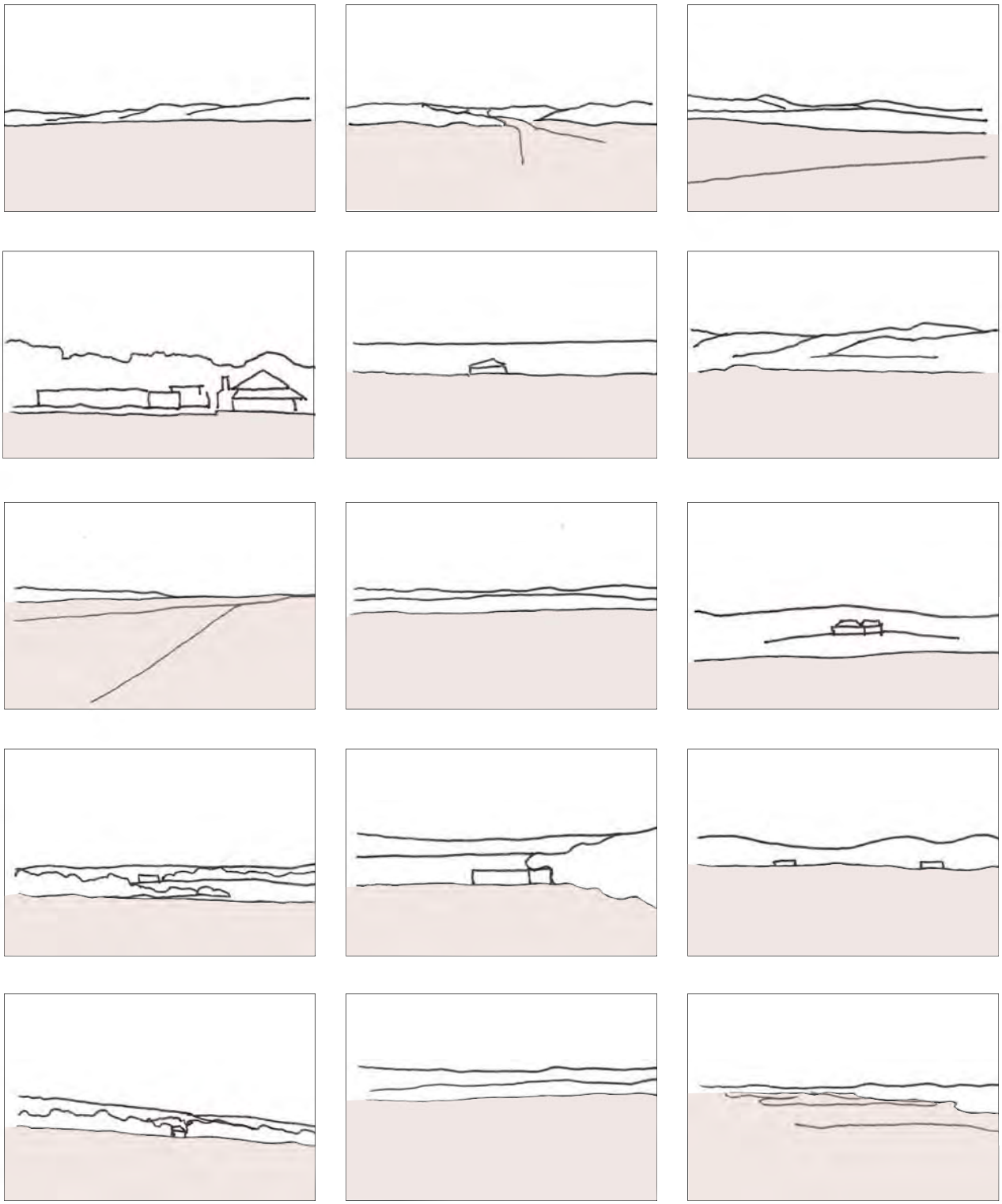


**Figure 24. Coastal plain form analysis**

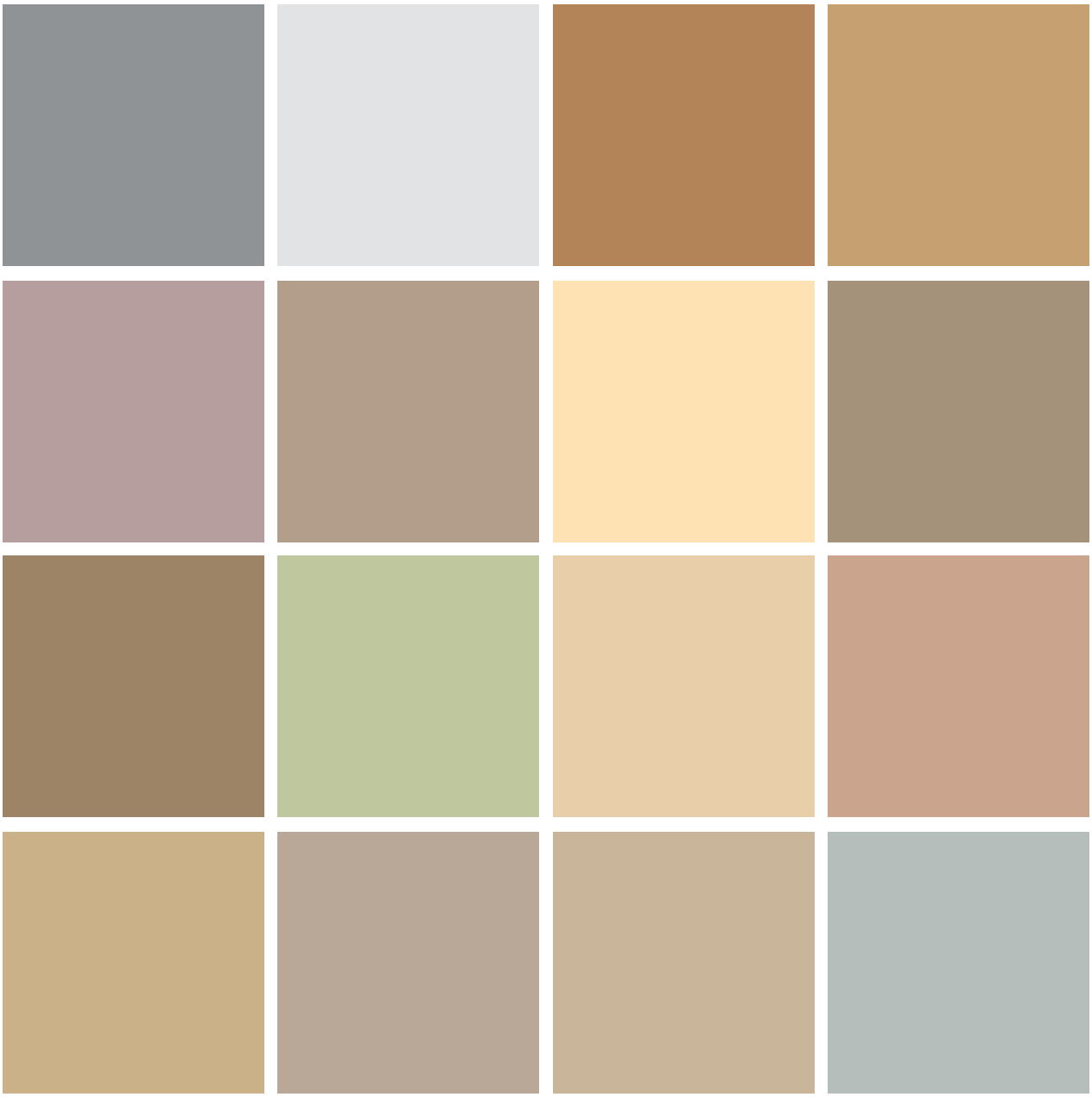


**Figure 25.  Coastal plain dominant colour swatches**

**Figure 25** indicates the less saturated colours which should form the majority of built form colour in the Coastal Plain LCU. The accent colours shown in **Figure 26** should be used sparingly. With the correct ratio of dominant to accent colours, built form will reflect the ratio of dominant to accent colors present in the landscape and therefore blend with the surrounding landscape successfully.

**Figure 26. Coastal plain accent colour swatches**

# 5.0 References


Beard, JS (1976), 'Murchison - Vegetation Survey of Western Australia, Sheet 6, 1:100000 Vegetation Series'. University of Western Australia Press, Nedlands, W.A., 1 map.

City of Geraldton-Greenough (no date) Greenough/ Walkaway Heritage Trail Pamphlet. Third edition.

Conservation and Land Management, Department of (CALM) (1994) Reading the Remote: Landscape Characters of Western Australia. CALM, Perth.

Curtin University (2006) Coastal Assessment and Restoration Project (CAR). Digital shapefiles supplied by Northern Agricultural Catchments Council (NACC), Geraldton.

Department of Agriculture and Food WA (DAFWA) (2007), Soil Land Systems of the South West of Western Australia, Department of Agriculture and Food Western Australia, Perth

Department of Environment, Water, Heritage and Arts (DEWHA) (2010) Australian Heritage Database [online]. Available: http://www.environment.gov.au/cgi-bin/ahdb/search.pl [2010, March 9].

Department of Environment, Water, Heritage and Arts (DEWHA) (2007) Australian Natural Resources Atlas – Economics: Greenough River [online]. Available: http://www.anra.gov.au/topics/economics/costs-returns/wa/basin-greenough-river.html#context [2010, March 5].

Department of Planning and Infrastructure (DPI) (2007) Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design. Western Australian Planning Commission, Perth.

Ecoscape (2009) Dongara to Cape Burney Coastal Vegetation Survey. Unpublished draft report for Northern Agricultural Catchments Council (NACC).

Government of Western Australia (2010) Places Database [online]. Available: http://register.heritage.wa.gov.au/search_results.html [2010, March 9].

Landgate Digital contour data. Supplied by the Department of Planning.

O'Brien Planning Consultants (1997) Flat Rocks Structure Plan. Report prepared from D W Barber and Associates.

# Appendix 1 - Geraldton Plain Description

The Geraldton Plains Landscape Character Type is typified by:

- distinct landform elements linked by dominant agricultural land use and remnants of the unique sand plain vegetation
- successive windswept coastal dune systems, scattered erosional features are part of the limestone belt with caverns and rocky gullies
- alluvial plains are met by a series of steep-sided flat topped low ranges capped by compacted, cemented pea gravel
- smooth mosaic of green dense heath, interrupted by glossy green Grass Trees and Zamias, low Banksia woodlands with scattered pockets of taller Eucalypt woodlands
- limited waterforms due to moderate rainfall and gentle landform with porous sandy soils, flowing only in winter and consisting of meandering rivers, interdunal depressions, swamps and lakes
- land use dominated by agriculture and marine industries, with urban land use also visible.

A visual quality frame of reference has been developed for this region that classifies the landscape into high, moderate and low visual quality features.

**Table 5. Visual quality frame of reference for the Geraldton Plains, adapted from CALM (1994).**

| CRITERIA | HIGH | MODERATE | LOW |
|---|---|---|---|
| Landform | Variable | Gradual | Uniform |
| | • High rounded hills or ridges<br>• Mesas, ranges, escarpments<br>• Steep slopes<br>• Strongly dissected valleys<br>• Cliffs and headlands<br>• Islands and reefs<br>• Irregular coastline edges<br>• Active primary dunes | • Beaches of uniform width and colour<br>• Gently undulating plains, rounded hills of similar gradient | • uniform landscape with few visually distinctive features |
| Vegetation | Diverse | Less Diverse | Uniform |
| | • single trees or shrubs that are a focal point<br>• native vegetation displaying diversity in colour, texture, height<br>• distinctive displays of seasonal colour<br>• unusual form, e.g. wind-shaped<br>• strong vegetation patterns | • some structural, texture and colour diversity but not visually distinctive or unique compared to surrounding landscape | • extensive area of vegetation with repetitive patterns showing little variation |
| Waterform | Permanent / variable / natural | Intermittent / uniform / natural | Absent / non – natural |
| | • all estuaries, inlets, lakes, swamps<br>• unusual ocean shoreline<br>• river pools and other permanent water features<br>• steep river valleys | • seasonal wetlands, intermittent streams and creeklines<br>• uniform coastline | • waterforms absent |

# Appendix 2 - European Heritage Sites

Sites on the Register of National Estate for the Greenough Region (DEWHA, 2010)

| | | |
|---|---|---|
| 1 | Barn Cottage | McCartney Rd |
| 2 | Bell Cottage and Outbuildings | Brand Hwy |
| 3 | Burma Road Reserve | Burma Rd |
| 4 | Central Greenough School Building (former) | Clinch Pl |
| 5 | Cliff Grange Farmhouse | Clinch Pl |
| 6 | Clinchs Mill | Clinch Pl |
| 7 | Courthouse, Police Station and Gaol (former) | Clinch Pl |
| 8 | Delowes Cottage | Crowther Rd |
| 9 | Dominican Convent (former) | Clinch Pl |
| 10 | Eakins Farmhouse Ruin | Brand Hwy |
| 11 | Grays Store (former) | Company Rd |
| 12 | Greenough Farmers Club Hall (former) | Brand Hwy |
| 13 | Greenough Historic Hamlet | Clinch Pl |
| 14 | Greenough Hotel (former) | Brand Hwy |
| 15 | Hacketts Cottage | Clinch Pl |
| 16 | Hampton Arms Hotel | Company Rd |
| 17 | Maleys Bridge | McCartney Rd |
| 18 | McNeeces Cottage | Brand Hwy |
| 19 | Mount Pleasant Farmhouse | Company Rd |
| 20 | Old Greenough Cemetery | Brand Hwy |
| 21 | Old Store | Clinch Pl |
| 22 | Old Walkaway Cottage | Brand Hwy |
| 23 | Pioneer Museum | Phillips Rd |
| 24 | Priests House (former) | Clinch Pl |
| 25 | Raphoe Farmhouse and Outbuildings | Company Rd |
| 26 | Road Board Office (former) | Clinch Pl |
| 27 | Rock House | Company Rd |
| 28 | St Catherines Anglican Church | Clinch Pl |
| 29 | St Catherines Anglican Church Hall | Clinch Pl |
| 30 | St James Anglican Church (former) | Brand Hwy |
| 31 | St Josephs School (former) | Clinch Pl |
| 32 | St Peters Catholic Church | Clinch Pl |
| 33 | Stokes Cottage | Brand Hwy |
| 34 | Stone Barn | McCartney Rd |
| 35 | Temperance Lodge (former) | Company Rd |
| 36 | Three Bottle Farmhouse and outbuildings | Company Rd |
| 37 | Wesley Church (former) | Company Rd |

Sites on the WA Heritage Council Register for the Greenough Region (Govt. WA, 2010)

| | | |
|---|---|---|
| 1 | Central Greenough School Building (1156) | Gregory Road, Greenough |
| 2 | Cliff Grange Farmhouse (1154) | Gregory Road, Greenough |
| 3 | Clinch's Mill (1146) | Gregory Road, Greenough |
| 4 | Corringle (1134) | Brand Hwy, Greenough |
| 5 | Dominican Convent (fmr) (1142) | Gregory Road, Greenough |
| 6 | Glengarry Station Complex (3726) | Glengarry Rd, Moonyoonooka |
| 7 | Gray's Store (1153) | Cnr Company & McCartney Rds, Greenough |
| 8 | Greenough Court House, Police Station and Gaol (1157) | Gregory Road, Greenough |
| 9 | Greenough Hotel (fmr) (1143) | Gregory Road, Greenough |
| 10 | Greenough Pioneer Cemetery (1133) | Brand Hwy, Greenough |
| 11 | Greenough Road Board Office (fmr) (1159) | Gregory Road, Greenough |
| 12 | Hampton Arms (1151) | Company Rd (East side), Greenough |
| 13 | Holy Trinity Anglican Church (1168) | Lot 13 Walkaway-Nangetty Rd, Walkaway |
| 14 | Koogereena Homestead (13930) | Kojarena Rd South, Kojarena |
| 15 | Maley's Bridge (1166) | McCartney Rd, Greenough |
| 16 | Maley's Mill (1165) | Phillips Rd, Greenough |
| 17 | Newmarracarra (3443) | Kojarena via, Bringo |
| 18 | Old Store (1152) | Gregory Road, Greenough |
| 19 | Pioneer Museum, Greenough (4285) | 1 Phillips Rd, Greenough |
| 20 | Priest's House (fmr) (1158) | Gregory Rd, Greenough |
| 21 | Saint Catherine's Anglican Church (1161) | Gregory Road, Greenough |
| 22 | St Catherine's Church Hall (1160) | Gregory Road, Greenough |
| 23 | St James Chapel, Kojarena (3958) | Kojarena South Rd, Geraldton |
| 24 | St Joseph's School (fmr) (1164) | Gregory Road, Greenough |
| 25 | St Peter's Catholic Church (1162) | Gregory Road, Greenough |
| 26 | Walkaway CWA Rooms (13926) | 1 Evans Rd, Walkaway |
| 27 | Walkaway Railway Station Museum (1170) | Padbury Rd, Walkaway |
| 28 | Wesley Methodist Chapel (fmr) (1167) | Cnr Company & McCartney Rds, Greenough |

# Appendix 3 - Key View Descriptions

| MAP REFERENCE NUMBER | DESCRIPTION OF VIEW |
|---|---|
| 1 | Axial view obtained from lookout at river bend on road to mouth of Greenough River. Looks south along the slightly sinuous linear river corridor, enclosed by dune system on west and river bank on east. Ephemeral interest is provided by water surface and waterbirds eg pelicans. Similar views would be obtained from along the walk trail that borders the lower reaches of the river (map of trail on photo 338) |
| 2 | First view of 'Front Flats' travelling south from Geraldton. A 'gateway', orientation view. View located at intersection of Brand Highway and Devlin's Pool Road. |
| 3 | Similar view to 1. but in opposite direction and from water level. Colour contrast provided by samphire flats that border the river. Views both upstream and downstream, with upstream views into drier section of the river where it is not enclosed by dunes and is open on both sides. |
| 4 | Extensive eastwards view across 'Front Flats' from slightly elevated position on dune face, on African Reef Boulevard intersection. |
| 5 | Extensive westwards view across 'Front Flats' from very elevated position on the limestone ridge on Phillips Rd, outside the study area. An example of views obtained from roads that pass over the limestone ridge. The interior of the dune system, and the ocean, are not visible. |
| 6 | Southwards view from 'S Bend', at the junction of Brand Highway and Company Road. The road here is oriented directly towards the dune face, focussing motorists attention on this dominant feature. From here southwards the road is closer than the section of highway between here and Geraldton, and this is the first location from which motorists on the highway obtain a closer view of the dune face. |
| 7 | Elevated eastwards view across the 'Front Flats' from access road to Flat Rocks on the coast. |
| 8 | View south towards the low dune ridge that encloses the southern end of the 'Front Flats'. An orientation point along the journey from Geraldton to Dongara as this ridge marks the boundary between the very open, flat landscape of the 'Front Flats' and the more enclosed, more vegetated, slightly undulating landscape of the coastal plain south of this point. |
| 9 | View northwards from the low dune ridge that encloses the southern end of the 'Front Flats'. An important orientation point, as described above for view 8 above. From a slightly elevated position, providing the first view over the extensive 'Front Flats'. |
| 10 | Southwards view across a distinctive, gently-sloping swale that features an older farmstead set amongst trees at the base of the swale. The backdrop is unusual for highway views as the dune system partly encloses the view directly ahead, appearing to 'wrap around' from west to south. |
| 11 | Northwards view featuring the same expansive swale as the subject of view 10 above. For those familiar with the road, the view ahead of the low ridge across the road signals that the start of the Front Flats is close. |
| 12 | Unusual feature view (southwards direction), focussed on the profile of the dune face where the dune system changes basic direction from NNW to NW. |
| 13, 13a | Same as view 12, but northwards direction. The dune profile is more striking when viewed from this direction. |
| 14 | Northwards view across landscape that is unusual for the study area in that the coastal plain component is undulating and contains significant areas of remnant vegetation. Backdrop of the vegetated dune ridge extending inland across the highway. |
| 15 | Southwards view of the highway where it climbs the part of the dune system that extends inland. Distinctive due to its contrast with other views available between Dongara and Geraldton, as the highway crosses the dune, and the dune supports the only remnant vegetation that the highway passes through. |

*Table continues on next page*

| MAP REFERENCE NUMBER | DESCRIPTION OF VIEW |
|---|---|
| 16 | Elevated eastwards view across the coastal plain from access road to Seven Mile Beach on the coast. |
| 17 | First northward view across the coastal plain within the study area, from a slightly elevated position. |
| 18 | Pointed dune forms |
| 19 | Northern gateway view over undulating landform and mobile dune. |
| 20 | View from Lookout over Greenough River |
| 21 | Coastal views from Lucy's Beach |
| 22 | Coastal views from Flat Rocks |
| 23 | Views over undulating landform of the coastal plain which differs from the very flat and open coastal plain to the north |
| 24 | Coastal glimpses from Seven Mile Beach |
| 25 | Coastal views from Seven Mile Beach |
| 26 | Coastal view from Flat Rocks |
| 27 | View over dune system that extends to Brand Highway |

# Appendix 4 - Access Level Descriptions

## LEVEL 1: NATIONAL/STATE SIGNIFICANCE

- State highways and other main roads (sealed or unsealed) with high levels of vehicle usage
- designated tourist routes, scenic drives
- recreation, conservation, cultural or scenic sites, areas, viewpoints and lookouts of state or national significance, including their access routes
- walking, cycle or bridle tracks of national or state significance
- towns, settlements or residential areas
- passenger rail lines
- navigable waterways of national or state recreation importance
- ocean sites of national or state recreation importance eg surf breaks
- views of national or state importance

## LEVEL 2: REGIONAL SIGNIFICANCE

- main roads with moderate levels of vehicle usage (sealed or unsealed)
- recreation, conservation, cultural or scenic sites, areas, viewpoint, and lookouts of regional or high local significance (including their access routes)
- navigable waterways of regional recreation significance
- walk, cycle or bridle paths of regional significance
- views of regional importance

## LEVEL 3: LOCAL SIGNIFICANCE

- all remaining roads with low levels of vehicle usage
- locally significant roads or tracks
- recreation and other use areas of local significance
- navigable waterways of local recreational significance
- walk, cycle or bridle paths of local significance
- views of local importance

## EXPLANATORY NOTE - SIGNIFICANCE INCREASES WITH THE:

- importance of views, including type, features, rarity;
- volume of use of roads, trails and navigable waterways;
- degree of sensitivity of viewers; those who are more likely to be more sensitive include wilderness users, other recreational users, tourists, people who choose to live in an area because of its landscape character and views (eg assessed by noting how vocal observers are about specific travel routes or use areas, indicated in letters, protests etc);
- degree to which experiencing the landscape is integral to enjoyment of a travel route or site. Is it the focus of the use, as in recreational use, or just incidental, as is more likely with people using a route to work?
- length of duration of a view; range could include glimpses from a high speed road, longer duration views obtained from roads used for sightseeing or from recreation sites and lookouts and very long and frequent views from the main living areas of homes

# Appendix 5 - Preference indicators for natural and rural landscapes (DPI, 2007)

## MOST PREFERRED NATURAL CHARACTERISTICS

- high degrees of perceived naturalness
- high degree of topographic variety or vertical relief (dramatic relief, ruggedness, rock outcropping, outstanding ridgelines and beach forms)
- vegetative diversity (distinctive patterns, species composition, height, colour and texture)
- diversity of vegetation age and density (structural complexity)
- unusually expansive landforms or vast horizontal scale (desert landscapes, beach and dune fields, rolling hills)
- presence of water bodies (waterfalls, rivers, estuaries, oceans, lakes, inundated areas)
- distinctive displays of colour: soils, vegetation (often seasonal), topography, rock formations or water bodies
- distinctive landscape features (waterfalls, unique plants, reefs, geological formations such as ranges, cliff faces and granite outcrops)
- outstanding combinations of landform, vegetation patterns and water features in one area
- seascapes (combinations of ocean, reefs, beach, dune formation, coastal rocks, coastal vegetation)
- areas or sites frequently prone to ephemeral features (fauna, water or wave conditions, beach erosion scarps, climatic conditions)

## LEAST PREFERRED NATURAL CHARACTERISTICS

- disturbed areas with little evidence of naturalness
- areas of diseased, dead or dying vegetation
- areas with severe weed infestations in a natural landscape
- areas of soil erosion (especially where human-induced)
- water bodies with degraded banks, weed infestations, stagnation, eutrophication, algae or litter
- evidence of mining (gravel pits, sand mines, limestone)

## MOST PREFERRED RURAL CHARACTERISTICS

- unusual diversity in agricultural landscapes (colour and contrast or species diversity of cropping)
- agricultural patterns, colours and textures that complement natural features
- gradual transition zones between agricultural land and natural landscape
- topographic variety and ruggedness
- presence of water bodies (dams, lakes, inundated areas) that borrow location, shape, scale and edge configuration from natural elements
- areas or sites frequently prone to ephemeral features (presence of fauna, distinctive crop rotations, water conditions and climatic conditions)
- significant landscape features (trees and tree stands, historic relics, some windmills and areas of unusual topographic variation)
- settlement patterns and individual structures that strengthen the local rural character (silos, windmills, water tanks, historic buildings, bridges, hay bales and dams)
- historic features and land use patterns that strengthen the local rural character (historic farm machinery, old shearing sheds, windmills and historic buildings)
- distinctive remnant vegetation located along streamsides, roadsides and in paddocks (parkland cleared paddocks)

*Table continues on next page*

## LEAST PREFERRED RURAL CHARACTERISTICS

- areas of soil salinity/salt scalds or dead, dying or diseased vegetation
- areas of extensive weed infestation
- eroded areas
- tips, dumps and landfill areas
- recently harvested areas (stumps, debris, abandoned off-cuts)
- land use areas that contrast significantly from natural landscape characteristics (can include plantations, mines, rural settlement and/or housing, utility towers, roads and fencing)
- abandoned structures in a state of disrepair or destruction
- unmanaged roads and access tracks
- farm structures and buildings in a state of disrepair
- jetties and other marine structures that are either closed or not maintained
- eutrophied dams, lakes and water bodies

# Appendix 6 - Coastal Nodes Site Plans

Site plans have been developed for three coastal nodes and a set of considerations have been provided for Cape Burney. The coastal nodes are:

- Lucy's Beach **(Figure 27)**
- Flat Rocks **(Figure 28)**
- Seven Mile Beach **(Figure 29)**

The broad key findings for visual management for the coastal nodes is restoration and enhancement of visual character to improve the amenity and facilities for recreational purpose. 'Blending' is the specific design objective for development, by borrowing the visual elements from the surrounding landscape.

Development at the coastal nodes should include carefully designed and sited built form to ensure there is visual continuity and especially no visual clutter. The Dune System character should be reflected and/or enhanced in any development. Scale of all built form should suit the landscape in which it sits and the footprint of all built forms should be reduced as much as possible. The visibility of all built form should be contained within the immediate area. Native vegetation should be retained where possible.

## Lucy's Beach

Lucy's Beach is accessed via 2WD gravel road and whilst unsafe for swimmers, is predominantly used for surfing and fishing. The visitors have left their mark with an interesting 'scarecrow' sculpture made of bouys, ropes and other found objects.

There are no facilities, but numerous 4WD sand tracks throughout the site, resulting in a large area of degraded vegetation. There was a small amount of rubbish present when the site was visited. An existing informal car park is currently located directly adjacent to the beach, see **Plate 28**.

Considerations:

- Relocate the parking area further back from the beach. The ideal area would be where the vegetation has already been degraded and where existing tracks are located.
- Install appropropriately designed facilities: rubbish bin, toilet, shelters with table and benches.
- Install above facilities at existing tracks and cleared areas to minimise vegetation clearing.
- Rehabilitate the existing car parking area adjacent to the beach with native vegetation.
- Create one main pedestrian access path to the beach.
- Delineate parking area with wheel stops and vehicle barriers to prevent vehicle access, especially while new vegetation is being established.
- Clearly mark vehicle and pedestrian use areas.
- Rehabilitate degraded vegetation, including a track leading to a blowout entry to the site.

**Plate 28. Lucy's Beach**


**Figure 27. Site plan for Lucy's Beach**

## Flat Rocks

Flat Rocks is a major day use area which is easily accessed by a sealed 2WD road. It is a renowned first class surfing beach, where regular competitions are held including:

- State Surfing Championships in September
- 34th Annual Sunsmart Surfmasters in September
- Quiksilver Sunshine Surf Masters in September
- Annual Corner Surf Shop Sunshine Surf Masters
- Open State Series in May
- 2009 State Junior Series Event in July.

The surf events attract hundreds of people. Facilities include a toilet block, timber deck and seating for judging the surf competitions (**Plate 29**), two main car parks, three pedestrian access paths to the beach and signage noting a significant Indigenous site. The existing facilities are an inconsistent style causing the area to be visually discordant. There is also evidence of vandalism and graffiti to signage and facilities.

The area does not offer protection or shelter from the strong coastal winds. The beach surface is rocky reef and not suitable for swimming.

A track south of the site which leads to Headbutts surf spot has been overused, resulting in vegetation degradation and a blowout, see **Plate 30**. There are a number of alternative access tracks to Headbutts which do not begin at Flat Rocks. The tracks need to be rationalised to prevent dune vegetation loss and blowouts occurring along the coastline.

Plate 29. Timber viewing platform at Flat Rocks

The City of Geraldton-Greenough has produced a 'Flat Rocks Site Development Plan' which addresses vehicle and pedestrian access to the beach, car parking and viewing requirements at competitions. The plan was reviewed and modified for this report.

Considerations:

- Replace old toilet block with a new appropriately designed one and relocate closer to dune edge.
- Remove metal guardrail and signage.
- Remove concrete ramps and handrails to the beach and provide new access ramps/steps to the beach consistent with overall style and materials.
- Create picnic area with revegetation, barbecues, shelters, bin, tables and benches at northern area where existing toilets are located.
- Install new toilets closer to viewing platform.
- Rationalise the car park areas.
- Provide consistent style of paths, boardwalk, platforms, shelters, toilets, bins, fencing and vehicle barriers.
- Provide interpretation material for the Indigenous heritage site.
- Upgrade signage.
- Install additional viewing platforms as dune vegetation is being destroyed through high pedestrian use.

Plate 30. Four Wheel Drive tracks to 'Headbutts' surf beach

- Remove south bound track along the coast and create alternate access to southern beaches.
- Nestle new built form at dune edge.
- Overflow parking required for large events.
- No metal material.
- Timber shelters and seating, similar to platform.
- Rehabilitate degraded areas with native dune vegetation.


**note:**
all rehabilitation and infill planting areas to be surrounded by protective fencing and/or vehicle barriers

scale 1:1000
0 10 20 50

**Figure 28. Site plan for Flat Rocks**

## Seven Mile Beach

Seven Mile Beach is also a major day use area which is easily accessed by a sealed 2WD road. It is popular with fishermen and is being used as an informal camping spot. The existing facilities at this site include a table and bench on a concrete slab, skip bin, gravel boat ramp, sand track to the beach and an informal car park area (**Plate 32**). The sand track to the beach appears to be used by both pedestrians and vehicles. An area has been cleared of vegetation and is being used as a large vehicle/caravan parking area. There is also a 4WD sand tracks that heads north towards the Getaway Beach Chalets in the distance. This track is contributing to the degradation of coastal vegetation and erosion (**Plate 31)**.

Considerations:

- Install appropriately designed toilet.
- Remove existing table and bench and concrete slab. Replace with shelters, tables and benches.
- Move the skip bin.
- Plant out the degraded vegetation area.
- Rationalise the car parking and access road.
- Restrict vehicle access to beach to one boat ramp.
- Close north bound 4WD track.

Plate 31. Four wheel drive sand track

Plate 32. Existing facilities at Seven Mile Beach


**Figure 29. Site plan for Seven Mile Beach**

## Cape Burney

Cape Burney is a popular tourist destination located at the mouth of the Greenough River, accessed via Greenough Road (sealed 2WD) off Brand Highway. Existing facilities include shelters, tables, lookouts, car parks and toilets. The facilities are visually disjointed as not of a consistent style to match local character (**Plate 33**).

Considerations:

- A master plan should be prepared for the Cape Burney area. The master plan should:
- define access
- address ecological restoration of river foreshore vegetation. Weeds currently exist along the foreshore (**Plate 34**)
- provide trails and signage along the river- boardwalks/simple tracks
- consider providing bird hides
- provide interpretation material at nodes/along trails
- provide facilities of a consistent style
- provide historic interpretation information, e.g. popular recreation destination since European settlement.

Plate 33. Toilet block at Cape Burney

Plate 34. Giant reed on river foreshore