SOUTH GREENOUGH

2

CAPE BURNEY

COASTAL PLANNING STRATEGY

Draft – August 2012

City of Greater Geraldton
a vibrant future

DOCUMENT CONTROL		
Revision	Description	Date
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EXECUTIVE SUMMARY

The 2010 *Status of Coastal Planning in Western Australia Report* recommended the development of a planning strategy for the coastline between Greenough River mouth and Dongara to address increasing development and recreational pressures. The need for a more detailed planning and management strategy for this area was also identified in the Batavia Coast Strategy. The *South Greenough to Cape Burney Coastal Planning Strategy* (the *Strategy*) is a document developed in response to these pressures and needs.

The Strategy encompasses the coastal area west of the Brand Highway and Company Road from the Greenough River mouth at Cape Burney to the southern boundary of the City of Greater Geraldton, south of Headbutts beach. The study area has been divided into two sections based on the two dominant landscape features: the *Dune System* and the *Coastal Plain*.

The Strategy provides strategic planning guidance for future land use, development and subdivision that is consistent with local and State Government policy and sustainable development principles. It also provides management recommendations by taking into account the environmental, cultural and social values of the coastal systems.

During 2009 and 2010 (as part of the Dongara to Cape Burney Coastal Strategy project) the preparation and collation of important background information, including technical reports, was undertaken. These studies, undertaken by external consultants, included a Coastal Geomorphology report a Visual Landscape Assessment and a Vegetation Survey which are available from the WA Planning Commission's website (www.planning.wa.gov.au).

The development of the Strategy included substantial community and stakeholder engagement through varied consultation methods such as public information displays, online surveys and community workshops.

All large scale, high impact, residential and tourist resort type development should be located within the existing urban settlement of Geraldton. Coastal nodes (major and minor day use) within the study area are identified. Major nodes should continue to be managed and upgraded to ensure a high level of facilities. Overnight accommodation of a low to medium scale could potentially be developed in the immediate Flat Rocks vicinity. Minor day use nodes should provide for a lower level of facilities.

Provision of formal access to the coast will assist in reducing indiscriminate, illegal access and associated environmental degradation and management implications. It is envisaged that additional coastal access locations may be appropriate as part of low impact rural tourism proposals in appropriately located sites.

Land use, development and subdivision proposals will only be supported if proven to be in accordance with the relevant criteria for either the Dune system or the Coastal Plain. Proposals should also align with the key objectives and the local vision of the Strategy.

The South Greenough to Cape Burney Coastal Planning Strategy will be used to guide decision making within the strategy area. Implementation of the strategy's recommendations will occur through various mechanisms, including:

- scheme amendments;
- local planning schemes;
- local planning strategies;
- local planning policies;
- subdivision and development applications; and
- state and local government policies and strategies.

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(available from the WA Planning Commission's website www.planning.wa.gov.au)

- Dongara to Cape Burney, Western Australia: Coastal Geomorphology, October 2011
  Prepared by Damara WA Pty Ltd
- Dongara to Cape Burney: Visual Landscape Assessment, October 2011
  Prepared by Ecoscape (Australia) WA Pty Ltd
- Dongara to Cape Burney Coastal Vegetation Survey, August 2010
  Prepared by Ecoscape (Australia) WA Pty Ltd

1 PART I: CONTEXT

1.1 INTRODUCTION

1.1.1 Background

The coastline, stretching from the Greenough River mouth at Cape Burney to the southern boundary of the City, is rich in ecological, socio-economic and heritage values with its sandy beaches, high dune ridges and productive farmland. Like many other coastal stretches in Western Australia this area is under increasing pressure from human activity, conflicting user demands and accelerated climate change. If not adequately managed soon, these pressures will result in degradation of the coastal environment and loss of invaluable ecosystems services and functions.

The *South Greenough to Cape Burney Coastal Planning Strategy* (the Strategy) is a document developed in response to these pressures. Specifically, the Strategy provides strategic planning guidance and management strategies for future land use, subdivision and development that is consistent with local and State Government policy, sustainable development principles, and takes into account the environmental values of the coastal systems and best practice coastal management.

1.1.2 Study Area

The study area (see Figure 1) is a coastal strip approximately 28km long and 2km wide, located west of Company Road and the Brand Highway from the Greenough River mouth at Cape Burney to the southern boundary of the City of Greater Geraldton (south of Headbutts beach).

For the purpose of this Strategy, the study area has been divided into two sections based on the two dominant landscape features rather than cadastral lines. The two distinctive landscape features throughout the study area are the dune system and the coastal plain (see Figure 2).

The high ridge of dunes is fragmented by privately owned rural properties that generally extend to Company Road and the Brand Highway. There are narrow stretches of foreshore, which are either Unallocated Crown Land or reserves vested in local government. These vary in width but are generally less than 100m wide. The majority of the study area is private freehold land, with pockets of crown reserve, crown lease, Unallocated Crown Land and local government reserves (see Figure 3).

1.1.3 Purpose

In 2005 the WA Planning Commission published the Status of Coastal Planning in Western Australia Report (2004/2005). This document identified the need for and subsequently recommended the development of a coastal strategy for the coastline between Greenough River mouth and Dongara to address increasing development pressure in the future.

The WA Planning Commission's more recent Status of Coastal Planning in Western Australia (2010) states that a strategy covering the coast from the Greenough River mouth to Dongara is required to address increasing pressure. It should cover: foreshore reserve width; strategic planning (including subdivision guidance); management arrangements; and an assessment of conservation values, landform significance and recreational needs.

The Batavia Coast Strategy identifies the coastal strip between Dongara and Greenough as a priority area for more detailed, strategic planning activities to guide development and provide a strategic context for statutory provisions. Additionally, there have been a number of decisions by the State Administrative Tribunal that have acknowledged the need for "strategic plans and coastal management plans to distinguish those areas for conservation and those areas for low scale or more intensive residential development" (WATPAT 112, 2004).

In 2008, the Department of Planning, in conjunction with the (then) City of Geraldton-Greenough and the Shire of Irwin, re-commenced the planning for the Dongara to Cape Burney coast. It was initially envisaged that a strategy would be necessary to plan for this part of the coast. In 2009 the Department of Planning formed a Steering Committee and began a process to develop the Dongara to Cape Burney Coastal Strategy. Unfortunately in 2011 the WA Planning Commission resolved to not proceed with the Dongara to Cape Burney Coastal Strategy, however the outcomes of that process are being integrated into local planning processes and have been used in the development of this Strategy. The *South Greenough to Cape Burney Coastal Planning Strategy* has been commissioned by the City of Greater Geraldton using the background and technical information (technical reports, community consultation and relevant information from surveys and desktop analysis) gathered for the development of the Dongara to Cape Burney Coastal Strategy. The Strategy aims to provide guidance for the City of Greater Geraldton, the community, businesses and other government agencies on land use planning and development decisions in the study area.

1.2 PLANNING CONTEXT

The coastal environment is important to the lifestyle and livelihood of the people of Western Australia. The vast majority of the population choose to live and recreate at coastal locations. It is also important economically as it supports ports and shipping, marine industries and mineral exploration. The coastal environment is under increasing pressure from human activity and conflicting user demands. Coastal planning and management based on sound principles of sustainability can help to resolve these conflicts and mitigate the impacts of our reliance on coastal resources.

Planning provides an opportunity to coordinate and integrate a range of community and agency activities and to obtain implementation commitments and actions through an inclusive and collaborative process. Development, recreation and industry pressures on the coast can be managed through the formulation of regional, district and local plans, leading to more sustainable use in the future. Coastal planning strategies provide a framework for the development of land use planning and development decisions by communities as well as local, state and federal authorities. In addition to identifying and resolving coastal management issues, coastal strategies generally provide:

- Strategic planning guidance for the location of suitable land uses adjacent to the coast;
- Subdivision guidance for the scale, nature and form of development;
- Principles and objectives for the management of human usage, access and conflicts;
- Guidance for the location and siting of essential infrastructure and recreation facilities; and
- Mechanisms for the protection of environmental, cultural and heritage assets.

The coast of Western Australia is well covered by a range of planning instruments including regional strategies, structure plans and detailed coastal plans. However, plans always require review to ensure that they are suited to current planning needs. Many parts of the coast, while covered by relevant strategies, have not had more detailed coastal plans prepared to assist with the implementation of these strategies and day-to-day management.

1.2.1 State Planning

The State Planning Framework is set out in State Planning Policy No 1 and unites existing State and regional policies, strategies and guidelines within a central framework which provides a context for decision-making on land use and development in Western Australia. The planning framework informs the WA Planning Commission, local government and other stakeholders involved in the planning process on those aspects of State level planning policy that are to be taken into account, and given effect to, in order to ensure integrated decision-making across all spheres of planning.

State Planning Strategy

The intent of the State Planning Strategy is to provide a long-term, coordinated vision for land use planning in Western Australia. It highlights that in planning for the Central Region and the Midwest in particular, protection of coastal and marine environments is a priority.

State Planning Policy No. 2.6 State Coastal Planning Policy

SPP2.6 was gazetted in June 2003 and is the principal State government policy for coastal planning guidance in Western Australia. SPP2.6 provides appropriate measures for preparing local and regional planning strategies, structure plans, schemes, subdivisions, strata subdivisions and development applications. It also provides guidance for decisions and instruments relating to planning along the coast, and identifies the processes involved in the preparation of a coastal planning strategy and/or foreshore management plan.

A review of the SPP2.6 is underway and in May 2010 the WA Planning Commission endorsed a position statement for sea level rise in recognition of nationally accepted and adopted increases in sea level rise projections.

State Planning Policy No. 2.5 Agricultural and Rural Land Use Planning

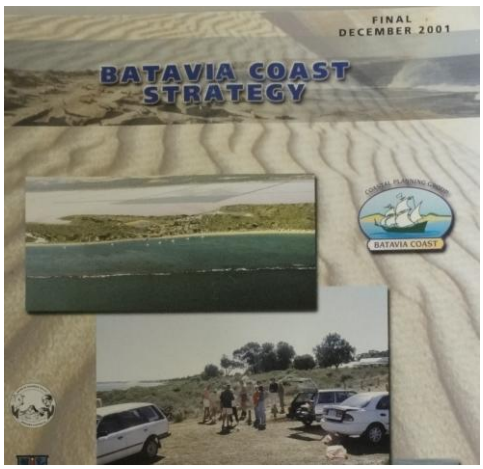
The aim of the SPP 2.5 is to ensure that: the State's priority agricultural land resource is protected; rural settlement opportunities are assessed and managed sustainably; land use conflicts are minimised; and the State's natural resources are adequately managed.

1.2.2 Regional Planning

Batavia Coast Strategy

The Batavia Coast Strategy provides a framework for coastal planning and management at a regional and local level for the area of coast between Kalbarri and Dongara in the Midwest region. The sectors identified in the Batavia Coast Strategy relevant to this Strategy are Greenough (sector C) and Cape Burney (sector D – The Greenough River mouth). The Batavia Coast Strategy identifies both Major Day Use and Minor Day Use Sites in the study area as follows:

> *Major Day Use Sites – These sites should continue to be managed and upgraded to ensure a high level of facilities, such as designated 2WD vehicle access, car parking areas, ablution facilities, shelters, precincts to demarcate and separate competing users (particularly off-road vehicles and pedestrians), information and signage, walk trails and designated off-road vehicle entry points, where appropriate.*
>
> Sites identified in the study area are Lucy's Beach and Flat Rocks.



Minor Day Use Sites – These are site on public land where access where access can be gained generally without the need to traverse private land. In some cases, however public access is only possible by off-rod vehicles along the beach and alternatively access through private property. Where demand for use increases or private landowners are unwilling to allow continued access, alternative arrangements may need to be secured. This may require creation of new road reserves and construction of access tracks or planned access from alternative points along the beach. A low level of development is recommended including planned public access by dedicated public access tracks or rationalised beach access and/or tracks.

Sites identified in the study area are Cape Burney, South Cape Burney, Devlins Pool (Blue Moonies), Ranches, Lucy's Surf Spot, Duncans Pool, The Spot, Dhus Rock, Twomeys and Headbutts.

1.2.3 Local Planning

Local Planning Strategy (Greenough)

The purpose of this document is to provide a strategic direction for the former Shire of Greenough area in terms of land use planning and development to ensure the coordination of infrastructure and urban growth. It identifies the likely land uses that will be established and indicates the preferred location for these land uses over the next 15 years.

The study area is shown on the Strategy Plan Map as 'Rural' with the Westbank Estate shown as 'Rural Residential'. The coastal dunes are identified on the Map as having 'Environmental Value'. The 'Central Greenough Heritage Area Boundary' runs from the Brand Highway 'S Bend' north to Westbank and includes a portion of the coastal plain referred to as the 'Front Flats' area.

The Local Planning Strategy identifies the soils of the Greenough Flats as being highly productive for agricultural pursuits and is subject to encroachment from the growth of Geraldton, thus further subdivision needs to be avoided.

The Local Planning Strategy highlights that previous investigations of the stability of the coastal dune areas south of the Greenough River mouth indicated that there are two areas that are more stable than the majority of the dunes and may be capable of development for uses other than rural. These areas are at Westbank and in the vicinity of Flat Rocks. The appropriate future use for Flat Rocks needs to be determined as part of more detailed coastal planning for this coastline.

The Local Planning Strategy acknowledges the potential for some form of more intensive land use and development centred on Flat Rocks. Any proposal for this area will need to have regard for the character and landscape values of the area, coastal and land management considerations, including bush fire risk, and infrastructure and service requirements. This area will need to be clearly distinguished from surrounding coastal land, both spatially and in the Town Planning Scheme, with specific zoning and development controls. Any proposals for this area will also need to address the recommendations of the Batavia Coast Coastal Planning Strategy,

(which identifies Flat Rocks as a major day use area).

The Flat Rocks area is described in the Local Planning Strategy as one of the best surfing spots in Western Australia and also has good fishing and other coastal attractions. The area is presently undeveloped and there may be an opportunity for a tourist development at this location if compatible with strategic planning for the coastline.

Local Rural Strategy (Greenough)

This Rural Strategy guides future land use and subdivision decisions for rural areas. The agricultural areas are divided into six precincts based on the natural land units.

Three areas are shown as 'Other Areas' (Westbank, Reserve 7276 south of the Greenough River Mouth and Reserves 37333 and 8613 at Lucy's) on the Local Rural Strategy Map. Development provisions for these other areas are found in either the Local Planning Strategy or the Local Planning Scheme.

In general the coastal dunes are located in the 'Quindalup Dunes' precinct. The precinct has little potential for agriculture and parts of the precinct (particularly in the southern section) have conservation values. Potential land uses include conservation, recreation and tourism at Flat Rocks. The Rural Strategy provides guidance on subdivision for conservation/landscape protection purposes to a minimum of 60ha.

The coastal plain (containing the Front Flats) is located in the 'Greenough Plains' precinct. This precinct is characterised by broadacre grazing and cropping with some intensive agricultural activities. Potential land uses include intensive and extensive agriculture, recreation and tourism. The Rural Strategy provides guidance on subdivision for heritage conservation, intensive agriculture to a minimum of 40ha on the Front Flats and 10ha around the Greenough Hamlet.

City of Greater Geraldton Local Planning Scheme No. 5 (Greenough)

Local Planning Scheme No. 5 was gazetted in April 2010. The aims of the Scheme relevant to this Strategy are:

- To promote the sustainable use of rural land for agricultural purposes whilst accommodating other rural activities;
- To protect and enhance the environmental values and natural resources of the Scheme area and to promote ecologically sustainable land use and development; and
- To safeguard and enhance the character and amenity of the built and natural environment of the Scheme area.

The Scheme covers the study area (south of Town Planning Scheme No. 1A). The majority of land in the study area is zoned 'Rural'. This zone provides for extensive agricultural uses which contribute to the general wellbeing of the region and state and which are compatible with the capability of the land. Lot sizes in the 'Rural' zone are to be consistent with the Local Planning and Local Rural Strategies.

Westbank is zoned 'Rural Residential', which provides for the use of the land for residential purposes in a rural setting for alternative rural residential lifestyle while preserving the amenity of such areas, ensure landscape protection and

conservation and controlling land use impacts. The minimum lot size is 1 – 4ha and certain land management issues need to be addressed for development approval to be granted.

The land abutting the Greenough River (to Westbank) and the land abutting the coast is a Local Scheme Reserve for the purpose of 'Parks and Recreation'.

Portions of the Front Flats are within the 'Greenough Heritage Special Control Area' where the purpose is to conserve and enhance the overall heritage values and landscape character of the area.

In terms of land uses, the Scheme entertains uses such as Agriculture Extensive and Intensive, Bed and Breakfast, Holiday Home, Cottage Industry, Private Recreation, Rural Pursuit and a Single House. Other tourist related land uses such as Tourism Development, Caravan Park, Hotel, Motel and Restaurant are not permitted in the 'Rural', 'Rural Smallholding' or 'Rural Residential' zones and would need a scheme amendment to allow for these uses to take place.

With regard to use within a 'Local Scheme Reserve', the local government in making a decision to develop a reserve, will have due regard for the intended use of the reserve.

City of Greater Geraldton Town Planning Scheme No. 1A (Greenough River Resort)

The City of Greater Geraldton Town Planning Scheme No. 1A was gazetted in May 1986 and covers the northern portion of the study area that abuts the Greenough River. The area is covered by two 'Local Scheme Reserves', Dune Preservation and Parks and Recreation. Land uses will be considered by the local government based on the intended use of the reserve.

Guidelines for Rural Development South of the Greenough River Mouth

Development and subdivision along the rural coastline is guided by the Guidelines for Rural Development South of the Greenough River Mouth. The general objective of this study is to provide a management framework for the development and use of the coastal lands and nearshore waters.

The guidelines cover issues such as land stability, recreation, access, coastal management, landscape protection and subdivision. In general, the guidelines do not support further subdivision of farming land along the coast and recommends that:

- The entire coastal strip be zoned appropriately for Dune Protection and Rural Residential;
- Subdivision in stable areas should be permitted for Rural Residential land use and subdivision should be in accordance with an approved subdivision plan and be subject to certain conditions;
- A foreshore management plan should be undertaken when Rural Residential development is undertaken; and
- No further subdivision should be permitted in the unstable parts of the coast.

Greenough Flats and Walkaway Land Use Strategy

Although adopted by the (former) Shire of Greenough in August 2001, this Strategy has not been endorsed by the WA Planning Commission and is now superseded by the Local Planning and Local Rural Strategies. However it is worth noting the land use and subdivision aspects.

The majority of the coastal dunes are located in Precinct No. 5 – Coastal Preservation. The intent of this Precinct is to protect the landscape values and landform attributes and preserve habitat and natural flora and fauna. It advocates subdivision to a minimum lot size of 40ha for conservation purposes and does not support rural residential subdivision or tourist uses.

Westbank and the Flat Rocks area are located in Precinct No. 6 – Rural Residential. The intent of this Precinct is to facilitate subdivision for rural living (subject to detailed planning and rezoning) on stable landforms.

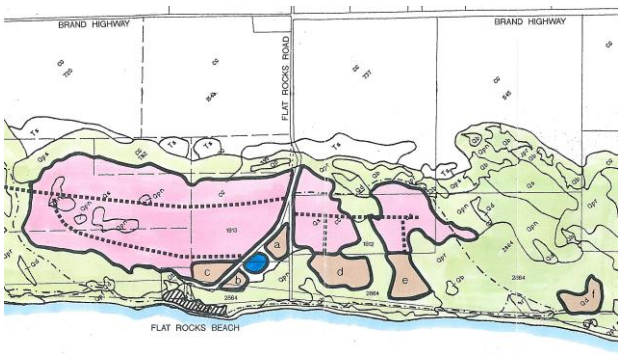
The majority of the coastal plain is located in Precinct No. 1 – Agriculture where the intent is to protect the land for agricultural purposes.

A small portion of the coastal plain near Westbank is located in Precinct No. 3 – Tourism where it is proposed to promote a mix of tourist accommodation and activities complementary with the agricultural landscape and historical significance of the area. It does not support the subdivision of agricultural land.

Flat Rocks Structure Plan

The broad objective of this Structure Plan (produced in 1997) was to set out a plan for the future land use allocation in the Flat Rocks area in an environmentally sustainable manner. The overall development concept was for a self-contained coastal node incorporating rural-residential, tourist and commercial development.

Given the age of this Structure Plan and the outcomes of this Strategy it will be necessary to update this Structure Plan prior to any development at Flat Rocks.



Local Planning Policies

The City of Greater Geraldton has over 30 policies dealing with various planning and development issues. Most relevant to this Strategy is the 'Low Impact Rural Tourism' policy.

This policy provides for incidental tourist accommodation in the rural areas in a manner that does not conflict with existing or potential agricultural pursuits. It establishes criteria for low impact tourist development in rural areas to ensure that the environmental attributes, landscape values and the visual and rural character and amenity of the municipality are not compromised.

The policy defines "Low Impact Tourist Developments" as including farmstay accommodation that encompasses chalets, cabins, guesthouse and bed & breakfast accommodation where occupation by any person is limited to a maximum of 3 months in any 12 month period. Development is generally of single storey or split level construction and has a character not dissimilar to farm dwellings.

The policy prescribes the maximum scale of development that can be accommodated on lots within the rural areas as no more than 3 chalets/cabins or a bed & breakfast facility or a 4 bedroom guest house which accommodates no more than 8 people (or other tourist facilities of similar land use intensity).

It further states that larger scaled developments and land uses will not be approved under this policy and will require, if found to be justified, an amendment to the Town/Local Planning Scheme to incorporate a site-specific zoning for the development proposed.

1.3 TECHNICAL REPORTS

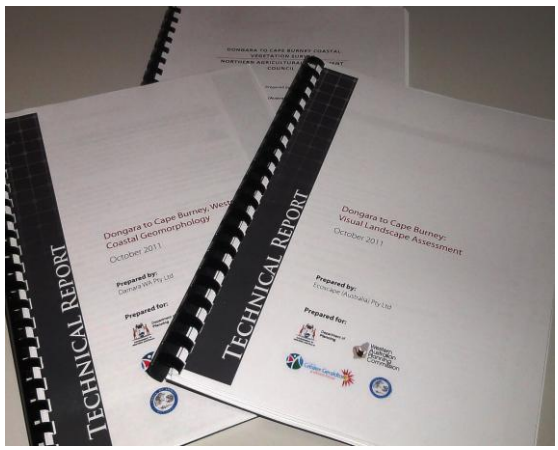
During 2009 and 2010 (as part of the Dongara to Cape Burney Coastal Strategy project) the preparation and collation of important background information, including technical reports, was undertaken. This required a detailed desktop review of previous studies carried out in the study area and the identification of further studies required to cover information gaps. These studies, undertaken by external consultants, included:

- The Dongara to Cape Burney, Western Australia: Coastal Geomorphology report describes the geomorphology of the coast between the northern limit of the Dongara townsite and the mouth of the Greenough River at Cape Burney south. This will assist to identify areas of relative instability including sections of the beach and dune system that are potentially subject to environmental change.

- The Dongara to Cape Burney: Visual Landscape Assessment aims to assess landscape features in order to develop landscape management objectives and design guidelines within the Dongara to Cape Burney area.

- The Dongara to Cape Burney Coastal Vegetation Survey aims to provide a regional context of native vegetation in the Greater Geraldton region to allow informed planning decisions to be made.

The Technical Reports are available from the WA Planning Commission's website (www.planning.wa.gov.au)



1.4 COMMUNITY CONSULTATION

The purpose of undertaking community consultation was to gain an understanding of community and key stakeholder responses to issues relating to future development and land use of the coast. The objectives of the community engagement process were to:

- Inform the community that a coastal planning strategy is being prepared;
- Determine community attitudes regarding current use of the coast;
- Establish community aspirations for the future of the coast;
- Gain information regarding key sites and issues;
- Provide the opportunity for a wide range of residents and stakeholders to have input in the planning process;
- Provide feedback to the community on the project; and
- Build capacity of local communities.

A combination of informative, interactive and facilitative engagement methods were used including on-line surveys and website, community workshops, mail drop and newsletters (see Appendix A).

1.4.1 On-line Survey and Website

The website was used as an evolving tool to relay up-to-date information on development of the Strategy to the community. The website allowed the community to download documents such as the project scope, the communications plan, workshop locations and times, and take part in the on-line survey.

Between August 2009 and January 2010 an online survey was conducted to determine the community's level, and area, of interest in being involved in the preparation of the Strategy. The survey also allowed the community to provide their opinions on the future of the area by providing their feedback on issues such as access, future development and coastal management. Responses to the survey questions totalled 50.

Survey participants stated that they were likely to participate in community engagement activities such as the on-line survey and read reports and documents on the website. Those who provided feedback via the website mainly have a landowner, holiday maker, fishing or off-road vehicle interest in the study area.

1.4.2 Community Workshops

Two sessions were held to consult with the communities and other interested groups and individuals to discuss the following questions:

- What do you value most about the Dongara/Cape Burney coast?
- What are the main issues that need addressing for the Dongara/Cape Burney coast?
- How would you like to see the Dongara/Cape Burney coast in 2030 (in terms of development, land use, conservation, etc.)?

The key outcomes of the workshops relevant to the Strategy are as follows:

Common Values	Common Issues	Participant's 'Vision' (2030)
Recreational use	Coastal access	Not much change
Landscape (features & beauty)	Building and managing development & population pressure	Limited development
Heritage (Aboriginal and European)	Facility provision	Increased coastal access
Solitude	Protection of cultural sites & heritage and environmental management	Conservation of the environment
Biodiversity	Inherent risks (associated with the local environment)	Protect biodiversity

Table 1: Key Outcomes of Community Workshops

Feedback was also sought relating to the following individual themes:

- Coastal management;
- Access;
- Current usage and recreational needs; and
- Future land use.

Limited access to beaches and controlled management of off-road vehicles were issues of concern. Most respondents were in favour of mixed access (2WD, 4WD, pedestrian and cycle) with several pointing out that this should be in a controlled manner. Tourism was favoured as the most acceptable future land use, with development on low and sustainable scales. There was no clear agreement from respondents on the most appropriate locations for development.

1.4.3 Other Consultation

Community members also emailed and telephoned members of the Dongara to Cape Burney Steering Committee. Some landholders also provided the Steering Committee with concept plans of their ideas for land use in the study area.

A key theme that arose in this consultation was that the community believed low scale, low-key development in the study area would be beneficial for the management of informal coastal access and of the foreshore reserve.

City of Geraldton-Greenough Coastal Communities Study

Although not part of this process, a recent Coastal Communities Study was prepared by the Northern Agricultural Catchments Council and Beckwith Environmental Planning in May 2010. This study documented the values and opinions of a representative sample of people living within 3km of the coast in Geraldton-Greenough. Responses totaled 506. The Coastal Communities Survey also involved interviews with key coastal stakeholders from the tourism industry, businesses, local government, coast care groups, and development industry. The study has also been used to inform this Strategy.

1.5 REGIONAL CHARACTERISTICS

1.5.1 Biophysical Environment

Ecological Values

People value the ecology of an area in different ways. Some people value conservation and recreational activities, others value the economic benefits of tourism or agricultural use. Appropriate foreshore and land management is one of the most important ways of ensuring maintenance, protection and enhancement of ecological values for future sustainable use.

A positive community attitude is fostered by placing a high value on the environment and its ecology. Encouraging community participation in coastal planning and management gives the community a sense of ownership of the area and the community will in turn want to protect the cultural and ecological significance of their coastline and adjacent land. Actively engaging the community in coastal planning and management will also ensure the values and assets are passed on to future generations.

Through all the surveys, workshops and studies completed as part of the Dongara to Cape Burney Coastal Strategy, a common list of threats to the ecological values of the study area emerge.

Priority Threats:

- Clearing and fragmentation
- Coastal erosion
- All terrain vehicles and motorbikes on dunes
- Cars on beaches
- New coastal development
- Poor land management
- Unmanaged access
- Grazing pressure
- Exotic weeds
- Feral animals
- Population growth (a multiplier for all the other threats)
- Climate change (linked to increased erosion and water availability)

Other Threats:

- Changed fire regimes
- Agricultural nutrients and contaminants
- Changed hydrology
- Not enough tourism development and lack of facilities
- Litter/rubbish dumping
- Stormwater runoff from urban areas
- Recreational activities such as fishing and surfing
- Mining of lime sands
- Destruction of Aboriginal sites
- Camping
- Disease

Climate

The climate in the study area is characterised as Mediterranean, with hot, dry summers, and cool, wet winters. The climate of the region is strongly influenced by a band of high pressure known as the sub-tropical ridge which is located south of Geraldton for much of the year, which results in prevailing easterly winds. Hot summer days are largely the result of these north-easterly winds blowing hot dry air from the interior of the state; however, these are often moderated by south to south-westerly afternoon sea breezes. The mean annual rainfall is approximately 460mm across an average of 80 days throughout the year.

The State of the Environment Report: Western Australia (2007) states that the impacts of climate change will be substantial, including accelerated loss of biodiversity, changes to economic productivity and the availability of water supplies, and hence people's lifestyles. The Climate Change Risks to Australia's Coasts Report (2009) reaffirms that many coastal areas in Australia, and particularly in Western Australia, are already and will increasingly experience accelerated coastal erosion due to rising sea levels. The Report also states that understanding both the short and long-term implications of these impacts is needed to inform adaptation planning.

Geology

For the development of this Strategy, the geology of the region is described in the Coastal Geomorphology Technical Report.

The Study area falls within the Perth Basin, a deep trough nearly 1,000m long, containing mainly sedimentary rock. The Abrolhos sub-basin lies to the west of the study area and forms the offshore reef systems that are evident in the southern portion of the study area. The Greenough Alluvium Flats are eroded plains that have been infilled by flood events with alluvial deposits. The Quindalup Dune System adjoins the Greenough Alluvium Flats to the west and abuts the entire coastline of the study area. The dune system is characterised by Calcareous deep and shallow sand and makes up the foredunes, deflation plains, swales, blowouts and parabolic dunes in the study area. The Tamala System consists of calcarenite, kankar and quartz sands and is associated with leached sands formed over limestone.

Hydrology

The Greenough River is the main river system in the study area and is located within the Greenough River Basin. Surface drainage in the area is seasonal, with peak flows occurring between July and August. The Greenough River starts in Yalgoo, approximately 240km north of Geraldton, and runs through the top third of the study area, meeting the Indian Ocean at Cape Burney. The Greenough River is a regionally significant waterway in terms of biodiversity, habitat provision, aesthetic values, cultural values and recreation in the Mid West region. The low relief of the Greenough River makes flooding a concern during high rainfall events.

Fauna

The fauna of the study area is typical of that found in the coastal sections of the Geraldton Sandplains bioregion. Many of the medium weight range mammals have become locally extinct as a result of introduced predators. More commonly seen mammal species include the grey kangaroo, echidna and dunnart. As a result of predation and clearing, many bird species have also suffered declines. The beach zone of the area also hosts a range of migratory wader species and marine birds. The Australian Sea Lion has also been observed on the beaches within the study area. The area has a high diversity of reptiles and frogs, with the sand swimming skinks being particularly diverse. Relatively little is known of the invertebrate species of the area, however, the variety of vegetation types in the area would be expected to host a wide range of species.

Marine Vegetation

The study area contains a high diversity of seagrass species and macroalgal communities. Local habitats such as limestone pavements, sand sheets and reef support seagrass and macroalgal growth. Major seagrass species surveyed in the area include *Amphibolis griffithii, A. antarctica, Posidonia sinuosa* and *P. australis*.

1.5.2 Coastal Geomorphology

Metocean Processes

The Dongara to Cape Burney coast faces southwest into the prevailing swell waves of the region. The reef topography controls the coastal processes through its effect on wave refraction and shoaling, and by structurally supporting the modern beach sands overlying its landward extension beneath the beach and dunes. The shore is comprised of steep, narrow sandy beaches alternating with rocky coast. The sea breezes and storm winds are significant for determination of the local wind-wave regime, set-up of water levels (surge) and mobilisation of the coastal sand dunes.

Wave buoys located offshore from Dongara and Geraldton have recorded wave data since 1993. Swell waves generated in the southern Indian Ocean combine with locally generated wind-waves to determine the regional wave regime. Wave heights in the area vary with the season and geographic location along the shore. During summer, wave heights range between 0.5m and 3.0m, and in winter from 0.5m to over 4.0m.

The region experiences predominantly diurnal tides, with a microtidal spring-tide range of 1.3m. High surge conditions related to mid-latitude storms and other extreme events may combine with high tides and wave activity to induce substantial beach responses and lead to destabilisation of the coastal dunes, especially along the more exposed sections of shore.

Compartments and Sediment Cells

The analysis (conducted as part of the Coastal Geomorphology Technical Report) of the broad-scale stability and susceptibility (vulnerability) of the coast between Dongara and Cape Burney, identifies landforms susceptible to environmental change and subsequently assists decision-making regarding the location of any proposed coastal development. An examination of the coastal geomorphology, associated landform assemblages as well as meteorological and oceanographic (metocean) processes was conducted for the coast between Dongara and Cape Burney providing information relevant for the development of this Strategy.

The coastal geomorphology report identifies broad structural components of the coast (sediment compartments) that are characterised by a common geological framework and smaller functional units (sediment cells) associated with the movement of sediment within each compartment. Compartments and Sediment Cells within the study area are illustrated in Figure 2 of the Coastal Geomorphology Technical Report. The two major landforms within the Strategy's study area are the Headbutts to Phillips Road (Compartment 3) and the Phillips Road to Cape Burney South (Compartment 4).

An indicative scoring system was developed for five levels of landform stability and sensitivity to change (see Table 5 of the Coastal Geomorphology Technical Report). Recommendations pertaining to the coastal compartment and sediment cells are listed in Section 7.2 of the Coastal Geomorphology Technical Report.

1.5.3 Vegetation

A vegetation survey was conducted as part of the Vegetation Survey Technical Report to gain a better understanding of the vegetation associations and vegetation conditions along the Dongara to Cape Burney coastline. The report of the survey also identifies areas of conservation significance and provides a regional context for decision-making in relation to development proposals that may impact on existing native vegetation.

The survey covered 6,394.45ha of native vegetation along the coastal strip between Dongara and Cape Burney. Nine vegetation communities were mapped using a combination of statistical analysis of floristic quadrats and visual assessment. A total of 122 taxa were identified from 25 quadrats. The vegetation of the Dongara to Cape Burney study area was mostly considered to be floristically similar to that found in the coastal areas of the Geraldton Regional Flora and Vegetation Survey.

The report identified that increasing development and recreational pressures are likely to have irreversible impacts on the study area's fragile ecosystems. If not adequately managed, recreational activities such as camping, surfing and fishing have the potential to damage the coastal environment through soil erosion, increased fire risks, fauna deaths, feral animals and weed invasion.

Nine plant communities have been identified in the study area being:

Community 1	Riparian Eucalyptus camaldulensis low woodland or forest.
Community 2	Estuarine Casuarina obesa open woodland over Tecticornia spp. samphire shrubland.
Community 3	Foredune and Primary Dune Atriplex and Scaevola shrubland and Spinifex tussock grassland.
Community 4	Foredune Nitraria billardierei open shrubland.
Community 5	Low Coastal Scaevola, Rhagodia, Templetonia and Alyxia open shrubland.
Community 6	Coastal Thryptomene baeckeacea heathland from near Cape Burney.
Community 7	Taller Dune Slope Acacia rostellifera, Alyxia buxifolia, Melaleuca deoressa and Templetonia retusa shrubland.
Community 8	Dune Swale and Greenough Alluvial Flats Melaleuca Forest or tall shrubland.
Community 9	Mallee Eucalyptus obtusiflora and Eucalyptus oraria.

The vegetation report provides a preliminary hierarchy of conservation priorities and the location of the conservation priorities have been mapped. The identified conservation priorities are:

- Significant Beard Vegetation associations (regionally and local significant)
- Plant communities with restricted extent (Plant community 1, 2, 3, 4, 6, 8 and 9)
- Plant communities with significant ecological function (Plant community 2, 3 and 4)
- Areas of vegetation in very good condition.

Four areas have been identified as having the highest priority as conservation significance intersects. These areas are:

- Along the Greenough River opposite Devlin Pool Road in plant community 2 Estuarine Casuarina obesa open woodland over Tecticornia spp. samphire shrubland;
- Areas adjacent to plant community 2 Estuarine Casuarina obesa open woodland over Tecticornia spp. samphire shrubland near Greenough River and plant community 8 Melaluca forest or tall shrubland;
- Near Cape Burney in plant communities 3 Foredune and primarly dune Atriplex/Scaevola shrubland and 6 Coastal Thryptomene baeckeacea heathland; and
- Areas with primary dune vegetation as the plant communities have a restricted extent and significant ecological function.

1.5.4 Heritage

Aboriginal Heritage

For more than 45,000 years, Aboriginal people have left signs of their occupation in the Midwest region including the study area. The region is home to many different groups of Aboriginal people. Collectively, the region's Aboriginal population is known as Yamaji People in the northern portion of the study area and Noongar People in the southern portion. The main language group is Amangu.

The *Aboriginal Heritage Act 1972* provides automatic protection for all places and objects in Western Australia that are important to Aboriginal people because of connections to their culture. These places and objects are referred to as Aboriginal sites. The study area contains 19 sites listed on the Department of Indigenous Affairs Aboriginal Heritage Enquiry System.

Under section 17 of the *Aboriginal Heritage Act 1972* it is an offence to knowingly disturb or destroy an Aboriginal site without the expressed consent of the Minister of Indigenous Affairs, which can be applied for under section 18 of the *Aboriginal Heritage Act 1972*. Disturbance commonly arises through development processes that impact the land on which a site is located.

Native Title

Native title is the recognition in Australian Law that Indigenous people continue to hold rights to land and water where a connection to their traditional laws and customs still exists. Native title may exist on Unallocated Crown Land, reserve land

or water bodies that are not privately owned. Native title rights are not recognised on residential freehold, farms held in freehold, residential, commercial, or community purpose leases, and public works such as roads.

There are 3 registered native title claims in the study area: the Mullewa Wadjari Community (WG6119/98), Amangu People (WAD6002/04) and Naaguja Peoples (WG6194/98).

European Heritage

It is thought that the Dutch were the first Europeans to make their mark on the Midwest coast with their ship Batavia wrecked at the Abrolhos in 1629. English settlement of the region commenced in the 1800s. In 1846, several early explorers and surveyors including Robert Austin and Augustus and Francis Gregory, pioneered pastoralism and agriculture, as well as mining industries from the Irwin and Murchison Rivers. Agricultural land for wheat, oats, barley and hay was established along the Greenough Flats between 1853 and 1857.

The Greenough flats are zoned in Local Planning Scheme No. 5 as a Special Control Area for its distinct heritage character and value. Although many of the heritage listed sites are east of the study area, these sites still need to be taken into consideration when planning for development. Greenough Historic Site is a well know heritage site with many heritage listed properties. Local Planning Scheme No. 5 also has the zoning provision 'Civic and Cultural' for heritage sites.

1.5.5 Visual Landscape

The western portion of the study area comprises a 2km wide coastal dune ridge that runs parallel to the coast, while the remainder lies within the adjoining flat or gently undulating coastal plain, also parallel to the coast. The dunes remain primarily in their natural state with coastal heath and scrub plant communities and some small eucalypt woodlands in sheltered locations on the eastern side. The boundary between the coastal dunes and the coastal plain is very abrupt with a steep dune face adjoining the coastal plain. The two landscape units contrast with each other markedly in terms of both topography and land use, as the coastal plain is cleared for agriculture. The greatest contrast is observed adjacent to the floodplain of the Greenough River where the dune face is relatively steep and the adjoining coastal plain is flat, with almost no remnant vegetation or structures.

The findings of the Visual Landscape Assessment Technical Report have been integrated in the development of the Strategy. The Assessment describes landscape character and viewing experiences, and proposes a series of strategies for managing landscape character and views.

The Assessment reveals that several of the study area's landscape and viewing experiences are significant at a regional and/or state level, as they are uncommon or have unique aspects.

Greenough River Mouth

The final section of the Greenough River before it reaches the sea flows through a natural dune system. Comparable landscapes exist north of Perth at the lower reaches of Moore River at Guilderton. Like Moore River, the Greenough River only has development on its north bank, close to its mouth. This means that views from the settlement are across the river to the naturally vegetated dunes. Users of the lower reaches of the river would be enclosed within a natural view shed once they passed upstream from the settlement. On the basis of similar landscapes being scarce in the region, it is concluded that the Greenough River is at least of regional significance for its landscape character.

Heritage Structures

A second feature of significance in the study area's landscape is the visually prominent heritage buildings, located both within and immediately adjacent to the study area. These buildings have a visual coherence, all being constructed of the same materials and roughly from the same time period when the Greenough Flats were in their 'hay day', the mid 1800's. The rich orange tones of the local stone and mortar used for these buildings contrast strongly with the yellows and greens of pastures and the dark greens of the native vegetation on the dunes.

Continuous, Unobstructed Views from the Highway to the Dune System

The experience of travelling parallel and close to a major landform feature for some distance is highly valued. Examples include the South West Highway along the base of the Darling Scarp south of Perth, Moresby Range from North West Coastal Highway, and in various parts around the State's coast where there is a distinctive ridge long the coastline (e.g. Caves Road along the Leeuwin-Naturaliste ridge and Lower Denmark Road west of Albany).

The example within the study area is unusual in several respects. First, the close proximity of the Brand Highway and Company Road to the dune system (less than 1km) and second, the stark contrast in topography and land use between the flat, treeless, pastures and cropped areas of the foreground coastal plain and the steep, vegetated dune ridge backdrop. Added to this mix is a series of mostly historic homes and associated planted vegetation dotted along the base of the dune ridge.

Site plans for two coastal nodes within the study area have been developed for Lucy's Beach and Flat Rocks (see Appendix B). The visual management objective for the coastal nodes is restoration and enhancement of visual character to improve the amenity and facilities for recreational purposes. 'Blending' is the more specific design objective for development, by borrowing the visual elements from the surrounding landscape.

1.5.6 Land Use

The coast is characterised by small sandy embayments, rocky platforms and active dune blowouts. It is mainly used for recreational activities such as fishing and surfing. The dunes are partially to fully vegetated in some areas, while others have been cleared, seasonally grazed or severely damaged by off-road vehicle activities.

The major land use on the coastal flats is agriculture including grain and hay production, and grazing. Larger swales along the coast have been cleared and are used for grazing.

Agriculture

The land of greatest agricultural value are the 'flats', where agricultural production is dominated by extensive areas of cropping and grazing and small areas of horticultural production on soils where water supplies are favourable. The 'flats' are considered high quality agricultural land and it is preferable to direct non-agricultural land uses away from high quality agricultural land to poorer country.

The 'flats' consist predominately of hard cracking clays and self-mulching clays with small areas of red loamy sands. The main constraints to agricultural land uses on the 'flats' are the risk of flooding, water logging and water erosion (see Appendix C for flood mapping).

Grazing occurs on these soils often as an adjunct to cropping. Livestock includes both sheep and cattle. Property owners make use of the dune vegetation along the coastline.

However, production on these soils is low and the risk of wind erosion is high. As with dryland cropping, grazing is not viable on small lots.

Horticulture

Horticulture is a small industry but growing in importance. While viable farm holdings for horticultural enterprises are usually smaller than for dry land cropping, horticultural enterprises need to be flexible and larger lot sizes are preferable. The viability of horticulture is very sensitive to such factors as crop type, demand, market price and stability, cost of inputs such as water, etc. These factors are subject to significant fluctuation and as such, growers need sufficient land to be able to adapt.

Analysis by the Department of Agriculture and Food indicates a sufficient number of smaller lots available in the Geraldton region to satisfy demand. The demand from investors in horticultural enterprises has been for larger property sizes with suitable soils and water.

The subdivision of rural land into progressively smaller lot sizes tends to destroy the capacities for diverse and viable agricultural production. Productivity correlates with soil type, climate and water availability; although many agricultural land uses do not require areas of productive land. The potential for diversity and total productive capacity is, nevertheless, enhanced by larger lot sizes.

The Department of Agriculture and Food does not support further subdivision of rural zone lots for agricultural purposes as industry trends are towards larger production units. If land is required for any other developments (urban/industrial/rural residential) then it would be preferable to use less productive soil types on the cleared portions of the coastal dunes or other land outside the planning area.

Tourism and Recreation

Recreation and tourism is a key land use in the study area. It will play a critical role in determining how the area develops in the future in terms of access and land use change.

In October 2009, Tourism WA undertook a visitor survey at key tourism sites along the Dongara – Cape Burney coast (see Appendix D).

Tourism WA staff visited Flat Rocks, Nine Mile Beach, Seven Mile Beach, Devlins Pool, Cape Burney and Lucy's Beach to conduct the interviews. Half of the interviews took place at Cape Burney, 12 at Flat Rocks, 6 at Seven Mile Beach, 3 at Nine Mile beach and no interviews were conducted at the reminder of the sites. Visitors to the area were predominantly on a day trip while the remainder were visiting the area for a longer period. The data illustrates that visitors tend to access the coast at various points in the study area in the same trip. For example, visitors will take in Lucy's Beach and Flat Rocks in the same visit.

Approximately 29% of visitors surveyed were attracted to the area for fishing and 27% for surfing. Swimming, off-road driving and hiking/walking were also popular recreational activities. Over 60% of interviewees would like to see the area retained in its current state with additional access and an upgrade and provision of facilities.

Approximately half of all interviewees were living locally as 'home' was their accommodation choice, and 31% were staying in a caravan park. Interviewees were also camping, staying with friends or in a holiday home.

It is envisaged that with predicted growth of the Midwest region, recreational users to the area will also increase. The key recreation issues associated with management of the coastal area are:

- Lack of access to the study area as a whole; only three formal access roads exist;
- The requirement for improved conservation of the coastal dunes;
- Requirement for coastal foreshore reserves and foreshore management plans to be created with any future development;
- The need for additional facilities and upgrade of existing facilities;

- Management of informal camping; and
- Management of 4WDriving on private land and public land.

Recreational Requirements

Recreation along the Dongara to Cape Burney coast is becoming increasingly popular. The anticipated growth of the Midwest region will bring more visitors to this stretch of coastline. The inshore marine environment provides recreational opportunities such as camping, fishing, snorkelling and diving, surfing, swimming and off-road driving. Accessibility to the coast determines the popularity of recreational nodes along this stretch of coast. Table 2 displays the recreational nodes along the study area's coast (see Figure 4).

Recreation Sites in the Study Area (City of Greater Geraldton)	Camping	Diving/Snorkelling	Surfing	Recreational Fishing	Off-road Vehicle use/access	Swimming	Constructed Parking and Access	Toilet Facilities	Boat Launching
Headbutts - minor	■		■	■	■				
Twomeys - minor	■		■	■	■				
Dhus Rocks - minor	■			■	■				
Flat Rocks - major	■	■	■	■	■		■	■	■
The Spot - minor	■		■	■	■				
Lucy's Beach - major	■		■	■	■				
Ranches - minor			■	■	■				
Devlin Pool (Blue Moonies) - minor			■	■	■				
South Cape Burney - minor		■	■	■	■				

Table 2: Recreation Sites and Activities

The increasing demand for recreational activities will result in a greater level of informal access to these beaches. Uncontrolled tourism and recreation, including recreational fishing, off-road vehicle use, camping and surfing has a high potential to cause damage to the environment such as:

- Soil erosion due to off-road vehicle use and unrestricted track access through foredunes.
- Damage to vegetation by vehicle use and clearing for campsites.
- Fire damage from camp fires, discarded cigarettes and deliberate arson.
- Rubbish dumped from campsite users and fishing parties, including discarded fishing lines.
- Feral animals attracted to discarded rubbish and fish wastes.
- Fauna deaths from vehicle impact.
- Weed invasion and spread of seed due to soil disturbances from vehicles.

There are many land management issues that are associated with coastal recreation. These include key matters such as:

- Formal and informal access to recreational nodes to reduce environmental degradation from activities such as off-road driving.
- Conservation of landscape features (e.g. dunes), vegetation and fauna.
- Establishing appropriate setbacks for future developments.
- Identifying suitable locations for additional facilities within recreational nodes.
- Management of informal camping and accommodation in recreational areas.
- Overcrowding of some recreation and camping sites.
- Lack of foreshore management in recreational areas.
- Large areas of the coast where landholdings extend to the high water mark.

It is important that all recreational activity sites and associated infrastructure, facilities and public access tracks, both 2WD and 4WD, are in public ownership. This will allow for controlled and formal management of the area and will reduce the potential of damage to the surrounding environment. It will also take liability away from the private landowner.

Coastal Access

Access is a significant issue along this stretch of coast. The coastal access roads are of non-uniform standard and coastal nodes are driving the growth of informal access routes across private freehold land. Most of these informal tracks are traversable only in 4WD vehicles. Flat Rocks and Lucy's Beach are the only recreational coastal sites available for 2WD access within the study area.

A narrow area of Unallocated Crown Land exists between most property boundaries and the high water mark. However, in some cases properties extend to the high water mark. This may have implications for providing formal coastal access. As such, it is recommended that an appropriate coastal foreshore reserve be identified for the entire area and be ceded to the crown free of cost when/if planning opportunity arises.

The Batavia Coast Strategy does not recommend restricting off-road vehicle access to this coastline where vehicles are accessing coastal nodes. The Batavia Coast Strategy recommends that access tracks be designated and managed to protect coastal environments and minimise public safety risks.

Flat Rocks and Lucy's Beach are the two coastal nodes in the City of Greater Geraldton with formal vehicle access. Flat Rocks is accessed from the Brand Highway via Flat Rocks Road and Lucy's Beach from Brand Highway via McCartney Road, then Lucy's Beach Road. The two nodes can also be accessed from pedestrian paths or from informal tracks from West Bank Road, Phillips Road and McCartney Road that link the Brand Highway to areas in close proximity to the beach.

The provision of well-planned additional coastal access, plus the rationalisation of existing tracks to the foreshore areas in the City of Greater Geraldton, is important for environmental preservation of the fragile dune environment. Currently, informal access though private property to the beach is causing dune blowouts, sand drift and vegetation degradation, especially in the Headbutts vicinity. Also continued public access through private properties could result in risk to public safety and legal issues.

2 PART II: STRATEGY

2.1 Principles and Objectives

2.1.1 Scope

The *South Greenough to Cape Burney Coastal Strategy* has been commissioned by the City of Greater Geraldton using the background and technical information gathered for the development of the Dongara to Cape Burney to Coastal Strategy.

The Strategy addresses both Planning and Management actions. The purpose of Part II is to provide a strategic planning framework that guides future decision-making about land use, development and subdivision to ensure the protection of significant environmental assets, coastal systems and community values of the coastline.

2.1.2 Guiding Principles

These principles have been distilled from a combination of technical reports, existing policy documents and community engagement in the local area. These principles will guide future decisions on planning and management in the study area.

Environment principle:

- To conserve and enhance the natural environment, biological diversity and distinctive landscape of the coast.

Community development principles:

- To enhance the area as a place to live and visit, promote low key and low-scale development that complements the landscape of the area, and encourage a range of tourism accommodation options.

- To provide appropriate access to the coast that reduces human impact to the fragile coastal environment.

Economic development principle:

- To enable the economic potential of appropriate tourism and agriculture production of the coast through future planned land use change.

2.1.3 Local Vision

The local vision has been developed by the Steering Committee, informed by the outcomes of community engagement. This aligns with the broader vision for the City of Greater Geraldton articulated in the 'Strategic Community Plan' and the '2029 and Beyond Community Charter'.

The community will continue to enjoy the unique landscape features and recreational opportunities the area has to offer by:

- *Ensuring preservation of key environmental attributes and ecosystem functions;*
- *Providing more formalised access to the coast; and*
- *Planning for sustainable, low-key development that complements existing natural, rural and built elements of the landscape.*

2.1.4 Key Objectives

The principles and vision have implications for specific aspects of planning, development and management. The following key objectives are intended to guide land use, development and subdivision decision making.

1. **Land Use:** Enhance the biological diversity, agricultural productivity and distinctive character of the landscape.

2. **Built Environment:** Increase the range of appropriately sited rural accommodation and formalised access to the coast.

3. **Heritage:** Recognise, promote and protect the Aboriginal, European and Geological history.

4. **Visual Landscape:** Maintain the key views, skyline and rural character through appropriate siting, materials, form and colour of infrastructure.

5. **Coastal Geomorphology:** Implement development and management that maintains landform stability and minimises vulnerability to change.

6. **Agriculture:** Maintain the availability of larger lots on productive soil by deterring subdivision and directing non-agricultural land uses onto poorer quality land outside of the study area.

7. **Fire Management:** Minimise bushfire hazard through siting of development and implementation of fire management plans.

8. **Water and Waste Management:** Avoid degradation or over use of water supplies and minimise production of waste.

9. **Tourism and Recreation:** Increase the sustainable visitor capacity of the area through enhanced access, facilities and low key accommodation.

2.2 Settlement and Coastal Tourism Hierarchy

The urban settlement of Geraldton is located to the north of the study area and is the regional centre of the Midwest. Geraldton is the focus of commercial and administrative services in the region. The best part of the local and visiting population to the study area would reside in Geraldton.

All large scale, high impact, residential and tourist resort type development should be located within the existing urban settlement of Geraldton. This is in compliance with various State Planning Policies and the general guidance gathered during community consultation.

2.2.1 Coastal Nodes

Planning, development and management will direct fishing, surfing, camping and other recreational activity towards coastal nodes. From the outcomes of the Technical Reports and community consultation, the following major and minor nodes are identified (see Figure 4).

Major Nodes	Minor Day Use Nodes
• Lucy's Beach (future) • Flat Rocks	• Cape Burney • South Cape Burney • Devlins Pool • Ranches • Lucy's Surf Spot • Duncan's Pool • The Spot • Dhus Rocks • Twomeys • Headbutts

Table 3: Coastal Nodes

2.2.2 Major Nodes

Major nodes should continue to be managed and upgraded to ensure a high level of facilities such as designated 2WD vehicle access, car parking areas, ablution facilities, shelters, precincts to demarcate and separate competing users, information and signage, walk trails and designated off-road entry points.

The major nodes of Lucy's Beach and Flat Rocks provide formal access to the coast. Flat Rocks has a car park, ablution blocks and a viewing platform for use during surf events. There are no facilities at Lucy's Beach.

Due to the existing level of services and infrastructure, overnight accommodation of a low to medium scale could potentially be developed in the immediate Flat Rocks vicinity (subject to further detailed structure planning). The areas around Lucy's Beach are not considered suitable for overnight accommodation due to primarily geomorphological and visual landscape constraints.

2.2.3 Minor Day Use Nodes

Minor day use nodes should provide for a lower level of facilities and access such as 4WD access through dedicated tracks or rationalised beach access. In some locations, low-scale parking, ablutions and shelters may be appropriate.

Currently, in many locations, informal access to the beach is through private property. Management of these access tracks should be considered part of any development applications.

2.2.4 Access

Provision of formal access to the coast will assist in reducing indiscriminate, illegal access and associated environmental degradation and management implications. Barriers should be placed to restrict access north or south of the coastal nodes to prevent vegetation damage and erosion.

It is envisaged that additional coastal access locations may be appropriate as part of low impact rural tourism proposals in appropriately located sites that satisfy setback requirements for physical processes, protection of environmental values and other land use, development and subdivision criteria referred to in Section 2.3.

The exact location of coastal access will be determined on the provision of a site plan that discusses the existing location of informal access tracks, beach and dune conditions, proposed strategies for the protection of the environment and visual landscape considerations.

The provision of public coastal access in the identified coastal nodes locations may be facilitated through subdivision. It is also likely that a more substantial foreshore reserve will be required to accommodate any infrastructure or amenity to accompany the access point and parking (if provided).

Proponents of development at these locations will be expected to provide the vehicle access and associated infrastructure (including, but not limited to car parking and vehicle management infrastructure, fencing and signage) all in accordance with an approved coastal management plan or the like.

2.3 Land Use, Development and Subdivision Guidelines

2.3.1 Planning Precincts

The subdivision and development guidelines are separated into two planning precincts (the Dune System and the Coastal Plain) based on the two dominant landscape features guided by soil mapping produced by the Department of Agriculture and Food. The use of cadastral lines as the basis for applying different criteria would not take into account any aspects of the land such as topography, soil type or vegetation.

The result is that some landholdings traverse both planning precinct areas. Therefore, it is intended that the planning precinct boundaries of the Dune System and the Coastal Plain be flexible to allow for consideration of the merits of an application rather than being a hard line of separation.

Discretion may be applied to land traversed or adjacent to these boundaries where assessment and determination can be guided by the vision and objectives of the Strategy. For landholdings that are clearly contained within a single planning precinct, subdivision will only be supported in accordance with the relevant criteria for either the Dune System or the Coastal Plain.

2.3.2 Dune System

The Dune System comprise 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 Dune System predominantly comprises native vegetation, although grazing has reduced the natural species diversity and has introduced weeds.

2.3.3 Dune System Land Use Guidelines

The following uses are considered appropriate subject to compliance with the relevant Local Planning Scheme, Council and WA Planning Commission policies:

- Conservation
- Heritage Protection/Conservation
- Industry Cottage
- Low Impact Rural Tourism
- Medium-Scale Tourism (at Flat Rocks)
- Recreation
- Recreation Private
- Rural Smallholdings (at Flat Rocks)

2.3.4 Dune System Development Guidelines

a) All development is to be either contained within a building envelope or not be located in a building exclusion area. A building envelope is to be shown where the amount of remnant vegetation or areas of instability restrict the location of development. Whereas a building exclusion area is to be used when a lot has some areas of remnant vegetation that should be protected or areas of instability that should be avoided and the remaining land is unencumbered in terms of development location.

b) Building envelopes should be located in cleared, stable areas so as to maximise remnant vegetation preservation.

c) A building envelope should be a maximum of 2,000m^2. Larger envelopes may be permitted to accommodate an existing dwelling and outbuilding(s) and alternatively smaller envelopes may be required in order to minimise clearing of remnant vegetation.

d) Building mass and scale should be reduced by developing a number of smaller buildings. Outbuildings should be clustered and form a unified group with the main building. Colours should be chosen from the colour swatches in the Visual Landscape Assessment Technical Report.

e) Development should be located at the base of the dunes and not be visible on the dune face (from the Brand Highway/Company Road) and no built from should be visible above the dune skyline from Brand Highway/Company Road or the coastline (except at identified medium-scale tourism locations).

f) Development should not detract from the identified key views in the Visual Landscape Assessment Technical Report. Building height should be restricted to 25m AHD.

g) Cut and fill methods which level out the landform are discouraged. Instead the natural contours of the land should be retained so development sits within the landscape. Roof pitch should align with the natural slope.

h) Vegetation should be retained on the dune ridgeline and skyline. Development should have vegetation (preferably native) screening and/or be nestled into the existing vegetation and into the folds of the landform.

i) Roads and access tacks should be designed to provide view corridors with ocean and coastal plain glimpses. They should follow the contours of the landform and be sited in the swales (not run directly over high points or ridgelines). Development should utilise existing accesses and rationalize unnecessary accesses (including access to the coast).

j) All fencing should be of an open and rural nature.

2.3.5 Dune System Subdivision Guidelines

The City MAY support subdivision in the following circumstances (subject to WA Planning Commission policy):

a) A foreshore reserve (where applicable) should be created with all subdivision and/or amalgamation proposals.

b) Boundary relocations where no additional lots are created.

c) Heritage places where subdivision can be shown as a mechanism to secure its conservation.

d) Conservation purposes where the lots proposed are not less than 20ha minimum and 40ha average, PROVIDED a conservation covenant in perpetuity with an authority acceptable to the WAPC is registered on the certificate of title for newly created lots. The restrictive covenant will protect and preserve remnant or regenerated vegetation in perpetuity and should include among other things, provisions for:

- Prohibit further clearing;
- Clearly delineate a building envelope and/or building exclusion area also shown on the subdivision plan;
- On-going weed management;
- Prohibit stocking;
- Rationalize existing accesses;
- Rehabilitate unstable/degraded areas with local provenance seedlings; and
- Coastal management.

e) An established project of tourist or recreational significance (at the coastal nodes).

f) Rural Smallholdings at Flat Rocks where the lots proposed are not less than 4ha, subject to detailed structure planning, land capability/suitability and appropriate rezoning.

2.3.6 Coastal Plain

Within the study area the Coastal Plain 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'. This area is dominated by floodplains featuring alluvial soils which has some of the more significant horticultural activity and some of the most productive broadacre land in the district.

2.3.7 Coastal Plain Land Use Guidelines

The following uses are considered appropriate subject to compliance with the relevant Local Planning Scheme, Council and WA Planning Commission policies:

- Agriculture Extensive
- Agriculture Intensive
- Conservation
- Heritage Protection/Conservation
- Industry Cottage
- Industry Rural
- Low Impact Rural Tourism
- Recreation
- Recreation Private
- Rural Pursuit

2.3.8 Coastal Plain Development Guidelines

a) Building mass and scale should be reduced by developing a number of smaller buildings. Outbuildings should be clustered and form a unified group with the main building. Colours should be chosen from the colour swatches in the Visual Landscape Assessment Technical Report.

b) Development should not detract from the identified key views in the Visual Landscape Assessment Technical Report. Building height should be restricted to 25m AHD.

c) Cut and fill methods which level out the landform are discouraged (unless required to establish minimum floor levels in the flood plain areas). Instead the natural contours of the land should be retained so development sits within the landscape. Roof pitch should align with the natural slope.

d) Vegetation should be retained.

e) Roads and access tacks should be designed to provide view corridors with coastal plain glimpses. They should follow the contours of the landform and be sited in the swales (not run directly over high points or ridgelines). Development should utilise existing accesses and rationalize unnecessary accesses (including access to the coast).

f) All fencing should be of an open and rural nature.

2.3.9 Coastal Plain Subdivision Guidelines

Council MAY support subdivision in the following circumstances (subject to WA Planning Commission policy):

a) Boundary relocations where no additional lots are created.

b) Heritage places where subdivision can be shown as a mechanism to secure its conservation.

c) Excisions of an established and sustainable rural industry and/or rural pursuit (e.g. vineyard, olive grove, grain storage facility) PROVIDED the balance of the land is not less than 40ha.

d) Continued extensive agriculture where the lots proposed are not less than 250ha;

e) Demonstrated long-term sustainable intensive agriculture

where the lots proposed are not less than 10ha AND the land is connected to a reticulated water supply.

2.3.10 Planning Approval

The planning approval of the local government is required for all development in both the Dunes System and the Coastal Plain planning precincts. Applications should identify relevant measures and actions that will meet the objectives of the Strategy and ensure each development contributes to the local vision. Applications should also address each relevant key objective and provide information and actions that will be taken to achieve the objectives.

- **Land Use** e.g. Vegetation condition, land capability, weed management, conservation covenants.
- **Built Environment** e.g. Building Envelopes/Building Exclusion Areas, location of fences and accessways.
- **Heritage** e.g. Aboriginal or European Heritage, geoheritage.
- **Visual Landscape** e.g. Siting, height, form and materials of buildings, fencing and roads to maintain visual amenity.
- **Coastal Geomorphology** e.g. Coastal stability, coastal setback and foreshore reserves.
- **Agriculture** e.g. Proposed areas for stocking, irrigation.
- **Fire Management** e.g. Bushfire hazard assessment and fire management plans.
- **Water and Waste Management** e.g. Water sensitive urban design and local water management strategies.
- **Tourism and Recreation** e.g. Access plan, coastal node infrastructure and management.

2.3.11 Revegetation Guidelines

For land within the Dunes System planning precinct there is the opportunity for revegetation and rehabilitation (utilising local indigenous species) to:

- Rehabilitate and expand existing areas of regionally significant vegetation;
- Rehabilitate and regenerate areas of degraded vegetation;
- Add to the high social and ecological values of the landscape;
- Establish ecological linkages across the area;
- Create habitat for native fauna; and
- Increase the quality of vegetation.

As a condition of subdivision, the local government will require revegetation or regeneration measures as follows:

- In areas that are mapped as having 'good', 'very good' or 'excellent' vegetation condition in the Coastal Vegetation Survey Technical Report (see Appendix E), a minimum of 1% of the lot area revegetated with a combination of trees, shrubs and ground covers consistent with the indigenous plant communities of the locale. This is in addition to existing vegetation;

- In areas that are mapped as having 'degraded' or 'completely degraded' vegetation condition in the Coastal Vegetation Survey Technical Report (see Appendix E), a minimum of 2% of the lot area revegetated with a combination of trees, shrubs and ground covers consistent with the indigenous plant communities of the locale. This is in addition to existing vegetation; and

- In all other areas, a minimum of 3% of the lot area revegetated with a combination of trees, shrubs and ground covers consistent with the indigenous plant communities of the locale. This is in addition to existing vegetation.

In some areas, the intended biodiversity outcomes may be better achieved through weed management and regeneration, or planting other forms of vegetation (shrubs or groundcovers) consistent with the indigenous plant communities of the locale.

Revegetation and rehabilitation should be prioritised in locations within the lot:

- To establish linkages with neighbouring areas of remnant vegetation, or a buffer around the perimeter of remnant vegetation;
- To regenerate or rehabilitate degraded vegetation to a higher quality; or
- To provide screening of development.

2.3.12 Cash-in-Lieu of Revegetation

It is acknowledged that there may be landowners more committed, skilled and resourced to undertake revegetation and rehabilitation and management. There also may be instances where more positive biodiversity outcomes can be achieved through revegetation and rehabilitation of selective areas.

In these instances and where landholders may not have the skills, resources, etc. to carry out revegetation the City may accept a cash contribution in lieu of revegetation. The Local Government Biodiversity Guidelines for the Perth Metropolitan Region (June 2004) provide estimates of the costs associated with undertaking certain management activities. To reconstruct, 'upland' areas (including weed control, seedling establishment, plant guards, watering in and replacement plantings) over a 5 year period is estimated to cost $10.50/m2. This is the figure used for calculating the cash-in-lieu contribution and may be revised from time to time by the City. Monies collected will be held in trust for use in achieving biodiversity outcomes within the study area.

3 PART III: MANAGEMENT

3.1 Management Goals

The overarching management goals for the study area are:

- To ensure the preservation of key environmental attributes and ecosystem functions;
- To provide, and encourage the use of, recreational facilities at key coastal nodes;
- To reduce areas of degradation caused by recreational use; and
- To ensure a consistent and joint approach to the protection and restoration of the coastal environment.

3.2 Management Recommendations

This management section aims to increase knowledge and awareness on current and potential land management issues impacting on the natural resources. It also encourages a more consistent use of best practice management techniques in order to minimise the impacts associated with the increasing development and recreational pressures.

3.2.1 Land Use

- Protect and rehabilitate foredune and primary dune vegetation through activities such as track rationalisation, track maintenance, planting native species, weeds removal, dune matting, fencing, bollards and directional signage.
- Monitor changes in the distribution, abundance and impact of invasive species to ensure management practices are adapted to minimise current/future impacts on local biodiversity.
- Prepare site-specific management plans for day use nodes to manage competing uses.
- Undertake on-going monitoring of the use of both formal and informal beach access tracks.
- Close informal tracks close to the beach and parallel with the shore and rehabilitate adjacent degraded areas.
- Identify accesses to beaches that are linked to sections of the coast stabilised by rock outcrops. Once identified, these tracks should then be fenced to protect the dunes and surrounding vegetation and vested in the council for maintenance. Rehabilitate all other tracks through private property.
- Private landowners to prepare coastal management plans that identify mitigation strategies for the protection and rehabilitation of coastal areas.

3.2.2 Built Environment

- Materials used should be consistent with and enhance or reflect the local character.
- Avoid the use of highly reflective or brightly coloured building materials that contrast with the surrounding landscape.
- Site buildings at low points of the dunes so that they do not interrupt the continuous nature of the dune skyline.
- Utlise vegetation screening.
- Built from should respond to the natural topography.

3.2.3 Heritage

- Minimise site disturbance and impact on heritage sites and provide interpretive signage where appropriate.
- Do not attempt to mimic heritage character but rather use contemporary design elements.

3.2.4 Visual Landscape

- Undertake on-going maintenance of existing facilities at day use nodes; consider the provision of new recreational facilities where needed. The character of the landscape should be reflected and maintained in any development.
- New roads, firebreaks, access tracks and other linear features should follow the contour of the landform and not be oriented towards the key view-sheds.
- Retain natural character where it currently exists and reduce visibility and potential visibility of recreation, tourism or other development nodes by containing their visibility to within their immediate view-shed and by retaining or re-introducing local native vegetation.

3.2.5 Coastal Geomorphology

- Establish and/or realign access tracks preferable through stable dunes perched on coastal limestone.
- Restrict coastal access and recreational activities in proximity to active blowouts.
- Erect signage to raise awareness of degradation issues and inform users about appropriate use of day use nodes.

3.2.6 Fire Management

- Develop site planning for day use nodes that consider opportunities for site layout and design to minimise fire events and their impacts.
- Undertake ongoing maintenance works for facilities and infrastructure installed at day use nodes (these may include frequent rubbish removal, fencing around brushed areas, not brushing adjacent to access ways, and the installation of gas rather than wood barbeques).
- Provide adequate buffers between coastal reserves and built structures that are at risk of fire damage.
- Improve community awareness through signage about potential sources of ignition, such as motorbikes in dry vegetation, and inappropriate activities, such as illegal campfires, and burning without a permit.

3.2.7 Water and Waste Management

- Plant local indigenous native species.
- Minimise the need for drainage outfalls to the coast and ensuring that the location and design of all structures minimises the impact on both physical and ecological processes and coastal amenity.

3.2.8 Tourism and Recreation

- Undertake on-going management and maintenance of major nodes to ensure a high level of facilities.
- Undertake on-going maintenance of access tracks to minor day use sites.
- Encourage users of the coast to use only designated off-road vehicle tracks in areas where they exist and discourage from accessing the coast where tracks have not been formalized and there are signs of erosion.

4 GLOSSARY OF TERMS

Agriculture Extensive means premises used for the raising of stock or crops but does not include agriculture intensive or feedlots.

Agriculture Intensive means premises used for trade or commercial purposes, including outbuildings and earthworks, associated with the following:

(a) the production of grapes, vegetables, flowers, exotic or native plants, or fruit or nuts;
(b) the establishment and operation of plant or fruit nurseries;
(c) the development of land for irrigated fodder production or irrigated pasture (including turf farms); or
(d) aquaculture.

Biodiversity means 'The variety of life forms – the different plants, animals and micro-organisms, the genes they contain, and the ecosystems they form', National Strategy for the Conservation of Australia's Biological Diversity (2010). In this case, the aim is to conserve the variety of species and vegetation communities in the area.

Coastal Compartment means the length of shoreline bounded by broad scale changes in geology, geomorphic structures/landforms or changes in the aspect of the shore.

Coastal or Foreshore Management Plan means a local scale plan designating areas for various purposes such as public access, car parks, toilets and providing advice on management needs. Foreshore management plans tend to deal with a smaller area, are more detailed and prepared as part of a planning approval process, ongoing maintenance or upgrading program.

Coastal Susceptibility means the susceptibility of the coast to change in the frequency and intensity of metocean processes according to the geological structure, regional to sub-regional scale landforms and landform patterns of discrete sections of the coast.

Conservation means the careful management of the natural resources and environment so to avoid, or at the very least, minimise change.

Day Use Site means sites that are generally associated with a feature, activity or interpretation focus, suited to short stays. The area is designated and managed to provide visitor amenities for day use only. It may include parking facilities, shade shelters, barbecues, toilets and picnic areas but does not cater for, or permit, overnight stays.

Ecological Linkages means connected areas of ecosystems (e.g. bushland) that enable movement of animals, exchange of genetic material between plants and ensure ecosystems are more resilient in the face of change.

Heritage Protection/Conservation means, in relation to any place, the management of that place in a manner that will:

(a) enable the cultural heritage significance of that place to be retained; and
(b) yield the greatest sustainable benefit for the present community without diminishing the cultural heritage significance of that place,

and may include the preservation, stabilization, protection, restoration, reconstruction, adaptation, and maintenance of that place in accordance with relevant professional standards, and the provision of an appropriate visual setting.

Hobby Farm means the partial or entire use of a small landholding for rural activities that provide and agricultural interest and or/additional income for the owner of the land.

Industry Cottage means a trade or light industry producing arts and crafts goods which does not fall within the definition of a home occupation and which:

(a) does not cause injury to or adversely affect the amenity of the neighbourhood;
(b) where operated in a residential zone, does not employ any person other than a member of the occupier's household;
(c) is conducted in an out-building which is compatible with the principal uses to which land in the zone in which it is located may be put;
(d) does not occupy an area in excess of 50m²; and
(e) does not display a sign exceeding 0.2m² in area.

Industry Rural means:

(a) an industry handling, treating, processing or packing rural products; or
(b) a workshop servicing plant or equipment used for rural purposes.

Low Impact Rural Tourism means the use and development of land, principally for tourist purposes, in such a manner that does not detract from the rural and natural amenity of the locality, and includes the following criteria:

(a) located to avoid ridge lines, escarpments or visually exposed sites and situated where vegetation or land form can be utilised for screening;
(b) sensitively located and designed to promote positive outcomes and positive environmental outcomes and minimise impact on vegetation, water courses, soil quality and existing land uses;
(c) will not cause a net loss of vegetation;
(d) scale and nature to be self sustaining on the land, or demonstrate the ability to provide servicing without significant modifications to existing infrastructure;
(e) the nature of its scale, design, colours, materials, landscaping and use has minimal visual impact on the site and surrounding areas; and
(f) minimal off-site environmental or social adverse impacts.

The maximum scale of development is restricted to no more than 3 chalets/cabins or a bed & breakfast facility or a 4 bedroom guest house which accommodates no more than 8 people (or other tourist facilities of similar land use intensity).

Medium-Scale Tourism means a range of tourist uses/development consistent with the rural ethos of the locality (e.g. café, caravan park, eco resort). Depending on the nature of the development it may require rezoning.

Recreation means the use of land for leisure purposes (e.g. fishing, swimming, bush walking, surfing).

Recreation Private means premises used for indoor or outdoor leisure which are not usually open to the public without charge and are complimentary to the rural ethos of the locality (e.g. guided walks, fishing tours, wildlife park).

Regeneration means the restoration of natural ecosystems through cyclic processes of renewal and self maintenance of species and their populations. Emphasis is more on removing threats (such as weeds and rabbits) than intensive revegetation.

Rehabilitation means to restore elements of ecological structure or function without necessarily attempting complete restoration to any specific prior condition.

Revegetation means establishment of native vegetation to a minimum standard in formerly cleared areas (that may be part of a rehabilitation or complete restoration).

Rural Pursuit means any premises used for:

(a) the rearing or agistment of animals;
(b) the stabling, agistment or training of horses;
(c) the growing of trees, plants, shrubs or flowers for replanting in domestic, commercial or industrial gardens; or
(d) the sale of produce grown solely on the lot, but does not include agriculture – extensive or agriculture – intensive.

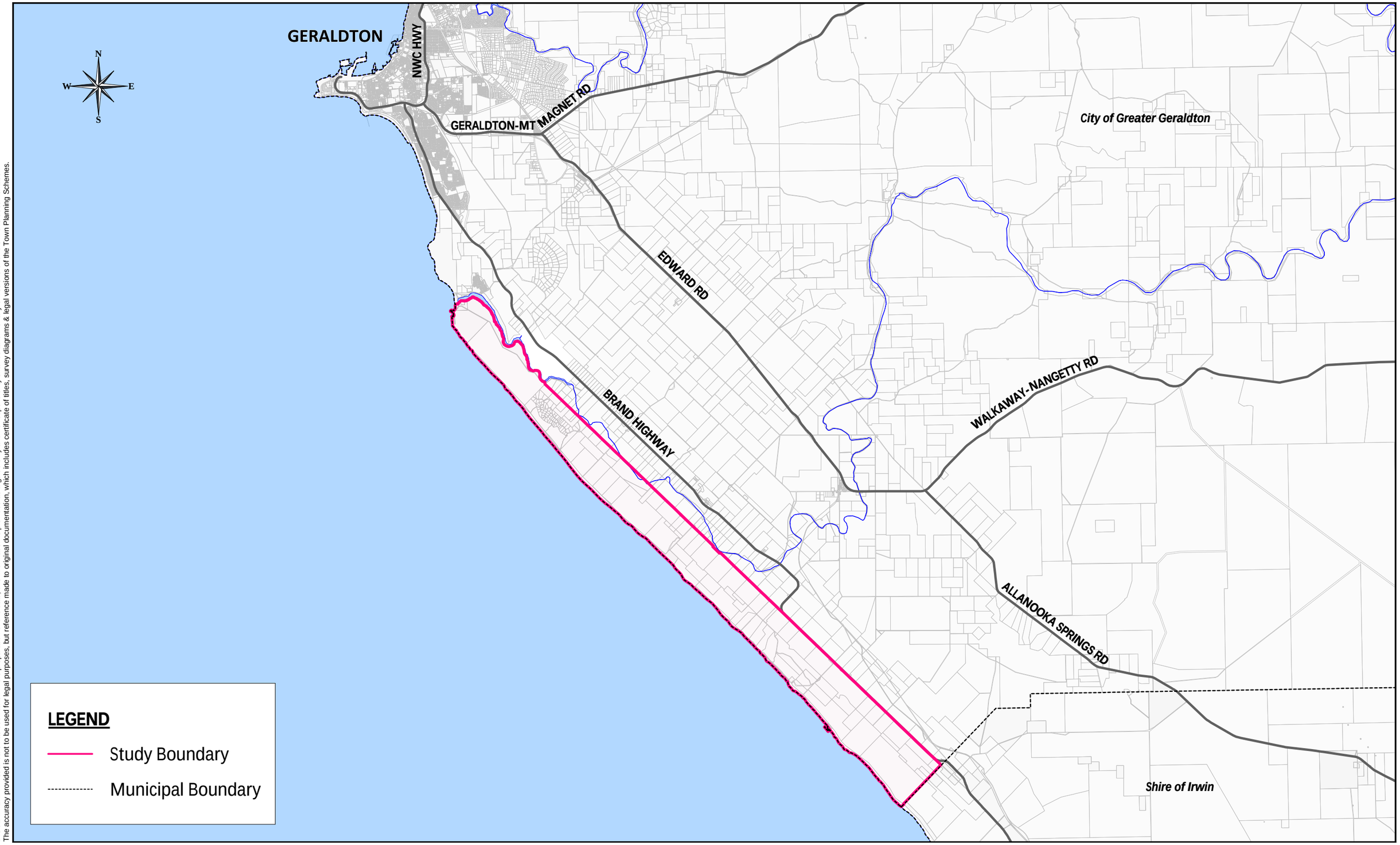
Rural Smallholdings means land used for minor rural pursuits, hobby farming, conservation and alternative residential lifestyle purposes. The land use seeks to preserve and enhance landscape quality, environmental and conservation attributes.

Sediment Cell means a length of shoreline in which interruptions to the movement of sediment along the beaches or near shore sea bed do not significantly affect beaches in the adjacent lengths of coastline. Within a sediment cell the sediments sources, transport pathways and sinks should be clearly definable.

Sustainability means the ability of our city-region's environment, social, governance, economic and cultural systems to maintain their health and resilience in perpetuity. Sustainable development is 'development that meets the needs of present generations without compromising the ability of future generations to meet their own needs'.

Vulnerability means the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity. Systems that are highly exposed, sensitive and less able to adapt are vulnerable.

FIGURES



City of Greater Geraldton
a vibrant future

Figure 1 - Study Area

Operator:	RJT
Department:	Town Planning
Drawing No:	LP/9/0090
Date: 14/08/12	Scale: 1:150,000 (A3)

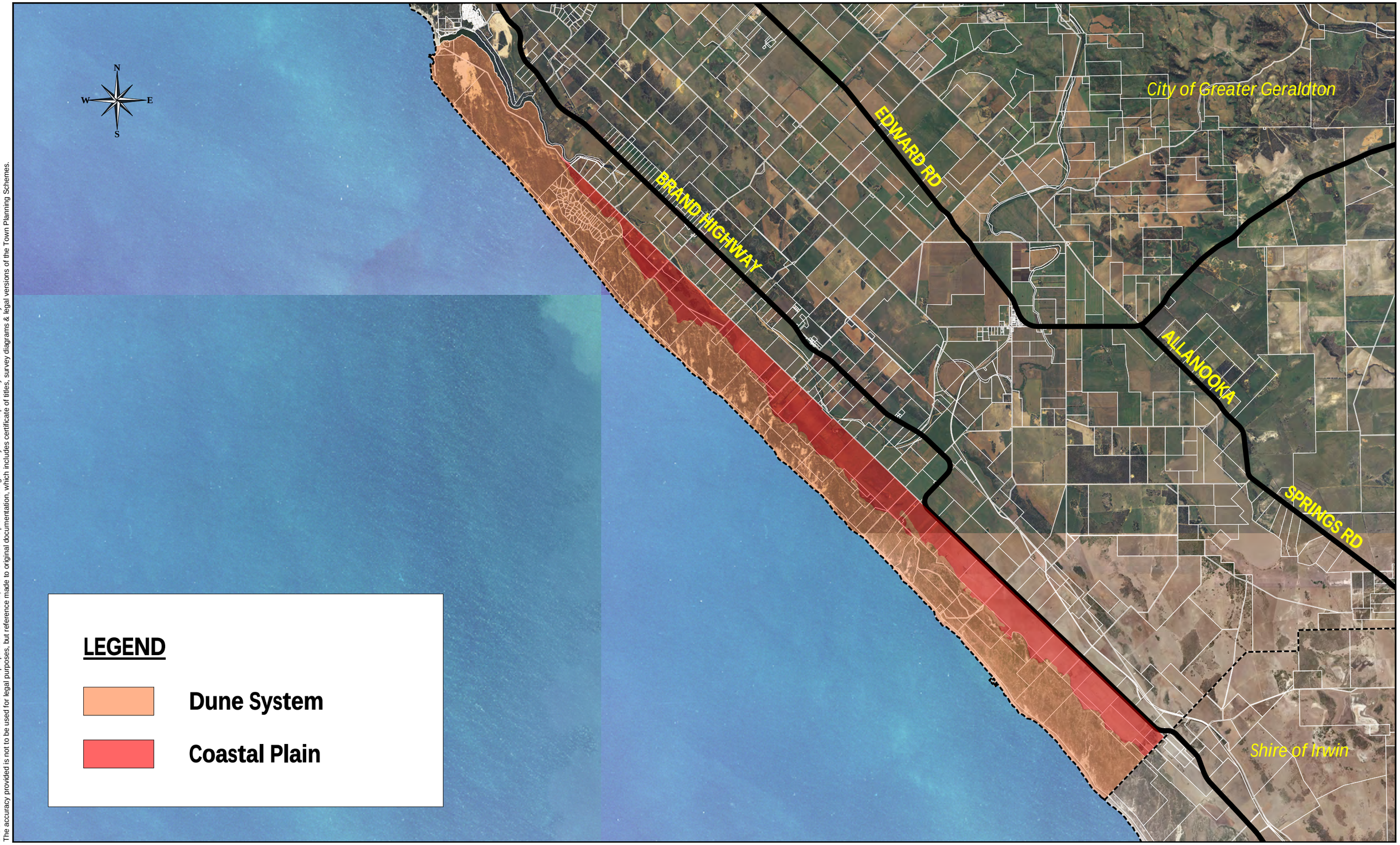


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Figure 2 - Landscape Features

Operator:	RJT
Department:	Town Planning
Drawing No:	LP/9/0090
Date: 14/08/12	Scale: 1:100,000 (A3)

N
W
E
S

BRAND HIGHWAY
EDWARD RD
ALLANOOKA
SPRINGS RD

City of Greater Geraldton

Shire of Irwin

LEGEND

- Reserve
- Freehold
- Unallocated Crown Land (UCL)

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Figure 3 - Land Tenure

Operator:	RJT
Department:	Town Planning
Drawing No:	LP/9/0090
Date: 14/08/12	Scale: 1:100,000 (A3)

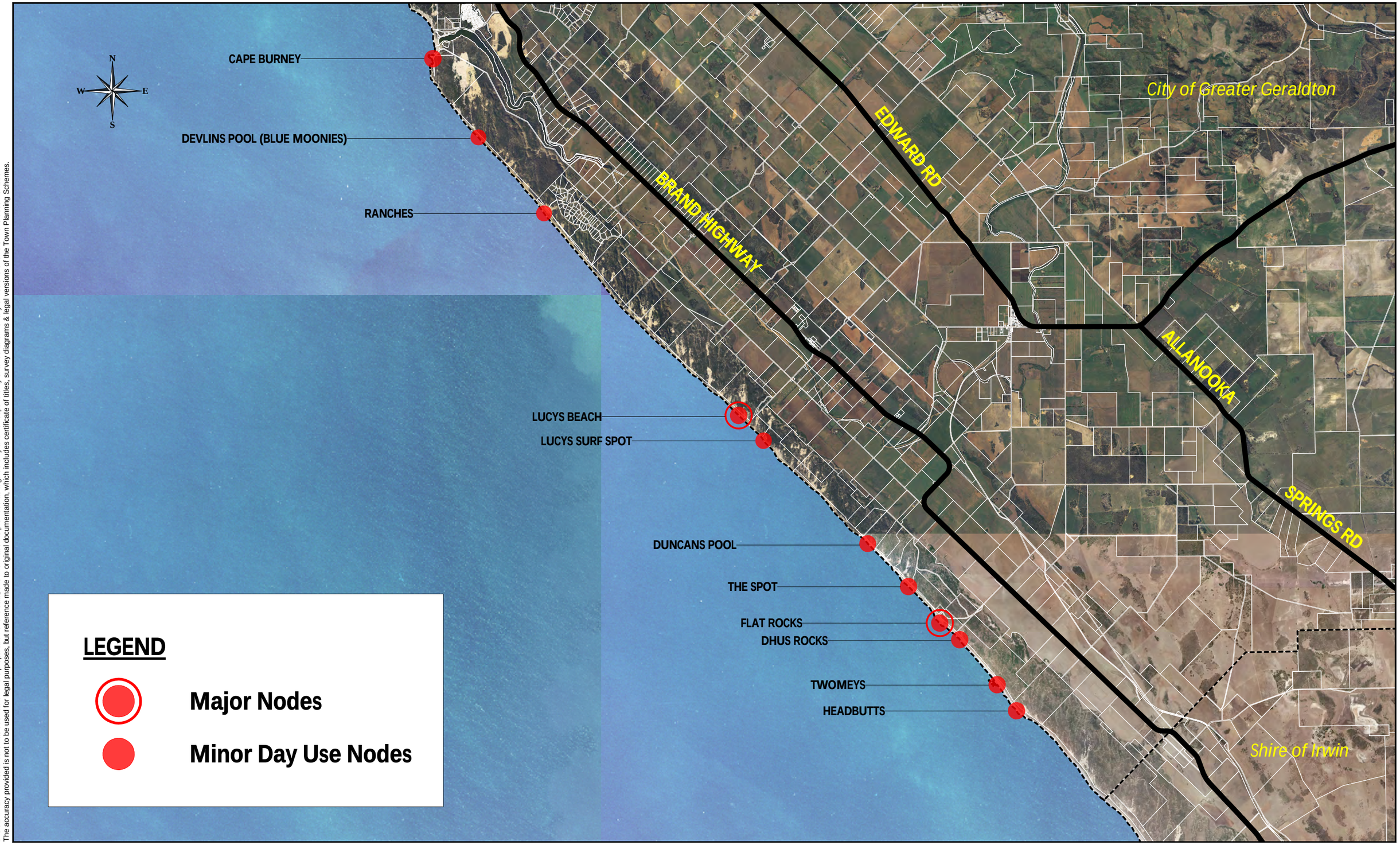

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Figure 4 - Coastal Nodes

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Date: 14/08/12	Scale: 1:100,000 (A3)

APPENDICES

Appendix A – Summary of Community Workshop Outcomes & Online Survey Results

Appendix B – Coastal Nodes Site Plans (Lucy's Beach & Flat Rocks)

Appendix C – Flood Mapping

Appendix D – Tourism WA Visitor Survey

Appendix E – Vegetation Condition Mapping