



# COASTAL MANAGEMENT STRATEGY

SHIRE OF NORTHAMPTON



# Coastal Management Strategy

Prepared for the  
**Shire of Northampton**



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# executive summary

This document presents the Coastal Management Strategy (CMS) for the Shire of Northampton. The purpose of the report is to identify current land uses, values and issues along the Shire's coast and to make recommendations for future management.

The Shire's coastal areas have been planned over many years. An original Coastal Management Strategy was prepared and adopted by the Shire in 2006. Subsequently Coastal Management Strategies have been prepared in the last 2-3 years for the coastal nodes of Kalbarri and Horrocks. These node-specific documents are still current and guiding coastal management in these locations.

The Study Area for this Coastal Management Strategy covers the remaining areas of the Shire, extending from Wagoie (north) to Oakabella Creek (south). It excludes the coastal areas included in the Horrocks Coastal Management Strategy (Little Bay to Bowes River Mouth). It updates the earlier Coastal Management Strategy prepared by Landvision and the Shire in 2006.

Planning for coastal areas is about balancing often competing needs and desires in a way that takes into account the values of the coastal zone, which include its scenic, aesthetic and ecological qualities; recreational opportunities; and social, indigenous, cultural and economic importance. In addition, consideration also needs to be given to coastal hazards relating to marine safety and long-term climate change. The overall trend is seeing growing and ongoing pressure on coastal resources as the State's population increases, coastal-based industries expand and technological changes make remote areas more accessible.

The overall effect of these values contributes to the psychological well-being and health of the local and regional community. Successful coastal planning today will ensure that current and future generations can benefit from the opportunities presented by the values and resources of the coast.

In recognition of these values and resources the Shire of Northampton identified the need to update the 2006 Coastal Strategy to guide future coastal uses along the coast. To ensure its continuing relevance to land use planning objectives it was recommended that this report be reviewed within a 10 year timeframe.

Through development of this new strategy, a number of issues have been identified. These issues include:

- The fragmented nature of land tenure of this section of coast which can result in difficulties in achieving coastal management objectives and actions, including how to manage large areas of Unallocated Crown Land

- Addressing climate variability and the potential for impacts resulting from climate change in the medium to longer term
- Appropriate management of recreational land uses to reduce and mitigate environmental degradation
- Intensifying usage of the coast due to population and urban growth and the need to cater for this but at the same time maintain the area's unique 'tranquillity and isolation'
- Appropriate management of issues associated with coastal land use such as rubbish, anti-social behaviour, environmental degradation and uncontrolled access
- The need for more policing to help manage land use
- Consideration of heritage assets and values within the area
- The need to continue and enhance community involvement in coastal management, particularly coastal landowners and traditional landowners as well as user groups and community groups with an interest in coastal management issues.

The strategic vision of the Strategy is:

**To manage the unique social, environmental and economic resources of the study area taking into account risk from coastal hazards and sea level rise.**

This vision was developed through consideration of existing and emerging issues as well as recent planning reports and new State and local government policy guidance.

To achieve the vision several objectives are identified within the document including:

- **Objective 1** – To manage the environmental and recreational values of the coastline in order to retain the broad range of recreational opportunities, environmental values and sense of isolation unique to the area
- **Objective 2** – To achieve cohesive and effective coastal land management considering the fragmented nature of land ownership
- **Objective 3** – To ensure management and protection of the coast is undertaken in a sustainable manner
- **Objective 4** – To ensure adequate consideration of coastal hazards is given and ensure management is undertaken in accordance with State Planning Policy 2.6
- **Objective 5** – To adequately consider future urban growth and tourism and the effects this may have on recreational use of the study area

- **Objective 6** – To retain, protect and enhance areas of historic value and places of cultural heritage significance within the study area
- **Objective 7** – To increase community awareness and participation in coastal management and maintain successful relationships between stakeholders and coastal landowners.

This Coastal Management Strategy identifies the specific actions needed, as well as their timing (priority) and responsibilities, to ensure the assets and values identified by the community and stakeholders of this highly valued coastline are secured for the long term, whilst avoiding actions that might conflict with long term strategic State planning directions. The implementation section of this report (Chapter 6) provides further detail regarding responsibilities, monitoring, timeframes and funding options.

The study area has been divided into three coastal management sectors. The coastline was divided into these sectors from north to south in order to focus management recommendations. The sectors are as follows (refer Figure 1.2):

- Sector 1 – From the southern boundary of Kalbarri National Park to the northern end of Hutt Lagoon (includes the coastal sites of Wagoe, Lucky Bay, Halfway Bay and Sandalwood Bay)
- Sector 2 – From the northern end of Hutt Lagoon to south of White Cliffs (includes Port Gregory, Hutt River Mouth and White Cliffs).
- Sector 3 – From south of Bowes River Mouth to the southern boundary of the Shire (includes Woolawar Gully and Oakabella Creek).

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The recommendations and background information from the Shire of Northampton Coastal Strategy 2006 (Shire of Northampton and Landvision, 2006) provided valuable input into this Strategy as well as other resources prepared by the Shire of Northampton, DPLH and NACC. This project is made possible by the State Government's Royalties for Regions' Northern Planning Program.



Department of  
**Primary Industries and  
Regional Development**



**ROYALTIES  
FOR REGIONS**

# definitions and abbreviations

**Amenity** – those factors which combine to form the present character and likely future character of an area.

**Biodiversity** – the variety of life: the different plants, animals and microorganisms and the ecosystems of which they are a part.

**Coastal foreshore reserve** – the area of land on the coast set aside in public ownership to allow for coastal processes and provide protection of ecological values, landscape, visual landscape, indigenous and cultural heritage, and public access, recreation and safety.

**Conservation** – the protection, management, sustainable use and enhancement of the natural environment.

**Development** – any change to land use, including housing, any demolition, erection, construction, alteration of or addition to any building or structure on the land and any excavation or other works.

**Dieback** – the common name given to the pathogen *Phytophthora cinnamomi* which is a soil borne water mould that invades and destroys the root systems of many native flora species in WA.

**Ecological linkage** – a series of (both contiguous and non-contiguous) natural areas that, within a landscape context, connect larger natural areas by forming stepping stones of habitat that allow the movement of organisms and genetic material between these larger natural areas.

**Ecology** – study of the relationships of animals and plants, particularly of animal and plant communities, to their surroundings, living and non-living.

**Ecosystem** – a term used to describe a specific environment to include all the biological, chemical and physical resources and the inter-relationships and dependencies that occur between those resources.

**Landscape values** – natural and/or cultural landscape features that are highly valued, as defined by documented research.

**Off-road vehicle** – an un-registered vehicle that has the ability to be used off road (e.g. quad bike, dune buggy, trail bike).

**Remnant vegetation** – stands of remaining native vegetation indigenous to a locality.

**Reserves** – may be either land classified in local planning schemes for public purposes or areas of Crown land reserved for public purposes as determined by the Land Act 1933 and the Land Administration Act 1997.

**Road Registered Vehicle** – A licensed, road registered vehicle that has the ability to be used off road (e.g. 4WD, motor bike, licensed quad bike).

**Sustainability** – meeting the needs of current and future generations through the integration of environmental protection, social advancement and economic prosperity.

**Threatened Ecological Community** – communities which consist of native vegetation which are poorly represented and in danger of extinction.

**Threatened Flora** – Rare and priority flora protected under the Environmental Protection Act 1986.

**Threatened Fauna** – Fauna protected under the Wildlife Conservation Act 1950.

**Vehicle** – A vehicle is propelled by an engine or other mechanical source of power.

## ABBREVIATIONS

---

2WD	Two Wheel Drive
4WD	Four Wheel Drive
CMS	Coastal Management Strategy
CHRMAP	Coastal Hazard Risk Management and Adaptation Plan
DBCA	Department of Biodiversity, Conservation and Attractions
DPLH	Department of Planning, Lands and Heritage
DPIRD	Department of Primary Industries and Regional Development
DotE	Department of the Environment
DoT	Department of Transport
DWER	Department of Water and Environmental Regulation
EPBC	Environmental Protection and Biodiversity Conservation
NACC	Northern Agricultural Catchments Council
ORV	Off Road Vehicle
RRV	Road Registered Vehicle

SoN	Shire of Northampton
SPP	State Planning Policy
LPS	Local Planning Scheme
UCL	Unallocated Crown Land
WAPC	Western Australian Planning Commission
WONS	Weeds of National Significance
YMAC	Yamatji Marpa Aboriginal Corporation

Please note that during preparation of this Strategy a number of government department agencies changed names and amalgamated. The previous department names are mentioned where appropriate (such as the Consultation chapter in Chapter 8).

Priorities have been classified as follows:

- S: Short term – within the next 2 financial years
- M: Medium term – within the next 5 years
- L: Long term – 5+ years
- O: Ongoing – as required

# 1.0 INTRODUCTION



## 1.1 BACKGROUND & PURPOSE

### BACKGROUND

The original Shire of Northampton Coastal Strategy was prepared in 2006 by the Shire and Landvision. Coastal strategies are typically reviewed every 10 years to address new issues and changing social, economic and environmental factors within an area. The 2006 Strategy was prepared with the view that natural environments have limited capacity to absorb land use pressures before they start to degrade and their capacity for regeneration is reduced. A range of issues have come apparent since the 2006 document was prepared. These are further explored in section 1.5 below.

### PURPOSE

This document presents the Coastal Management Strategy (CMS) for the Shire of Northampton coastline. The purpose of the CMS is to identify the current land uses, values and issues and to make recommendations in regards to the future management of the coastline. The preparation of the CMS involved a thorough consultation process with landowners, community and stakeholders, a review of new information and site assessments to determine relevant actions.

The broad steps opposite were taken during the preparation of this document.

This CMS identifies the specific actions needed, as well as their timing and responsibilities, to ensure the various assets and values identified by the community and stakeholders of this highly valued coastline are secured for the long term (Chapters 2-5). The implementation section of this report (Chapter 6) provides further detail regarding responsibilities, monitoring, timeframes and funding options.

1

Review of the Shire of Northampton Coastal Strategy 2006

2

Review documents which have been released since 2006 such as SPP 2.6 (WAPC, 2013)

3

Detailed site assessment of coastal sites

4

Consultation with the Steering Group, landowners, stakeholders, government agencies and community

5

Identification of current issues and development of strategies and actions to address them

## 1.2 STUDY AREA

The CMS extends from Wagoie (north) to Oakabella Creek (south) for a distance of approximately 80km and excludes the coastal areas included in the Horrocks Coastal Management Strategy (which includes the area including and between Little Bay to Bowes River Mouth). The study area extends inland as required at each site to include the areas most commonly used for recreational pursuits along the coastline. A context plan is provided at Figure 1.1 and the extent of the study area is provided at Figure 1.2.

Tenure along the study area is a mixture of freehold, Unallocated Crown Land (UCL) and reserves. Tenure is provided at Figure 1.3.

## 1.3 STRATEGIC VISION AND OBJECTIVES

The strategic vision for the study area is as follows:

**To manage the unique social, environmental and economic resources of the study area taking into account risk from coastal hazards and sea level rise.**

The strategic vision has been developed through outcomes of consultation and review of coastal values.

The objectives of the CMS are below. These have been developed through consideration of issues, opportunities, values and trends derived from consultation and the literature review.

- **Objective 1 – To manage the environmental and recreational values of the coastline in order to retain the broad range of recreational opportunities, environmental values and sense of isolation unique to the area.**
- **Objective 2 – To achieve cohesive and effective coastal land management considering the fragmented nature of land ownership.**
- **Objective 3 – To ensure management and protection of the coast is undertaken in a sustainable manner.**
- **Objective 4 – To ensure adequate consideration of coastal hazards is given and ensure management is undertaken in accordance with SPP 2.6.**
- **Objective 5 – To adequately consider future urban growth and tourism and the effects this may have on recreational use of the study area.**
- **Objective 6 – To retain, protect and enhance areas of historic value and places of cultural heritage significance within the study area.**
- **Objective 7 – To increase community**

**awareness and participation in coastal management and maintain successful relationships between stakeholders and coastal landowners.**

## 1.4 DOCUMENT STRUCTURE

The document consists of two parts – Part A contains strategies and actions for management of the study area and Part B contains background information relating to policies, environmental features and social characteristics. The reports and policies which provide the planning, social and environmental context for the study area are discussed in more detail in Chapter 7 in Part B.

The study area has been divided into three coastal management sectors. The coastline was divided into these sectors from north to south in order to focus management recommendations. The sectors are as follows (Figure 1.2):

- Sector 1 – From the southern boundary of Kalbarri National Park to the northern end of Hutt Lagoon (includes the coastal sites of Wagoie, Lucky Bay, Halfway Bay and Sandalwood Bay)
- Sector 2 – From the northern end of Hutt Lagoon to south of White Cliffs (includes Port Gregory, Hutt River Mouth and White Cliffs)
- Sector 3 – From south of Bowes River Mouth to the southern boundary of the Shire (includes Woolawar Gully and Oakabella Creek).

A list of actions is provided for each sector, focussing on the coastal sites listed above. A plan is included for coastal sites where diagrammatic representation of proposed actions is considered useful.

Each action is provided with a number (for easy reference and identification on the plan) as well as an indication of responsibility and priority. Further information on implementation, including a discussion on responsibilities, priorities and funding, is provided in Chapter 6.

The following chapters describe each coastal management sector in the context of:

- Description
- Community Consultation Feedback
- Issues & Opportunities
- Recommended Management Actions.

## 1.5 KEY ISSUES

Key issues relating to the study area are described in the table below. These key issues were considered in development of the actions contained in this report.

They have been identified from comments received from community consultation, meetings with the Steering Group, from a review of literature and from the site visits. The issues are trends that have emerged in coastal management over the last ten years and formed the starting point for consideration of coastal management in the Shire. Further discussion regarding issues is included in the action plan for each individual site. The table below provides a brief description of each issue and how the CMS seeks to address them.

**Table 1.1 – Key Issues**

<b>Issue</b>	<b>Comment</b>
<p><u>Coastal Tenure and Ownership</u></p> <p>The fragmented nature of land ownership of the study area can result in difficulties in achieving coastal management objectives and actions. The land tenure and ownership along the coastal area varies from state ownership, reserves vested with the Shire, land under private ownership and Unallocated Crown Land. This fragmented and varied ownership can make coastal management difficult without agreement and cohesive decision making between all parties.</p>	<p>This report aims to gather the desires and ideas from all responsible land managers to create a list of actions that are agreed upon and which can be realistically achieved over time. Coastal areas comprising either freehold or UCL are not under the management or control of the Shire (e.g. Woolwar Gully, Oakabella Creek and White Cliffs). Any issues regarding management in these areas are directed towards the landowner and DPLH.</p>
<p><u>Coastal Hazards</u></p> <p>Addressing variability in climate and sediment availability and the potential for impacts resulting from climate change in the medium to longer term.</p>	<p>Any development proposals should be in accordance with SPP 2.6. Recommendations and comment have been made with regards to coastal hazards and risks where possible.</p>
<p><u>Environmental management</u></p> <p>Appropriate management of recreational land uses to reduce and mitigate environmental degradation.</p>	<p>This can be achieved through environmental management actions recommended in this report and through the implementation of actions relating to land use management.</p>
<p><u>Access</u></p> <p>Provision and maintenance of coastal access, including consideration of vehicles and pedestrians. It is important that access to the coast is provided (where appropriate) for professional and recreational pursuits. However this needs to be balanced with environmental protection of dunes and vegetation. Having more than one access track leading to and from the same site can lead to unnecessary disturbance to dunes, which can eventually lead to erosion and dune blowouts. This can be a particular issue during peak/busy times.</p>	<p>New access tracks should be closed as soon as they form and coastal users encouraged to use existing tracks. Duplicate tracks should be closed and rehabilitated.</p>
<p><u>4WDs and Off-road Vehicles</u></p> <p>ORV use (including unlicensed vehicles and road registered vehicles) along the study area is becoming increasingly popular and requires management to help prevent land use conflict and environmental degradation. Vehicles driving through dunes can lead to vegetation damage and erosion and can also have a detrimental impact on migratory birds and their habitats. While it is important to retain this recreational land use it should be controlled by encouraging drivers to keep to existing tracks. ORV use along the beach can also be an issue where the sand is soft (and causes vehicles to become bogged) and where the tide is high (and causes vehicles to become submerged).</p>	<p>ORV use has recently been investigated by the NACC in Off-Road Vehicle Areas in the Northern Agricultural Region on Western Australia Feasibility Study which considers the options for management of ORV use along the region's coast. No 'Permitted ORV Areas' areas are proposed within the Shire.</p> <p>Driver education is encouraged in order to let coastal users know about the issues (such as soft sand, high tides, driving at safe speeds, keeping off dunes etc). This can be achieved through brochures, information available online and through signage.</p>

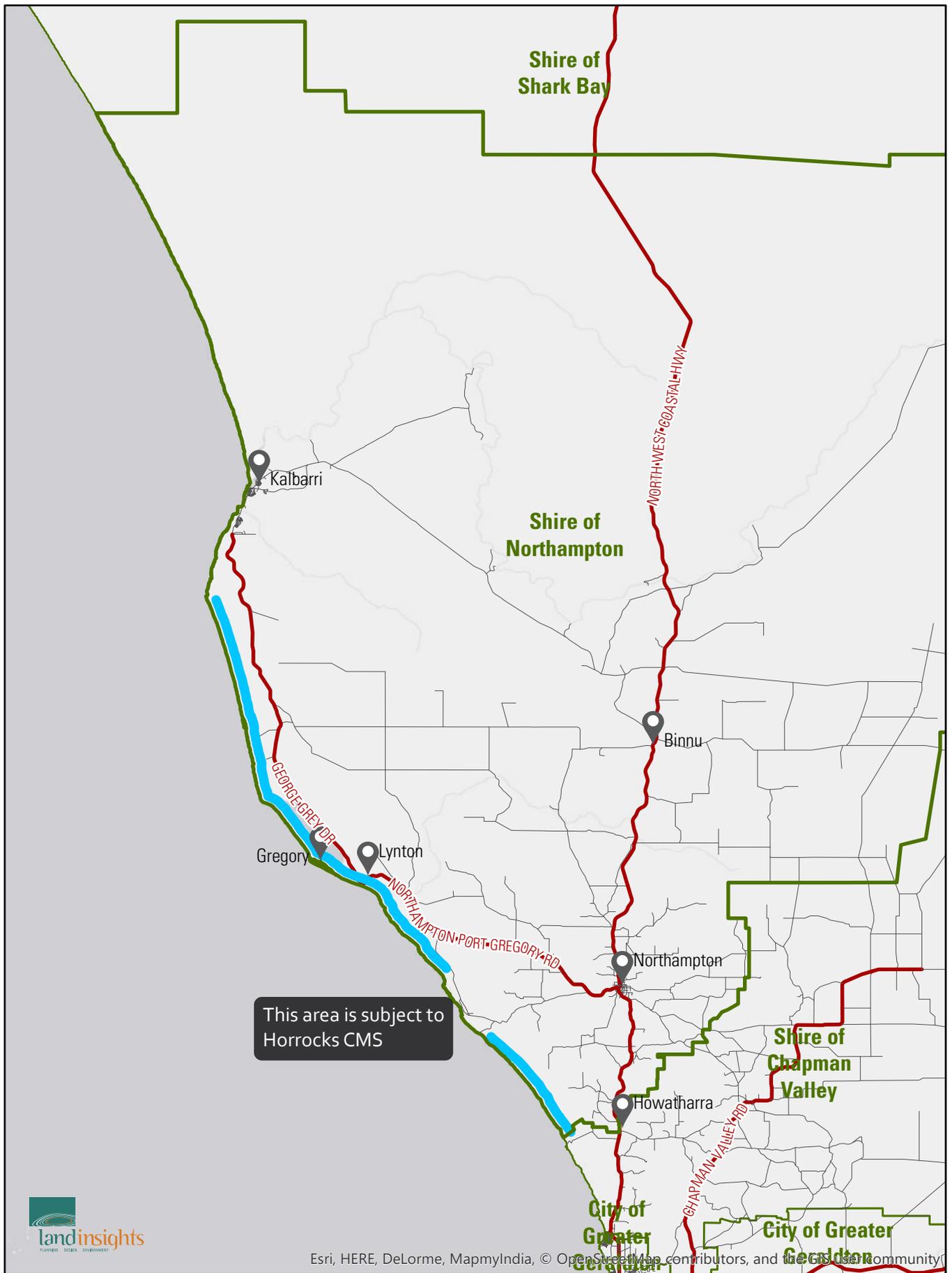
Issue	Comment
<p><u>Population Growth and Demand</u></p> <p>Resource driven population growth has intensified the demand for accessible coastal opportunities and leads to further growth in demand for recreational experiences. Anticipated pressures will be from recreational activities and overnight stays such as camping.</p> <p>Anticipated pressures from population growth and increased tourism. The Shire is in close proximity to Geraldton and provides a regional escape without having to drive long distances.</p>	<p>These anticipated pressures have led to the need to review and update the 2006 Strategy. This report makes recommendations to address anticipated use and demand.</p>
<p><u>High Recreational Value</u></p> <p>The community highly value the coastal area as a recreational resource for its aesthetic and environmental values, the sense of isolation and the broad range of recreational choices.</p> <p>As a result, the community have expressed that the Shire's coastal area requires sensitive management to preserve the current values and opportunities which are generally regarded by the community to be fairly well balanced at present.</p>	<p>This issue is addressed in the overall objectives for the management of Shire's coast and in the strategies and actions provided.</p>
<p><u>Provision of Facilities</u></p> <p>Camping is a popular activity, particularly during peak holiday periods. Holiday shacks are located at Halfway Bay, caravan parks are present at Port Gregory and Horrocks and a chalet-stay is located at Wagoie. The Lucky Bay camping node has recently been established with a few facilities. Apart from these areas no other camping areas have facilities. The popularity of this activity can cause issues with regards to rubbish and lack of amenities.</p> <p>Increased use of the coast due to population and urban growth can lead to a demand for facilities and better management. However this should be balanced with the need to maintain the wilderness quality of the coast and the peace and isolation valued by the community.</p>	<p>Each coastal site has a different level of use, with different facilities provided. Recommendations are made throughout this report for each site to address future use and provision of facilities.</p>
<p><u>Rubbish and waste</u></p> <p>Litter and rubbish was a major issue identified from community consultation. Coastal users are encouraged to take their rubbish home with them and to tidy after themselves, however there are those that leave rubbish behind or bury rubbish in the dunes, only for it to be exposed when the sand is blown away. Human waste buried or left in dunes is also a hygiene issue which is particularly prevalent during peak periods. Campers are encouraged to bring their own toilets with them.</p>	<p>Rubbish and waste can often be managed by providing rubbish bins and toilets in appropriate locations, through tighter policing and controls and via education regarding the need for beach users to take their rubbish with them when they leave. Each site within the study area has a different level of use, in some areas it would be more appropriate to provide rubbish bins and in other areas coastal users will be encouraged to take home rubbish through more signage and policing.</p>
<p><u>Policing</u></p> <p>There is an increasing requirement for active "policing" of the coast as a consequence of the issues associated with an influx of visitors during peak periods which can result in irresponsible off-road activities, creation of rubbish and waste and hygiene issues. This may only be exacerbated by future population growth and increased utilisation of the coastal area.</p>	<p>This issue will need to be considered particularly in the future use and management of Lucky Bay. Management and surveillance of this area is necessary in order to reduce the occurrence of vegetation destruction and littering. A caretaker has been established to manage the area. Other coastal sites can be patrolled by rangers. The establishment of community groups can also help achieve positive coastal outcomes.</p>

Issue	Comment
<p><u>Heritage</u></p> <p>Coastal management will need to have regard for Aboriginal cultural heritage sites and historic heritage places identified by the Department of Planning, Lands and Heritage. Registered Aboriginal Heritage Sites have been identified at Wagoie, Lucky Bay, Hutt River Mouth, and Woolwar Gully with the potential that additional Aboriginal Heritage sites might be identified in the future.</p>	<p>The CMS aims to recognise Aboriginal cultural heritage sites and historic heritage places and has identified these areas where possible. Recommendations relating to management and further investigation work aim to address site protection.</p>
<p><u>Community Involvement</u></p> <p>The need to continue and enhance community involvement in coastal management, particularly coastal land owners as well as user groups and community groups with an interest in coastal management issues. Involvement of the local community in coastal management will help lead to a greater sense of ownership and care of the coast. There are opportunities to create community coastal care groups and ways to involve the community more in management.</p>	<p>Suggestions are provided regarding ways to increase community involvement in coastal management.</p>

## 1.6 IMPLEMENTATION

Tenure along the study area is a mixture of freehold, Unallocated Crown Land (UCL) and reserves. This makes it difficult to achieve cohesive and effective coastal management unless all land managers are in agreement as to how areas are to be managed.

In order to overcome this issue, the preparation of this report has included a comprehensive consultation process with landowners, stakeholders and the community and responsibilities have been noted against each action. The CMS needs to be led by the Shire, however it is recognised that the fragmented ownership can make that difficult. As such, the Shire should focus its attention on the key areas under its control in the immediate term. In addition to this the Shire can continue dialogue with private landowners and traditional landowners who have some responsibility for coastal management to make sure that their effort is acknowledged and supported by the Shire. Implementation of the Strategy is discussed in more detail in Chapter 6.

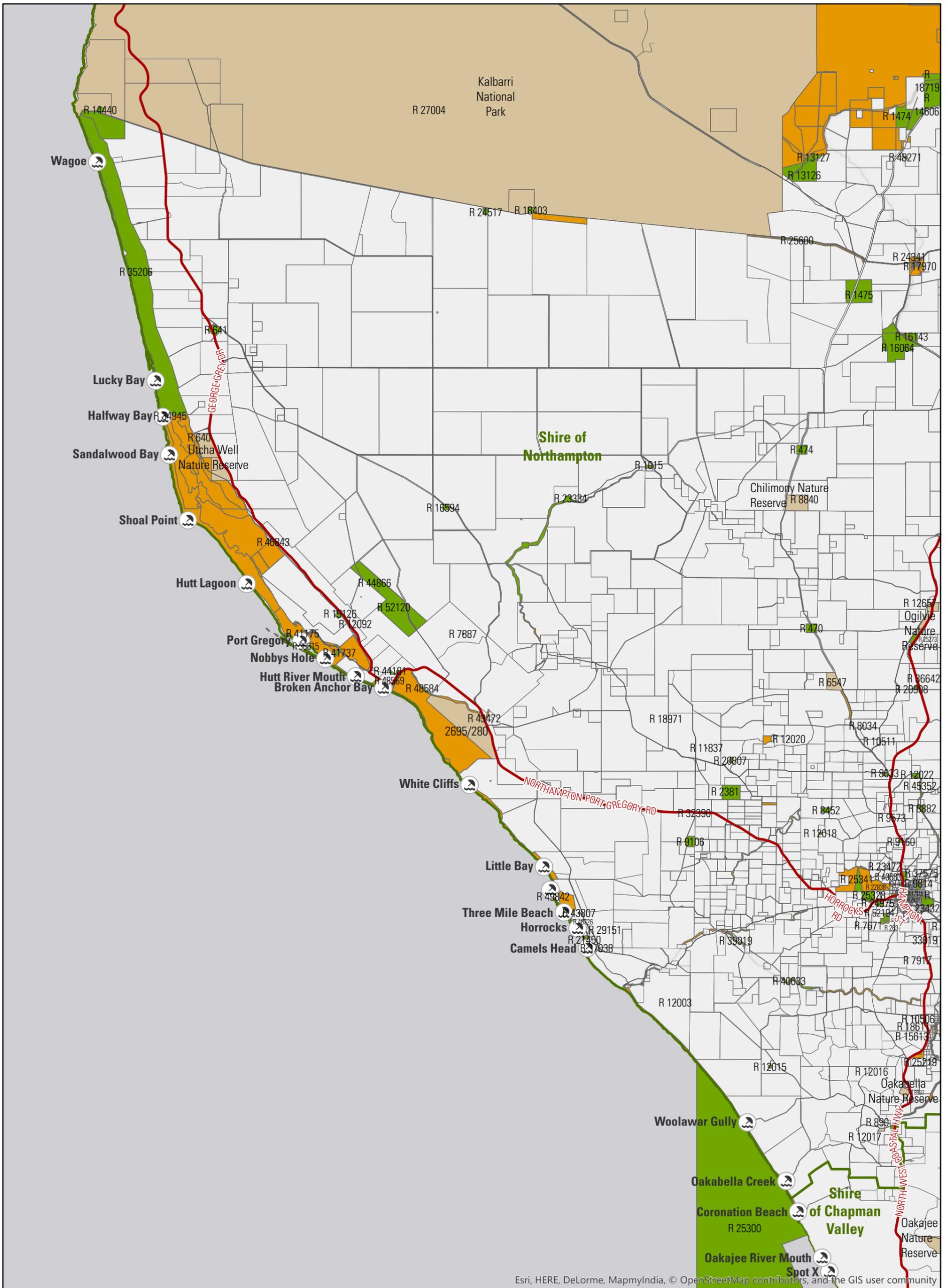


- Shire of Northampton Boundary
- Other Local Governments
- Coastal Townsite
- State Road
- Local Road
- Extent of Coastal Management Strategy

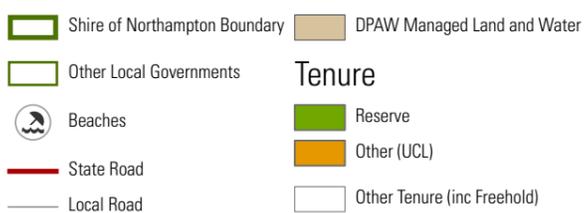


Figure 1.1 - Shire Context Coastal Management Strategy





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Scale 1:250,000



Figure 1.3 - Tenure Coastal Management Strategy

# PART A. STRATEGY AND ACTIONS



# 2.0 SECTOR 1 – WAGOE TO SANDALWOOD BAY

## 2.1 DESCRIPTION

### PLANNING CONSIDERATIONS – TENURE AND ZONING

The Shire of Northampton Local Planning Scheme No. 10 was gazetted in January 2012 and identifies the zones and reserves for land throughout the Shire of Northampton. The zones and reserves in Sector 3 are listed in the table below.

**Table 2.1 – Sector 1 Zones and Reserves**

Area	Zone/Reserve
Wagoe to Lucky Bay	Reserved as Parks and Recreation
Halfway Bay	Reserved as Parks and Recreation
Halfway Bay to Port Gregory	Zoned General Rural

The sector is also included within Special Control Area SCA 1 – Coastal Planning and Management. The Scheme provides a list of considerations for any planning and development applications within this area. The purpose and intent of this area is to:

1. To protect and enhance the environmental, cultural, recreational and/or scenic values of the area; and
2. Give priority to coastal dependent land uses and development that by their very nature require coastal sites.

Coastal tenure within Sector 1 is summarised in the table below and shown on Figure 2.1.

**Table 2.2 – Sector 1 Tenure**

Area	Tenure	Management
Wagoe (or southern boundary of Kalbarri National Park) to Halfway Bay (including Lucky Bay)	Reserve (R35206) with no management orders.  The Shire has requested vesting of a portion of R35206 for controlling camping nodes, but this only extends to just north of Lucky Bay, and does not extend to National Park boundary. If the Shire does not itself pursue management of this proposed area, management by the native title claimants, or co-management with them, could be explored.	The Department of Primary Industries and Regional Development (listed as the Department of Regional Development and Lands on the reserve document) are responsible for this reserve as it currently has no management orders assigned. Planning approval has been issued by the Shire to the Wagoe Quad Bikes and Chalets to operate quad bike tours on the reserve and a licence has been issued from the DPLH (previously DoL). The owners of Wagoe Quad Bikes and Chalets undertake a lot of management in this area.  The Shire will be responsible for management of the area to just north of Lucky Bay following the finalisation of the management orders.
Half Way Bay	Reserve (R34945) management orders with the Shire of Northampton and UCL.	Shire of Northampton manages the reserve. The Shire currently has an undetermined application to extend R34945 to just north of the shacks which are currently outside of the boundary of this reserve.
Halfway Bay to Port Gregory	UCL	DPLH, but subject to native title claim. No current active management body.

The reserve along the coast between Wagoe (or southern boundary of Kalbarri National Park) to Halfway Bay (including Lucky Bay) has no management orders assigned.

The 2006 Strategy states that the Department of Parks and Wildlife (now DBCA) were not interested in pursuing the Management Order for this reserve as they considered that there are no significant biodiversity values associated with this area to make it worthwhile to them. The Shire has requested vesting of a portion of R35206 which will extend to just north of Lucky Bay.

At Halfway Bay the Shire of Northampton has a Management Order for a 20ha Crown Reserve 34945 for the purpose of "Recreation and Holiday Cottages". The reserve was gazetted on 14 October 1977. 31 shacks or 'cottages' have been established in this reserve (as of April 2004). Three shacks are located outside of the reserve to the north. The Shire has applied to extend R34945 to just north of the shacks which are currently outside of the boundary of this reserve.

Local laws for management of the reserve were gazetted by the Shire on 28 July 1978, however these have been repealed by Council. The Shire and shack owners recently entered into lease agreements which guide the use and maintenance of the area.

## **ENVIRONMENTAL CHARACTERISTICS – LANDFORM, COAST AND VEGETATION**

### Coastal landforms

Beaches and parabolic dunes are perched on and behind a relatively continuous limestone fringing reef and rock platforms. There are high relief rocky cliffs to landward, with the cliffs located closer to the coast with distance to the north.

The reefs provide modest shelter to embayments between them and the beach, with focal embayments for recreation use at Sandalwood, Halfway and Lucky Bays. The reef transmits wave energy with variable force and the gaps have topographically controlled rip currents. The beach position varies by up to 150m as sediment is moved and trapped landward of the reef. Recent observations show sand is accumulating within Sandalwood Bay, which is limiting the amount of sediment able to transport to the north. Erosion is occurring in the northern areas, such as Lucky Bay.

The broader foreshore is subject to dune activation by ORV use, smothering and dunes climbing above cliffs to the north in Wagoë. There is risk of expanding dune activity between Lucky Bay and Halfway Bay given the ORV activity and informal camping. The dunes are less stable with distance north due to the extensive mobile sandsheets to landward and northward of Lucky Bay. Revegetation is occurring naturally behind the advancing sandsheets as fresh sediment supply is exhausted.

Additional information about this section of coast is included in Chapter 9.

### Hydrology

Surface water features within Sector 1 comprises the chain of marshes and sumplands east of Halfway Bay. These are located between the dune ridges and George Grey Drive. They contain surface water in winter, creating wet and boggy conditions on the main access route into and through the site. A groundwater well within the Halfway Bay settlement yields saline groundwater (Landvision and Shire of Northampton, 2006)

### Vegetation

The below is a description based on the 2006 Coastal Strategy (Landvision and Shire of Northampton, 2006). A survey undertaken by Landvision (2006) found the frontal dunes in this part of the coast to be generally dominated by *Spinifex longifolius*, *Atriplex isatidea*, and *Scaevola crassifolia*, with the shrubs *Acacia rostellifera* and *Olearia axillaris* and the groundcover *Carpobrotus virescens* also evident. Where the Quindalup sands extend inland into parabolic dunes and sandsheets, *Acacia rostellifera*, *A. lasiocarpa* and *Acanthocarpus preissii* are prominent on dune ridges and in swales behind the frontal dune, often creating a dense shrubland. The other species mentioned above are also present in this zone, as well as *Threlkeldia diffusa*, *Salsola kali*, *Angianthus cunninghamii*, *Isolepis nodosa*, *Rhagodia preissii* and *Myoporum accuminatum*, and the climber *Cassytha racemosa*. *Sporobolus virginicus* and *Isolepis nodosa* are found in sparsely vegetated swales, often characterised by a calcareous surface pavement, which remain in the wake of advancing sandsheets.

Near Halfway Bay, communities of stunted *Casuarina obesa* were noted from the 2006 Landvision survey inland from the coastal dunes, along the entry track between George Grey Drive and Halfway Bay. These trees are situated generally along or near the fringes of marshes, while dense communities of reeds (notably *Juncus* sp.) are found in the marshes and sumps.

## **SOCIAL CHARACTERISTICS – LAND USE, ACCESS, FACILITIES AND HERITAGE**

### Wagoë

Wagoë is located at the northern end of the study area. It is accessed for most visitors by driving along the beach (usually from the south via Lucky Bay), although visitors staying at Wagoë Chalets can also access the beach from a private access track leading from the cottages. Wagoë Chalets are accessed from a driveway leading from George Grey Drive. Some coastal users are known to trespass by

driving along the driveway and through the Wagoie Chalets in order to reach the beach without having to drive down to Lucky Bay and along the beach.

Wagoie Quad Bikes and Chalets also operate a quad bike business with planning approval from the Shire. The DPLH has issued a licence to the Wagoie Quad Bikes and Chalets for the activity. Quad bikes are driven through an existing managed track on the dunes at the northern end of the study area to the beach, then along the beach and southwards to some of the larger sand sheets. The owners and operators of Wagoie Quad Bikes and Chalets have been operating at this site for many years and undertake a large amount of coastal management including cleaning up rubbish. The Shire is supportive of this operation and very satisfied with the coastal management assistance provided by the operators at this point in time.

The beach north from Lucky Bay through Wagoie to Bluff Point appears relatively popular, with vehicles using both the beach and tracks behind the dunes to travel north from Lucky Bay as far as Bluff Point. There is also evidence of occasional camping amongst the dunes in this section of the coast.



Photo 1: Wagoie Chalets (Land Insights 2016)



Photo 2 - Camping site at Wagoie Chalets (Land Insights 2016). The dunes can be seen in the distance.

### Halfway Bay and Lucky Bay

Halfway Bay is located approximately 20km north of Port Gregory. Access to the area is via a track which extends from George Grey Drive. The track is accessible by 2WD for a majority of the year. 4WD tracks continue from Halfway Bay to provide access to Lucky Bay which is 2.5km further north. Sandalwood Bay is south of Halfway Bay and is also accessed by 4WD tracks. Some improvements to vehicle access have taken place through the site recently, including the creation of a new track which extends past the caretakers cottage and provides direct access to the Lucky Bay camping node and diverts traffic from the Halfway Bay cottages.

A number of beach cottages are located at Halfway Bay. The owners of the cottages have recently entered into lease agreements with the Shire to help manage this area. The lease conditions require that the cottages and surrounds are to be maintained to a particular standard. The leases for Part of Reserve 34945 have a length of 21 years and allow for one cottage per lease if the cottage is occupied for less than 3 months per year. Aspects of the lease agreements with regard to responsibilities and coastal management actions require clarification. This is particularly relevant to three items as follows:

- **Item 10.1 (3) Maintenance notes:**

**The Lessee must take such reasonable action as is necessary to –**

**(a) prevent, if it has occurred as a result of the Lessee's use of the Leased Area; and**

**(b) rectify or otherwise ameliorate, the effects of erosion, drift or movement of sand, soil, dust or water on or from the Leased Area.**

The lease is not clear as to what is and is not acceptable under the term 'reasonable action' for erosion control and sand drift.

- **(2) Item 17 Damage or Destruction**

**If the Cottage is totally or partially destroyed so as to require major rebuilding the Lessee or Lessee may within two (2) months of destruction or the damage terminate the Term with immediate effect by giving Notice to the other party.**

It should be clarified if smothering by dunes is included in this item. In addition it says 'Lessee or Lessee' and it should be clarified if one should be Lessor and the other Lessee.

- **(3) Item 20.1 Obligations upon determination of Lease – Removal of cottage**

Requires clarification if erosion mitigation works were undertaken as per Item 10.1 the lessee is also responsible for removal at the end of the lease if the cottage is removed.



Photo 3: Cottage, Halfway Bay (Land Insights 2016)



Photo 4: Cottage, Halfway Bay (Land Insights 2016)



Photo 5: Cottage, Halfway Bay (Land Insights 2016)

The Batavia Coast Strategy (Batavia Coast Coastal Planning Group and Landvision, 2001) identifies Halfway Bay as a site for overnight accommodation and recreation as a response to its popularity. The dunes are, however, generally unstable and there are limited sites that are appropriate for development of accommodation, so care will be required in development and management. The Batavia Coast Strategy indicates that the biggest areas of concern at Lucky Bay and Halfway Bay are the impact of residents and visitors on the environment, dune erosion, wastewater management and rubbish disposal. These issues are still applicable to the sites, particularly as visitation has most likely increased over the years. The 2006 Coastal Management Strategy also made recommendations for development of the Halfway Bay and Lucky Bay area, which have now been partly implemented by the Lucky Bay Coastal Nodes project. The Strategy recommended that the area outside the Halfway Bay reserve should have formalised access routes, campsites and other use areas and damaged or sensitive areas should be closed and rehabilitated. The basis for this recommendation is still relevant as sensitive areas should be protected and land uses managed in certain areas. Focusing public activities on the Halfway Bay reserve and north to Lucky Bay with a caretaker will allow its continued use as a recreation and accommodation node without seriously compromising its stability and amenity.

The formation of lease agreements between the Shire and cottage owners has addressed some of the management issues relating to this area. The Lucky Bay coastal nodes project has also resulted in some improvements to the area including the provision of toilets, rubbish bins and a caretaker who will oversee use of the area as well as the identification of discrete camping sites. A logical further step in the management of this area would be the preparation of a detailed Management Plan outlining the roles and responsibilities of the caretaker, as well as actions required to manage the area including rubbish bins, facilities, signage, access management and revegetation.



Photo 6: Rangers Station and camping conditions sign at the entrance to the Lucky Bay camping node (Shire of Northampton, 2017)

The Council resolved to permit camping at Lucky Bay for a trial period of 12 months (commencing from the date that camping fees were implemented) subject to the camping conditions outlined below.

1. **This is a Nature Based camping area, no potable water provided or available. Must have own adequate water supply.**
2. **If you do not have a portable chemical toilet you must camp in areas where ablutions are provided.**
3. **Observe conditions of use of ablutions.**
4. **No medical services are available.**
5. **Drive Slowly – 40km/hr on main access roads, 10km/hr within camping areas.**
6. **Maximum stay is 28 consecutive days unless otherwise approved by the Council.**
7. **Use of mobile power generators external to the vehicle permitted.**
8. **Dogs to be on leash at all times.**
9. **Fish offal to be placed in a sealed bag/container and placed in refuse bins or disposed of out to sea. Do not bury or dispose of within camping areas.**
10. **Campfires are allowed from 6.00pm to 7.00am, to be fully extinguished at all other times and subject to the following:**
11. **Fire must be within a portable self contained fire pit/vessel**
12. **Fires in natural sand pits or on ground are prohibited**
13. **Camp fires are not permitted during very high, extreme or catastrophic fire conditions.**
14. **Clearing or removal of vegetation for any purpose is strictly prohibited.**
15. **Please place all rubbish in bins provided.**
16. **The Shire of Northampton accepts no liability for personal damage or loss to any vehicle, caravan and/or campervan.**
17. **Must let tyres down to at least 20psi, must**

**have own portable air-compressor as no such services available.**

**DUMP POINT – a waste dump pointed is located on access road to Lucky Bay near camping areas, note dump point washings water is non-potable, do not use.**

It is recommended that the Camping Conditions also include reference to access and emergency procedures and possibly include a map of the area showing locations of features and facilities. An additional condition should also be included to encourage visitors to bring their own firewood.



Photo 7: New signs at the entrance to the Lucky Bay camping node (Shire of Northampton, 2017)



Photo 8: Lucky Bay (Land Insights, 2016)

## Sandalwood Bay

Sandalwood Bay is a low-key day use site located just south of Halfway Bay. No facilities are recommended at this site to encourage its continued low-key use and wilderness experience and to discourage anything more than day use of this area. Sandalwood Bay is backed by dunes supporting a stabilising cover of vegetation. It is accessed via the beach or by a track entering from the east through a difficult passage in the high frontal dune. 4WD tracks are already well defined and in order to protect coastal vegetation and landforms further vehicle encroachment should be minimised. As is mentioned earlier, sand is accumulating within Sandalwood Bay which makes access difficult at certain times, especially if the tide is in and the beach is narrow. The dunes are also soft and difficult to drive across. There may be a need to erect signage at the Halfway Bay camp site to inform visitors of the risks and issues with access to Sandalwood Bay.

## Heritage

A search was undertaken of the Aboriginal Heritage Inquiry System (DPLH, 2017) which identified two Registered Sites within Sector 1. The first is Wagoie Farm Burial (ID6750) located near Wagoie and the second is Lucky Bay (ID4647) located inland from Lucky Bay, both are artefacts/scatter, skeletal material/burial. Three Other Heritage Sites are listed in the database. These are Balline 1 (ID29011), Balline 2 (ID29012) and Balline Isolated Artefacts (ID29013) which are artefacts/scatter and all located near Lucky Bay. There may be potential that additional Aboriginal Heritage sites might be identified in the future.

The local community and traditional landowners highly value this section of the coast and there is a strong desire for more consultation and involvement on coastal management in this area.

## **2.2 SECTOR 1 – COMMUNITY CONSULTATION FEEDBACK**

Feedback from the community and stakeholders relating to this Sector is summarised below (further information is provided in Chapter 7):

- The community survey revealed that Lucky Bay and Halfway Bay were the most visited sites within the study area
- The biggest issues were rubbish, environmental damage, off-road vehicles and anti-social behaviour.
- Suggested that rubbish can be managed by providing more bins, encouraging people to take rubbish home, signage, issuing of fines and ranger presence to control this issue
- The need for more ranger presence to help control issues relating to anti-social behaviour, rubbish, toilet waste, damage to vegetation, ORV activity etc
- More signage needed to provide information to coastal users (such as letting down tyres, controlling access, encouraging people to take home rubbish etc)
- Keep coastal areas as they are (i.e. do not commercialise, do not improve access to encourage more campers, do not provide too many facilities or too many controls etc.)
- The Shire is doing a good job managing the coastal environment.

The following comments were gathered from the community meetings held at the Shire:

- Concerns about how the site will be managed by the new caretaker, especially during peak periods, and especially considering there are a number of access tracks that lead from the road into the site (i.e. there are many ways to get to the site)
- Visitors also camp elsewhere in the dunes
- Aboriginal Heritage Study of Lucky Bay – considered to not be comprehensive enough as it did not involve a physical Aboriginal heritage survey.
- Ensure that leasees keep their areas tidy and clean.

## **2.3 ISSUES AND OPPORTUNITIES**

A review of all issues and opportunities and how they have helped form the actions is provided below.

### **WAGOE**

The most common issues at Wagoie include those associated with informal camping (rubbish, human waste left in dunes, uncontrolled 4WD access) and trespassers at

the Wagoie Chalets. Dune activity and potential sand drift onto farmland is an issue. Dunes have migrated northward in the order of 75m in 14 years, with transport rates expected to be more rapid above the cliffs.

## HALFWAY BAY AND LUCKY BAY

### LAND USE AND CAMPING

Halfway Bay includes the area currently occupied by shacks and the new camping node located directly to the north. Informal camping is popular, especially during peak periods (such as the summer holidays and Easter break) when a large number of people visit the area. Camping occurs in sheltered pockets afforded by the dunal terrain and vegetation near the beach and, during peak periods, can even be found on the far side of a series of claypans and marshes, around the base of a vegetated secondary dune. Anecdotal evidence suggests that campers can be found all over the area, even stretching north along the coast to Wagoie during busy periods as campers try to find a space of their own to camp.

Damage occasioned by camping is of concern, particularly during peak periods when the sheer number of people to the area can damage dunes and vegetation in an intense, short period which makes it harder for the area to recuperate naturally. Vegetation can be damaged and removed to make room for camp sites, for fire wood and to make pathways for pedestrians and vehicles. Creation of new vehicle tracks can lead to vegetation destruction and dune erosion. A number of tracks already exist throughout the area and additional tracks should be discouraged. Informal, duplicate or new tracks throughout the dunes should be closed as soon as they form, with access restricted to defined tracks indicated by signposting. Campfires increase the general fire risk if they are not well contained and/or if they are lit during periods of high bushfire risk. This is addressed in the Lucky Bay Camping Rules.



Photo 9: Camping Area at Lucky Bay (Land Insights, 2016)

A caretaker has recently been appointed to the area and some facilities (such as toilets, formal camp sites and dumping points) have been established. It is recommended that a Management Plan is prepared for Halfway Bay and Lucky Bay to address the following:

- ongoing revegetation and construction work
- management of facilities, rubbish, access and signage
- fee collection
- responsibilities of the caretaker
- conditions for camping within the area
- capacity limits.

The large numbers of people who visit the area in peak periods may not all be accommodated in the new coastal camping node (as identified in the Shire's coastal camping node study). Overflow areas were identified in the 2006 Coastal Strategy. They might be considered in the long term as new camping nodes if demand requires it, subject to further consideration of the issues and opportunities and consultation with the community and traditional landowners. If so, the areas can be better defined and pedestrian and vehicle access tracks to the beach established in order to protect surrounding areas. Signs can be provided to provide directions and to encourage visitors to stay on established tracks.

At Lucky Bay, extensive mobile sandsheets advancing northwards mitigate against provision of any permanent facilities. Variability in beach position of up to 150m is another factor affecting implementation of facilities due to potential smothering or erosion hazards. While toilet facilities are provided at the camping node, they are not recommended to be developed at Lucky Bay itself due to the variability in beach position and the difficulty with access.

### REVEGETATION

The management actions in this CMS and the proposed Management Plan should assist with defining camping areas, closing tracks and concentrating activity to certain areas will allow natural regeneration to occur. The process can be assisted by active revegetation, using temporary stabilisation measures complemented by plant introduction. The 2006 Strategy recommended revegetation along the primary dunes south of the shacks, however this area appears to have good vegetation cover now and active revegetation here is not recommended. Some active revegetation may be required throughout the Halfway Bay reserve over time to replace any plants lost or damaged, to improve the general amenity of the area and to provide additional shade and shelter.

The Lucky Bay camping node north of Halfway Bay should also be monitored for plant condition and active revegetation may be required if degradation occurs. New tracks should be closed as soon as they appear. This can be assisted through the placement of brush over these areas to help trap sand, reduce erosion and encourage plant regrowth. Closed tracks should be stabilised by placing brush on at least the first 10 to 20m where they exit retained tracks. Light brushing along the balance of their length would also be helpful.

### BOAT LAUNCHING

There are no boat ramps at Sandalwood, Halfway or Lucky Bays, but launching occurs off the beach at Lucky Bay. The soft sand and steep beach profile demand experienced 4WD operation to get boats to the water.

The Batavia Coast Strategy recommended investigation of a formalised launching facility, however the 2006 Strategy concluded after seeking advice from local shack owners that at Halfway Bay the exposure of the coast to the elements makes it a difficult location for boat launching. It is advised that a fixed boat ramp should not be placed in this area because of fluctuating beach position in lee of the reef. Large volumes of sediment move through this area.

### SUMMARY

A review of all issues and opportunities is provided in the table below. The issues and opportunities are also displayed on Figure 2.1.

**Table 2.3 – Sector 1 Issues and opportunities**

Issues	Opportunities
Informal camping throughout the dunes north of the Halfway Bay shacks.	<p>A camping node has recently been established north of the shacks to help manage camping, especially during peak periods. Toilets have been established to provide facilities for campers without toilets to help manage issues associated with rubbish and waste. Only campers with toilets can camp outside of the node.</p> <p>Further camping nodes were identified in the 2006 Strategy to meet demand (if necessary).</p>

Issues	Opportunities
<p>Rubbish disposal is also an issue in the area and was identified as a common issue in the community consultation undertaken. Though many people dispose their rubbish responsibly, there is ample evidence of its random disposal, particularly around campsites.</p> <p>Disposal of human waste is also of concern, especially from campers who do not bring their own toilet facilities and waste (including toilet paper etc) is left in the dunes. This is of particular concern during busy periods.</p>	<p>The recently established camping node has toilets and a dump point to help manage human waste. Other campers will be permitted to camp elsewhere as long as they have their own toilets. The caretaker will help manage and police this issue and issue fines for non-compliance.</p> <p>Campers are encouraged to take rubbish home with them or to use the rubbish bins provided.</p>
<p>Informal access through dunes, creation of multiple tracks and increased 4WD activity which can lead to dune erosion and degradation of the area.</p>	<p>Maintain established tracks, use of signs to direct vehicles to tracks, close duplicate and informal tracks and policing of the area.</p>
<p>Adequate management of the area, including revegetation, monitoring and policing rubbish, use of toilets, anti-social behaviour and access.</p>	<p>A caretaker has been appointed to help manage the area. A Management Plan should be prepared for Halfway and Lucky Bay to set out the roles and responsibilities of the caretaker, as well as actions required to manage the area including rubbish bins, facilities, signage, access management and revegetation.</p>
<p>Management responsibilities for the UCL and R35206 which makes up a large proportion of this sector. The DPLH (previously Department of Lands) is the responsible authority of UCL but rarely take on an active role in management.</p>	<p>The Shire has requested vesting of a portion of R35206 for controlling camping nodes, but this only extends to just north of Lucky Bay, and does not extend to National Park boundary. If the Shire does not itself pursue management of this proposed area, management by the native title claimants, or co-management with them, could be explored.</p>

Issues	Opportunities
Impact of sea level rise and coastal hazards such as erosion, inundation and sand drift.	Further studies would be required to determine the coastal hazards and risks. Considering the low-key use of the area and the absence of hard structures the urgency is relatively low in comparison to areas with high coastal risks, high land use and permanent structures. Community education on the variability of the coastal position with fluctuations of >100m is required.
Community and landowner involvement should be continued and encouraged. Traditional landowners have expressed that they have felt excluded from some of the studies and Shire decisions made for the area.	The Shire should maintain effective communication with all community and stakeholders including traditional landowners, shack owners and the broader community who use the area. Consultation with traditional landowners about the protection of Aboriginal cultural heritage is particularly important given the cultural heritage values of the area and the occurrence of UCL which is subject to Native Title claim.
Signs provide a way to inform people about the location they are in and the interesting features. It also provides a means of informing people about dangers, rules and regulations and directions.	New signs have recently been erected at Halfway and Lucky Bay. It is recommended that some signage is also provided to address the access issues to Sandalwood Bay.

Issues	Opportunities
Lease agreements for Part of Reserve 34945 implemented for cottages at Halfway Bay requiring clarification and specification	<p>Clarify and specify aspects of the lease agreements to improve coastal management and clarify responsibilities following from comments in Chapter 2.1. This includes:</p> <ol style="list-style-type: none"> <li>1. (Item 10.1) clarifying what is and is not acceptable under the term 'reasonable action' for erosion control and sand drift.</li> <li>2. (Item 17) clarifying if smothering by dunes is included in Item 17 and modify typing error of 'Lessee or Lessee'.</li> <li>3. (Item 20.1) clarifying if erosion mitigation works under 10.1 require the lessee to remove the erosion mitigation works at the end of the lease if the cottage is removed.</li> </ol>

## 2.4 SECTOR 1 – RECOMMENDED ACTIONS

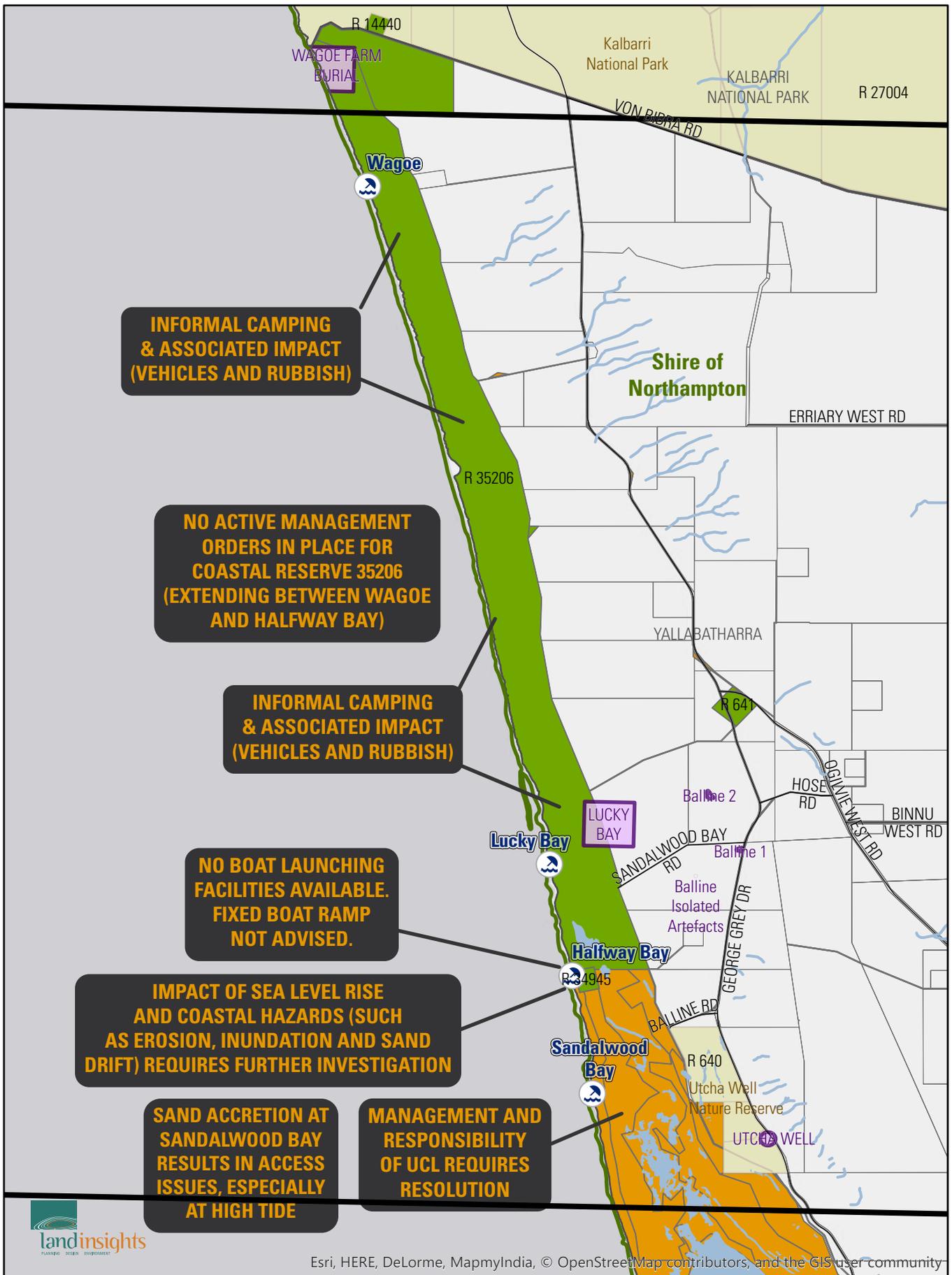
The recommended actions for Sector 1 are included below and are shown on Figures 2.2 – 2.4.

**Table 2.4 – Sector 1 Recommended Actions**

<b>Action #</b>	<b>Description</b>	<b>Priority</b> S – Short M – Medium L – Long O – Ongoing	<b>Responsibility</b>
<b>Wagoe</b>			
W1	The rate of dune movement at Wagoe Bay (chalet area) should be monitored at ~5-yearly intervals. When sand drift is <100m from the chalets a sand drift management plan should be developed.	M-L	DPLH
W2	At Wagoe Bay areas should be identified where quadbikes and 4WD use should be discouraged to reduce the risk of exacerbating sand drift. Any signage that is installed should be frequently moved due to rapid rates of smothering and dune mobility.	O	DPLH
W3	Continue to support the managers and operators of the Wagoe Quad Bikes and Chalets with regards to rubbish clean-ups and access management.	O	SoN
W4	Erect signage at the entrance to the Wagoe Chalets regarding trespass. Shire assist with any known trespass issues.	O	Landowner
W5	Erect signs at Lucky Bay and at intervals along the beach to Wagoe advising vehicles to stay on the beach. Signs may need to be moved as the beach position fluctuates.	S	DPLH
<b>Lucky Bay and Halfway Bay</b>			
HB1	Finalise the vesting of a portion of R35206 to just north of Lucky Bay and the extension of R34945 to just north of the existing shacks.	S	SoN, DPLH, Landgate Native Title parties
HB2	No further cottage development to be permitted at Halfway Bay.	O	SoN
HB3	Support the caretaker at Halfway Bay/Lucky Bay with their duties and responsibilities.	O	SoN
HB4	Prepare a Management Plan for Halfway Bay and Lucky Bay (i.e. the areas which are currently under management of the Shire (R34945) or soon to be under the management of the Shire (subject to approval) (part of R35206)) to address the following: <ul style="list-style-type: none"> <li>• ongoing revegetation and construction work</li> <li>• management of facilities, rubbish, access and signage</li> <li>• fee collection</li> <li>• responsibilities of the caretaker</li> <li>• conditions for camping within the area</li> <li>• capacity limits.</li> </ul>	S	SoN

Action #	Description	Priority S – Short M – Medium L – Long O – Ongoing	Responsibility
HB5	Update the Lucky Bay Camping Conditions flyer/information brochure for visitors to include information on emergency procedures and access and to include a map of the area showing features and facilities. An additional condition should also be included to encourage visitors to bring their own firewood.	S	SoN
HB6	Monitor the use of the Lucky Bay camping node, particularly during peak periods, including the number of campers, location of camping, use of facilities (toilets and dump point) and creation of rubbish.	O	SoN Caretaker
HB7	Require visitors camping outside of the Lucky Bay camping node have their own toilet facilities and issue fines for non-compliance.	O	SoN Caretaker
HB8	Liaise and consult with traditional landowners with regards to use and management of the area. Involve traditional landowners in the ongoing use and management of the area, including for instance protection of heritage and ethnographic sites, promoting youth land care programs and active management of the area.	O	SoN DPLH
HB9	Close new 4WD vehicle tracks as soon as they form by placing obstacles (logs or boulders) and brush at the entrance and through the use of signage (where necessary).	O	SoN
HB10	Encourage coastal users to drive on existing tracks by: <ul style="list-style-type: none"> <li>● Installing signage at key locations</li> <li>● Close new tracks as soon as they form.</li> </ul>	O	SoN Caretaker
HB11	Encourage coastal users to take rubbish home with them or to use the rubbish bins provided at the entrance to the camp site.	O	SoN
HB12	Monitor vegetation condition and revegetate if there are signs of disturbance or degradation.	O	SoN
HB13	Avoid construction of fixed and permanent infrastructure close to the coast without caveats for removal and responsibility for maintenance and removal.	O	SoN
HB14	Clarify and specify lease agreements for Part of Reserve R34945 implemented for cottages at Halfway Bay. This includes: <ul style="list-style-type: none"> <li>● 10.1(3) Maintenance. Requires clarification as to what is and isn't acceptable under reasonable action for erosion control and sand drift.</li> <li>● 17. Damage or destruction. Clarify that smothering by dunes is included in this Item.</li> <li>● 20.1 Obligations upon determination of Lease – Removal of cottage. Requires clarification if erosion mitigation works were undertaken as per Item 10.1 the lessee is also responsible for removal at the end of the lease if the cottage is removed.</li> </ul>	S	SoN

<b>Action #</b>	<b>Description</b>	<b>Priority</b> S – Short M – Medium L – Long O – Ongoing	<b>Responsibility</b>
HB15	Educate community on variability of beach position, particularly in relation to providing safe boat launching. This can be done through the use of flyers and brochures available at tourist sites and the Shire office and through the use of signs.	S	SoN
HB16	Ensure all emergency management procedures are in place. Prepare an emergency management plan specific to Halfway / Lucky Bay.	S	SoN
HB17	Erect signage at Halfway Bay to advise users of the issues with access to Sandalwood Bay at high tide and to advise of an alternative route (if one is available).	S	SoN
<b>Sandalwood Bay</b>			
S1	Retain Sandalwood Bay as a low-key day use area. No formal facilities to be provided.	O	DPLH
S2	Close duplicate 4WD tracks at Sandalwood Bay	O	DPLH



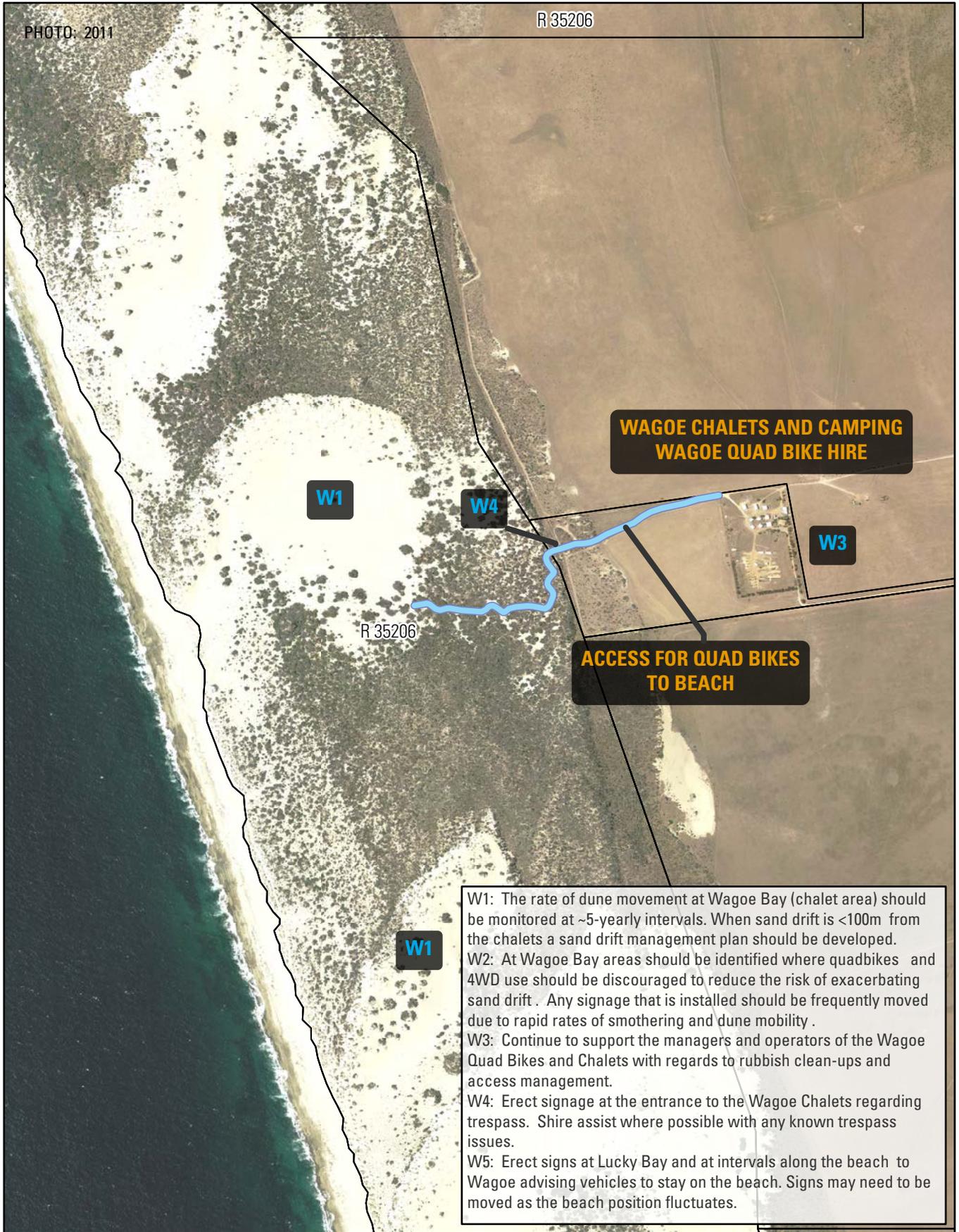
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

- Beaches
- Shire of Northampton Boundary
- Localities
- Other Local Governments
- Water Feature
- Sector Boundaries
- DPAW Managed Land
- Registered Aboriginal Sites
- Tenure**
- Reserve
- Other (UCL)
- Other Tenure (inc Freehold)

Scale 1:120,000



Figure 2.1 - Opportunities & Issues  
SECTOR 1 - WAGOE TO SANDALWOOD  
**Coastal Management Strategy**



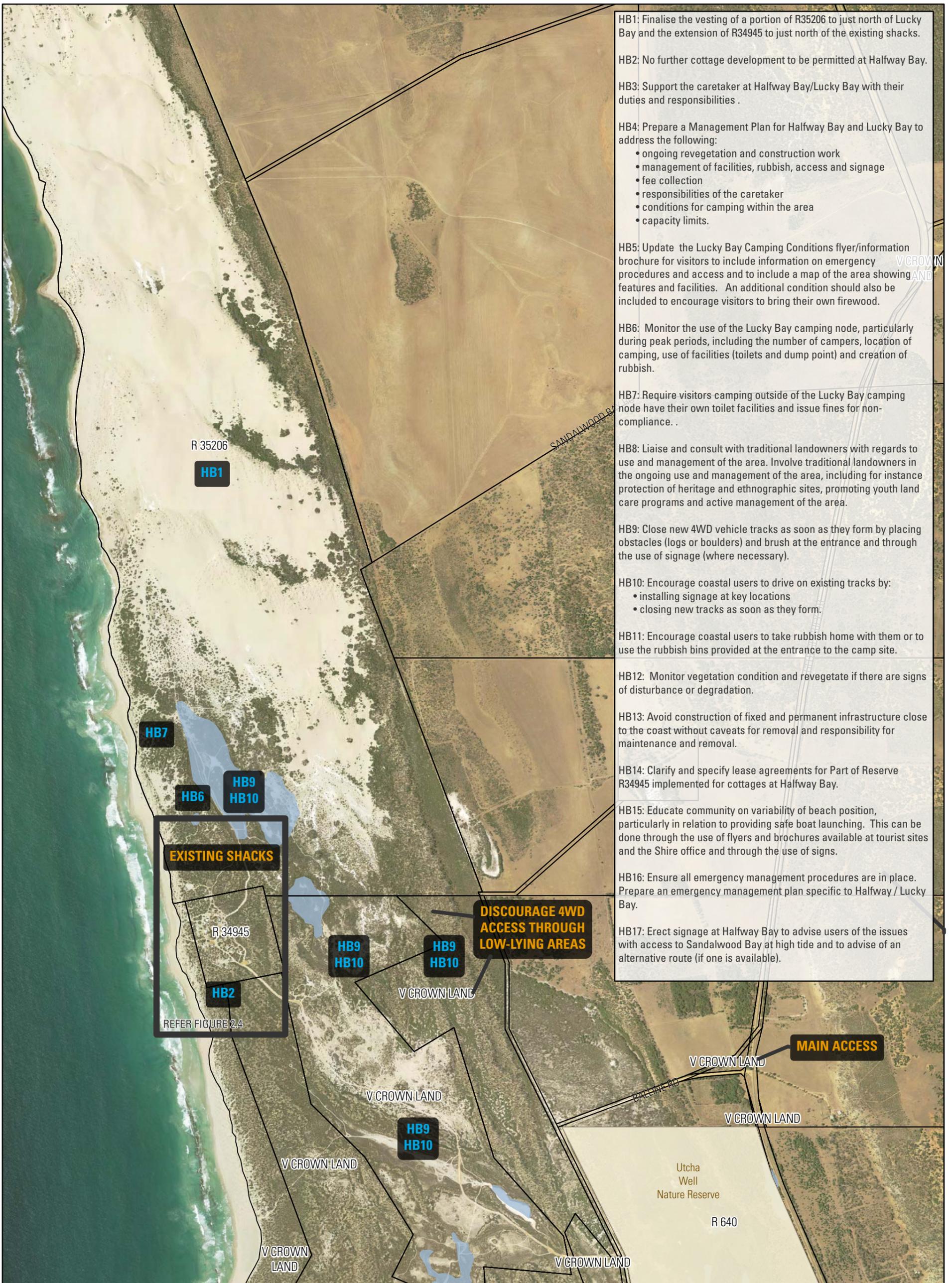
— Wagoe Quad Bike Access

Scale 1:15,000



Figure 2.2 - Site Plan  
WAGOE

**Coastal Management Strategy**



- HB1: Finalise the vesting of a portion of R35206 to just north of Lucky Bay and the extension of R34945 to just north of the existing shacks.
- HB2: No further cottage development to be permitted at Halfway Bay.
- HB3: Support the caretaker at Halfway Bay/Lucky Bay with their duties and responsibilities .
- HB4: Prepare a Management Plan for Halfway Bay and Lucky Bay to address the following:
  - ongoing revegetation and construction work
  - management of facilities, rubbish, access and signage
  - fee collection
  - responsibilities of the caretaker
  - conditions for camping within the area
  - capacity limits.
- HB5: Update the Lucky Bay Camping Conditions flyer/information brochure for visitors to include information on emergency procedures and access and to include a map of the area showing features and facilities. An additional condition should also be included to encourage visitors to bring their own firewood.
- HB6: Monitor the use of the Lucky Bay camping node, particularly during peak periods, including the number of campers, location of camping, use of facilities (toilets and dump point) and creation of rubbish.
- HB7: Require visitors camping outside of the Lucky Bay camping node have their own toilet facilities and issue fines for non-compliance. .
- HB8: Liaise and consult with traditional landowners with regards to use and management of the area. Involve traditional landowners in the ongoing use and management of the area, including for instance protection of heritage and ethnographic sites, promoting youth land care programs and active management of the area.
- HB9: Close new 4WD vehicle tracks as soon as they form by placing obstacles (logs or boulders) and brush at the entrance and through the use of signage (where necessary).
- HB10: Encourage coastal users to drive on existing tracks by:
  - installing signage at key locations
  - closing new tracks as soon as they form.
- HB11: Encourage coastal users to take rubbish home with them or to use the rubbish bins provided at the entrance to the camp site.
- HB12: Monitor vegetation condition and revegetate if there are signs of disturbance or degradation.
- HB13: Avoid construction of fixed and permanent infrastructure close to the coast without caveats for removal and responsibility for maintenance and removal.
- HB14: Clarify and specify lease agreements for Part of Reserve R34945 implemented for cottages at Halfway Bay.
- HB15: Educate community on variability of beach position, particularly in relation to providing safe boat launching. This can be done through the use of flyers and brochures available at tourist sites and the Shire office and through the use of signs.
- HB16: Ensure all emergency management procedures are in place. Prepare an emergency management plan specific to Halfway / Lucky Bay.
- HB17: Erect signage at Halfway Bay to advise users of the issues with access to Sandalwood Bay at high tide and to advise of an alternative route (if one is available).

Water Feature

Scale 1:20,000



Figure 2.3 - Site Plan  
HALFWAY BAY AND LUCKY BAY  
Coastal Management Strategy



-  Main Access
-  New Access to Camping Area (indicative)
-  4WD Access
-  Pedestrian Path to Beach
-  Water Feature

  
Scale 1:7,500



Figure 2.4 - Site Plan  
HALFWAY BAY  
**Coastal Management Plan**



# 3.0 SECTOR 2 – HUTT LAGOON TO WHITE CLIFFS

### 3.1 DESCRIPTION

#### PLANNING CONSIDERATIONS – TENURE AND ZONING

The zones and reserves throughout Sector 2 are listed in the table below. The sector is also included within Special Control Area SCA 1 – Coastal Planning and Management.

**Table 3.1 – Sector 2 Zones and Reserves**

Area	Zone/Reserve
Halfway Bay to Port Gregory	Zoned General Rural
Port Gregory foreshore	Jetty and car parking areas are Reserved for Public Purposes – HIP (Historical Purposes). The public toilets are Reserved for Public Purposes – PT (Public Toilet). The coastal area north and south is zoned General Rural.
Hutt River	Zoned General Rural
Hutt River to Little Bay	Zoned General Rural

Coastal tenure within Sector 2 is outlined in the table below:

**Table 3.2 – Sector 2 Tenure**

Area	Tenure	Management
Halfway Bay to Port Gregory	UCL.	DPLH, but subject to native title claim.  No current active management body.
Port Gregory foreshore	Townsite is mixture of freehold, Reserve (R36615) management orders with Minister of Transport (includes the jetty and car park), Reserve (R50063) management orders with the Shire of Northampton (includes the toilets).	The jetty, car park and gravel car park is managed by the Department of Transport. The public toilets are managed by the Shire. The remainder of the beach and coastal areas (including the picnic/BBQ area at the car park) are UCL which have responsibility with DPLH, but subject to native title claim and no current active management body.

Area	Tenure	Management
Port Gregory to Hutt River Mouth	UCL.	DPLH, but subject to native title claim.  No current active management body.
Hutt River Mouth	Mixture of Freehold and UCL within the rivermouth and along the coast, Reserve (R48584) management orders with the Shire of Northampton along the western side of the river foreshore.	Freehold areas are the responsibility of the landowner. The reserve along a portion of the western side of the river is managed by the Shire. Areas of UCL are the responsibility with DPLH, but subject to native title claim and no current active management body.
Hutt River Mouth to Little Bay.	UCL and Freehold.	Freehold areas are the responsibility of the landowner. UCL are the responsibility with DPLH, but subject to native title claim and no current active management body.

The 2006 Strategy made a recommendation for the Department of Parks and Wildlife (now DBCA) to take the management orders for the UCL on the southern side of Hutt Lagoon. DBCA have advised that management orders will not be accepted by that Department without native title negotiations being completed for the following:

- UCL (Location 11832) south of Hutt River mouth
- The portion of Hutt Lagoon that is currently designated as UCL (between Port Gregory and Halfway Bay) and the area of UCL south of Hutt River excluding the portion of UCL over the beach.

In addition, the Department of Mines, Industry Regulation and Safety (previously Department of Mines and Petroleum) have advised that UCL south of Hutt River is also subject to a Live Tenement. As a result, it is not recommended that any changes in management orders take place for the term of this Strategy.

#### ENVIRONMENTAL CHARACTERISTICS – LANDFORM, COAST AND VEGETATION

##### COASTAL LANDFORMS

This sector is located wholly within the primary sediment cell of Whale Boat Cove to Bluff Point and covers part or all of three secondary cells and four tertiary cells (Stul et

al. 2014), excluding the Coronation Beach area. Coastal landforms in this area are mapped and presented in Eliot et al. (2013) and reproduced in Appendix A.

The sector has a large deviation between the limestone reefs and the high calcarenite ridge to landward, of up to 3km. Large parabolic dunes have formed along and landward of the limestone reef system impounding the Hutt Lagoon. Sand is supplied from the south, from cliff erosion and from the Hutt River that contributes to variability in beach position.

Port Gregory abuts a large marine lagoon sheltered by an offshore reef. The reef which extends for about 4.5km to create the lagoon meets the beach 2.5km south of the town and terminates offshore to the north (Landvision and Shire of Northampton, 2006). The reef is more discontinuous north of Leander Reef. The foreshore within the lagoon at Port Gregory experiences variability in: (i) sediment supply, (ii) beach position in the lee of the limestone reef and (iii) dune activity. This is in part due to variability in sediment supply from the cliff erosion and intermittent flooding of the Hutt River to the southeast. The beaches at the townsite have been accreting in recent years limiting the function of the jetty. The dynamics of Port Gregory townsite are explained in further detail in Chapter 9.

The town sits in a swale behind the primary dune where there is a small area of flatter but low terrain. There is a single access point for vehicles, boats and beachgoers which is subject to accretion by wind blown sand. North of the town, the water table emerges to form shallow marshes. Samphire thrives in the shallow, saline conditions, though a lagoon adjacent to Port Street has become eutrophic.

East and north (i.e. landward) of the town is the Hutt Lagoon. This extends from a point 1.5km north of Hutt River for about 15km northwards, impounded landward of a narrow area of parabolic and nested parabolic dunes.

South from Port Gregory to the Hutt River mouth, there are high, well vegetated parabolic and nested parabolic dunes behind the frontal dune, with two limited areas of revegetating sand sheets about 1 and 2km north of the river mouth.

The beach at Eagles Nest (at the entrance to Leander Reef) varies in position by >150m dependent on the sediment supply, mean sea level and wave climate.

Well vegetated parabolic dunes occur in the first 1.5km north from Port Gregory. The terrain then changes to partially barren deflation basins behind the frontal dune interspersed by shallow swamps leading into extensive sandsheets to the east. These sandsheets, which extend

almost 5km along the strip of land between the Hutt Lagoon and the ocean, are revegetating in the south but become increasingly exposed and mobile northwards. Similarly, frontal dunes which are well developed in the south become broken, lower and more sparsely vegetated northwards, opposite the sandsheets (Landvision and Shire of Northampton, 2006). The area north of Eagles Nest has retreated historically and the broader coast is vulnerable to salient migration, dune blowouts and sandsheet activity.

Additional information about this section of coast is included in Chapter 9.

## VEGETATION

The below vegetation description is based on the 2006 Coastal Strategy (Landvision and Shire of Northampton, 2006) for Port Gregory.

*Spinifex longifolius*, and, in the vicinity of the townsite, *Atriplex isatidea* are the most prominent species on the well vegetated frontal dune. A variety of other species are also found on the frontal dune including *Tetragonia decumbens* which is of secondary dominance in some areas, *Arctotheca calendula*, *Carpobrotus virescens*, *Salsola kali*, *Threlkeldia diffusa*, *Angianthus cunninghamiana*, *Senecio lautus*, *Isolepis nodosa*, *Cakile maritima*, and, on the crest and hind slopes, *Scaevola crassifolia*, *Olearia axillaris*, *Acacia rostellifera*, *Myoporum accuminatum* and *Rhagodia preissii*.

In the well vegetated secondary dunes behind the frontal dune, *Olearia axillaris*, *Acacia rostellifera*, *Myoporum accuminatum* and, to the north, *Acanthocarpus preissii* and *Rhagodia preissii* are prominent. The species found on the frontal dune are also found here, with the shrub storey more prominent and with invasive grasses and weeds in places.

In low lying, swampy areas behind the frontal dune to the north, *Sporobolus virginicus*, *Halosarcia* sp. and *Juncus* sp. are found. In neighbouring deflation basins and on adjoining sandsheets, *Olearia axillaris*, *Acacia rostellifera* and *Angianthus cunninghamiana* are noticeable amongst the sparse vegetation cover.

## HYDROLOGY

The Hutt River has the capacity to supply sediment to the sector, operating as a sediment sink or source (Eliot et al. 2013). The river mouth is barred, with sediment released during episodic floods and sediment captures during lower flows. During a period of flood, sediment is released from the bar, the broader accumulation area within the mouth and from the large dune east of the mouth that encroaches on the river during low flow periods. The Hutt River flows through largely cleared farming lands which increases the amount of sediment that may be discharged to the coast

during a flood. It is anticipated the floods of 1996, 1998, 1999 and 2000 discharged a large volume of sediment to the broader sediment cell that has partially contributed to the sedimentation within Port Gregory townsite. This is inferred from landform analysis undertaken to define sediment cells (Stul et al. 2014), flood records (Figure 9.12) and observations of beach widths and sediment on the reefs from aerial photography (Figure 9.11; Chapters 9.3 and 9.4).

The DBCA have advised that a small 'sublagoon' located within Hutt Lagoon is an important feeding area for migratory birds over the summer. Given the dramatic decline in some species of migratory birds over the last 20 years this site has considerable environmental and tourism value. Environmental management plans should also be prepared if necessary, recognising the site's considerable environmental value as a habitat for migratory birds.



Photo 10: Hutt River mouth showing the river in the foreground and the beach in the background (Land Insights, 2016)

## SOCIAL CHARACTERISTICS – LAND USE, ACCESS, FACILITIES AND HERITAGE

### PORT GREGORY

Port Gregory is a small coastal settlement supported by tourism, beta carotene production, fishing and holiday accommodation. The town is constrained from further expansion by the presence of the Hutt Lagoon inland and the steep, fragile dune systems of either side. It was designated as a Local Centre with a tourism focus and limited growth potential in the 2006 Coastal Strategy (Landvision and Shire of Northampton, 2006), as well as the Batavia Coast Strategy (Batavia Coast Coastal Planning Group and Landvision, 2001).

The town presently has a caravan park and a small holiday cottage complex. Adjoining the caravan park is a single

shop providing a local service. Public amenities consist of a toilet block and picnic and rest facilities overlooking the beach front. There is a bitumen carpark behind the beach and an informal gravel carpark on higher ground to its north to accommodate boat trailers. An oil waste receptacle is located within the gravel car park. It is understood to be used but requires regular cleaning and maintenance by the DoT. A recreation centre is located to the east of the town centre beside the lagoon.



Photo 11: Picnic and lookout area at Port Gregory car park (Land Insights, 2016)

A small jetty is located at the end of the beach vehicle access. Until recently, the jetty was accessible by boats (particularly cray fishing boats), however the beach has been accreting in recent years and now the jetty is situated in very shallow water and is now located on the beach. The Department of Transport have advised that during a site visit undertaken by the Department on 14/11/2011 members of the community stated that usage of the facility could be up to 5-10 vessels during the Western Rock Lobster season. Increased sedimentation at the jetty occurred from 2001 to 2012 (Figure 9.7), with refueling no longer possible from 2012.



Photo 12: Jetty at Port Gregory (from picnic area) (Land Insights, 2016)

launch site at low tide when there is a wide beach with a solid surface, but access is more difficult and the launch site can be congested at high tide, when the wide platform of hard sand is not available.

Tracks lead from the beach carpark through the dunes in a north-east direction to the shores of the Hutt Lagoon and north through high dunes and swales. The latter track continues northwards into a swale behind the frontal dune which it follows to extensive sandsheets. Numerous ancillary tracks meander across the swale and through the swamps, or travel at random into the sandsheets.

Vehicles can travel north along the beach from Port Gregory towards Halfway Bay and Lucky Bay. They can also travel south to a small swimming beach at Nobby's Hole and further south to the Hutt River mouth.

Hutt Lagoon has considerable tourism value as a unique attraction in the region. It is noted that tourists can sometimes stop along Northampton-Port Gregory Road and that it may be beneficial to direct traffic to Port Gregory so that tourists can view the lagoon from the western shores. It is recommended that a Minor Day-Use Plan is prepared for the lagoon. Environmental management plans should also be prepared if necessary, recognising the site's considerable environmental value as a habitat for migratory birds.

The remnants of an old whaling station are located in the dunes immediately north of Port Gregory. It was known as Pakington Whaling Station and was located at the site of the proposed Pakington townsite, behind the sand dunes of Hillock Point. Some narrow lots of UCL are reminders of the proposed townsite location. The following information is from the document Pakington Whaling Station (Rodrigues and Anderson, 2006). The whaling station operated from the mid-1800's right up to possibly the 1920's. It is also possible that the whaling parties in the 1800's lived on the lots identified as the townsite. A number of features were exposed after some strong winds in 2006 including remnants of a stone jetty, a pile of brick rubble and a stone floor of a built structure. Also found were ferrous metals, whalebone, glass, ceramics and oyster shells. The site is covered by coastal shrubs so the archaeological features are not immediately visible. However a 4WD track runs through the area which makes it possible that some disturbance could occur without knowing.

Port Gregory itself is also listed as a historic place in the Shire Municipal Inventory as place number 024, and also as place number 08916 by the Heritage Council of WA. It is described as a small coastal fishing / holiday town near the mouth of the Hutt River. The official plan had been to make Port Gregory a thriving port and community. However, as the mines did not continue to flourish for



**Photo 13: Hutt Lagoon, accessed via a track leading from the Port Gregory townsite (Land Insights, 2016)**

long, and Champion Bay became the new centre for the district, the town failed to grow. The port was not a safe or easy facility to use as there were dangerous reefs and initially construction of an adequate jetty was not possible with everything having to be floated to and from the ships (Heritage Council of WA, 2017).

## HUTT RIVER

The Hutt River mouth is 6km south of Port Gregory. It is a minor day-use site largely used by locals, or by those who know about the location of the access tracks. It is recommended that the site is kept low-key day use site and keeping access informal will help retain this status. Camping and overnight stay is not permitted.



**Photo 14: 'No Camping' signage at Hutt River (Land Insights, 2016)**

Pools in the lower reaches of Hutt River and the valley of the river provide an attractive recreational environment, while an area of mobile sandsheets over about 1.5km of coastline south of the river mouth are used by recreational off-road vehicles. At the time of inspection (November 2016), the river was not flowing through to the ocean. Local advice indicates the mouth is open only after significant rain. This area has considerable migratory shorebird feeding habitat.

Access to the Hutt River mouth is along the beach from Port Gregory (no tracks lead to the river from Port Gregory) or via four different access points along the bend in the Port Gregory Road. Three of these tracks are across private property and one leads from the Shire reserve R48584. Comment from Main Roads (MRWA) indicated some concern regarding the location of the access tracks on the bend in the road (which may not have the proper sightlines) and recommended that a traffic study be undertaken to determine an appropriate access point. All tracks are currently well-contained and do not seem to be causing erosion.



Photo 15: 4WD track leading to Hutt River (Land Insights, 2016)

The 2006 Strategy recommended that the eastern track would benefit from an upgrade to 2WD status, with provision for car parking and pedestrian access to the eastern four-wheel drive beach access. It is not recommended that these upgrades occur for the following reasons:

- Hutt River mouth has a variety of tenure (including a Shire-managed reserve, freehold and UCL). The eastern track passes through Shire reserve and freehold and the proposed location of the parking and pedestrian access would largely be on freehold, with some on UCL.
- Upgrades to any of the tracks would require a traffic impact assessment to determine if sightlines are appropriate, as well as agreement from MRWA

There is no formal carpark at the river mouth, merely informal parking at the end of the tracks on level ground by the river.

A number of Aboriginal cultural heritage sites and historic heritage places are located within the general area. Three Registered Aboriginal sites are located in the area (Lynton Station (4491), Graves (4732) and Hutt River (5672)) which



Photo 16: Quad bike at Hutt River (Land Insights, 2016)

are artefacts and scatter. There is potential that other Aboriginal Heritage sites may be identified in the future.

Lynton Convict Hiring Depot was established in 1853 to serve the Geraldine Mine and pastoralists (place number 01915 on the State Heritage Register). It is on the Register of National Estate, the State Register, listed by the National Trust and on the Shire's Municipal Register (Category 1A). The place is highly valued as a tourist attraction by the current owners. It served as an employment agency from which ticket-of-leave holders could be hired. Accompanying the ticket of leave holders were 9 Pensioner Guards. Several stone cottages are said to have been built to house the guards and their families. The site was abandoned on 1856 due to harsh conditions and problems with transporting ore from the mine. The ruins of the Pensioner Guard cottages are several kilometres to the west of the convict hiring station (Site No. 25) and Sanford's house (Site No. 26). They are listed in the Shire's municipal inventory (place number 08917 by the Heritage Council of WA) (Heritage Council of Western Australia, 2017).

## WHITE CLIFFS

White Cliffs is a low-key day use site accessed by a track leading from Port Gregory Road. The track crosses through freehold property. Closer to the coastline, some well-established tracks provide access to small informal parking areas and access to the beach. Tracks lead further south to other access points and lookouts. The coastal area is UCL. The tracks are located on both freehold and UCL. There is no development at this site and none is proposed as part of this Strategy. As this site is a mixture of freehold and UCL and the Shire does not control it, any issues regarding management are the responsibility of the landowner and DPLH.

### 3.2 SECTOR 2 – CONSULTATION FEEDBACK

Feedback from the community and stakeholders relating to this Sector is summarised below (further information is provided in Chapter 7):

- Port Gregory was the fourth most visited area (behind Lucky Bay, Horrocks and Halfway Bay)
- Issues at Port Gregory are siltation and sand accumulation (particularly around the jetty, car park and steps), wind protection at the BBQ area, oil receptable waste disposal in the gravel car park and cleaning of the BBQ area.
- Issues at Hutt River are overnight camping, rubbish and waste, protection of heritage values, access points from the road.
- The community suggested the need for management of rubbish, more ranger presence, signage, rehabilitation, ORV management, better facilities to keep the area largely as it is.

Comments from Government agencies include:

- NACC – The Hutt Lagoon is an important feeding ground for migratory shorebirds and NACC support community monitoring that contributes to national Birdlife Australia surveys.
- Department of Mines, Industry Regulation and Safety – The 2006 Strategy proposed a reserve was created across UCL at Hutt River which is also subject to a Live Tenement.
- Department of Biodiversity, Conservation and Attractions (formerly Department of Parks & Wildlife) - advises that the following Management Orders will not proceed without native title negotiations being completed: UCL (Location 11832) south of Hutt River mouth and the portion of Hutt Lagoon that is currently designated as UCL (between Port Gregory and Halfway Bay) and the area of UCL south of Hutt River excluding the portion of UCL over the beach.
- Main Roads WA - Out of the 4 access points, 1 access point should be formalised to provide access to Hutt River Mouth and the 3 remaining access points should be closed off and the road verge revegetated. Additionally, these access points are located on a bend in the road resulting in limited sight lines in either one or both directions. Consequently, a site investigation would need to be undertaken by Main Roads WA to determine whether any of the access points meets Main Roads WA sight distance requirements.

### 3.3 SECTOR 2 – ISSUES AND OPPORTUNITIES

A review of all issues and opportunities and how they have helped form the recommendations is provided below.

#### PORT GREGORY



Photo 17: Extent of Jetty at Port Gregory (Land Insights, 2016)



Photo 18: Sand accretion - Port Gregory Jetty (Land Insights, 2016)



Photo 19: Sand accretion at Port Gregory (Land Insights, 2016)

A review of all issues and opportunities for Sector 2 is provided in the table below and displayed on Figure 3.1 where applicable.

**Table 3.1 – Issues and opportunities – Sector 3**

Issues	Opportunities
<b>Port Gregory</b>	
<p>Tenure along the beach and foreshore area is largely UCL, including a portion of the car park and the BBQ/picnic area. The beach access, jetty, gravel and bitumen car park is a reserve vested with the Department of Transport (R36615). The only reserve vested with the Shire is a small reserve inland from the car park which has the public toilets (R50063).</p>	<p>There may be opportunities for the Shire to seek the Management Orders for a portion of the UCL along the Port Gregory foreshore as a reserve for recreation. This will need to be discussed further with Native Title claimants. In particular, the Shire could focus on the UCL adjacent to the Port Gregory townsite (which may require the creation of new coastal reserves excised from the existing UCL). The intention is not to apply for the management orders for the whole foreshore but only for certain areas required to provide facilities and access. The exact area will need to be further considered by the Council.</p>
<p>Accretion of sand on the beach and around jetty which can no longer be used to dock boats or for refuelling. This has serious implications on local crayfishermen who can no longer refuel at the jetty. It is interesting to note that the 2006 Coastal Strategy and 2001 Batavia Coast Strategy stated that the narrow beach at Port Gregory caused some land use conflicts between swimmers, fishermen and vehicles during peak periods. This issue may have been lessened by the widening of the beach in recent years.</p>	<p>Investigate options for making improvements to the jetty. Two options have been suggested to allow for the ability to refuel from the jetty again. One option is to seek funding for a jetty extension. If an extension to the jetty is pursued the feasibility of sourcing funding from the Department of Transport or from external funds should be considered. The ownership and liability implications for private funding to extend a public asset should be investigated. A second option is to place a pontoon at the jetty given the jetty has greater structural integrity than original designed due to 5m vertical sand accumulation. The feasibility and expense of this option should be investigated further.</p>

Issues	Opportunities
<p>Beach user conflict during peak periods, especially holidays. This is as a result of an increase in visitors and different users along the beach. One of the more serious land use conflict is between swimmers and vehicles on the beach which has safety implications.</p>	<p>This issue can be managed through driver education, encouraging drivers to drive slowly and signage to make all users aware of the issue.</p>
<p>An oil waste receptacle is located within the gravel car park, to the north of the bitumen car park. Quite a bit of rubbish is stored here and locals are unsure of whether it will be cleaned any time soon. This parcel of land has management orders with the Department of Transport. There may also be site contamination issues as a result of this facility.</p>	<p>It is recommended that the Shire contact the Department of Transport to clear the waste, remediate the site and maintain it in the future.</p>
<p>Maintenance of the public toilets and barbeque/picnic area. The Shire currently funds cleaning of the public toilets and BBQ area. Although the public toilets are situated on the Shire reserve, the BBQ and picnic area is located on UCL (management authority is the DPLH). Maintenance of the shelters is required as these are currently falling apart.</p>	<p>It is recommended that the Shire continue to maintain and clean the toilets and picnic/barbeque area by supporting locals to undertake this work. There may also be opportunity to seek vesting of a small amount of UCL along the Port Gregory foreshore which includes the BBQ and picnic area. This would allow the Shire to carry out maintenance work on the shelters and BBQ.</p>
<p>It has been suggested that some shade and wind protection is required at the picnic area. While the picnic area offers great views of the beach, it is currently unprotected from winds.</p>	<p>It is recommended that some shade or wind protection is provided, or the picnic area moved to a more sheltered area.</p>

Issues	Opportunities
<p>Access to the beach south of Port Gregory (Nobbys Hole) has changed in recent years as a result of changes to the coastal landscape. A track used to exist behind the primary dunes, however the track has now gone and vehicles now have to drive along the beach. This could have implications on land use conflicts with other beach users (as discussed above). Vehicles sometimes travel along another track leading from town, however this is across UCL and should preferably be located within a Shire-managed reserve to allow for the Shire to create and maintain the track.</p>	<p>It may be possible for vehicles to drive along the beach as long as some management is provided (as discussed above). It will also be possible for the Shire to create a track once a portion of the foreshore area is excised from UCL and placed in a Shire-managed coastal reserve.</p>
<p>Uncontrolled 4WD vehicle access through the dunes can lead to track duplication and dune erosion.</p>	<p>New tracks should be closed as soon as they form and people encouraged to drive along formed tracks. Access to the north will also ideally be restricted to the beach and existing tracks only.</p>
<p>There are no boat launching facilities at Port Gregory and launching is difficult if not familiar with local site conditions. Locals are aware of the conditions and can launch boats off the beach. The 2006 Coastal Strategy recommended that a boat launching facility be constructed to assist with launching boats off the beach. Discussion with locals indicated that they don't have much issue launching boats off the beach, however visitors and tourists might experience some issues. There is a limited area of beach available at high tides in winter and soft sand in summer, thus being largely unsuitable for two-wheel drive vehicles. In addition, any fixed infrastructure in this location is vulnerable to erosion from storms during periods of retreat and accretion during periods of erosion.</p>	<p>Better signage may need to be installed to educate tourists and visitors of the difficulties in boat launching and where the best locations are.</p>

Issues	Opportunities
<p>The Port Gregory townsite comprises of a few locals who reside in the town full-time. Many of the houses are holiday homes and a caravan park provides accommodation for visitors. During peak periods the town is full and this can lead to a few issues typically associated with busy periods such as demand for facilities, anti-social behaviour and rubbish.</p>	<p>Port Gregory has limited capacity for expansion because of the surrounding landscape features. There is also limited opportunity for camping outside of the caravan park. Therefore the numbers at Port Gregory even during peak periods are usually somewhat capped. This may make it easier to plan and manage for peak times.</p>
<p>The protection of heritage sites, in particular the Pakington Whaling Station and old townsite which is located north-west of Port Gregory. A 4WD track runs through this area unwittingly leading to damage of the site. It is also located on UCL and therefore the responsibility of the DPLH.</p>	<p>The site is located on UCL, however management of 4WD tracks through the area would help reduce disturbance.</p>
<p>Townsite expansion. Port Gregory is surrounded by natural features which limit further townsite expansion. This places a limit on the number of tourists and visitors can visit the area.</p>	<p>The limit on the number of permanent residents and visitors is particularly useful during peak season as means the area does not become overcrowded and severely degraded as a result.</p>
<p>Dune and vegetation degradation. The dunes around the car park have previously been revegetated to control erosion and damage caused by pedestrian traffic.</p>	<p>Pedestrians and vehicles should be encouraged to keep to existing tracks and accessways and to keep off vegetated dunes.</p>

Issues	Opportunities
<b>Hutt River</b>	
Hutt River has a variety of tenure. It is primarily a mixture of freehold and UCL. A Reserve along the eastern side along the river (R48584) has its management orders with the Shire for the purpose of 'foreshore protection'. The landowners of the freehold portion try to manage the site by erecting signage to advise that camping is not permitted and undertake regular rubbish clean ups.	As the Shire is unlikely to purchase the freehold land, or seek management orders for the UCL, issues associated with the existing tenure arrangement cannot be fully resolved. The Shire should continue to support and appreciate the efforts of landowners of the freehold titles and traditional landowners in managing this site. Management recommendations in this Strategy focus on the Shire-managed reserve. A majority of Hutt River is in private ownership or UCL and the Shire supports its continued use as a low key day use site only. The Shire is unlikely to approve any further development at Hutt River.
Four access points currently exist within a short space along Port Gregory Road. These access points are located in a bend in the road and sightlines could possibly be poor and there could be potential safety issues.	A traffic impact statement could be undertaken for the site to do a proper review of sightlines and vehicle safety. The safest access option could be chosen and the other points closed.
Illegal camping is known to take place at this site occasionally despite signs being erected on the access tracks to advise that it is a day use site only. This causes issues in terms of rubbish, human waste and liability implications. The landowner of the freehold property will occasionally inspect the site and clean up rubbish.	If a traffic study is undertaken and all access points closed except for one this could help manage access and illegal camping. The Shire could assist with the erection of signage within Reserve R48584 to advise visitors. Hutt River should remain as a low key day use site only. The Shire is unlikely to approve development at Hutt River.
As is explained above, rubbish is also an issue at Hutt River from both campers and day users.	The Shire can assist the landowners with this issue by supporting community beach clean up days which can include this site, and through the provision of signage within reserve R48584 to ask visitors to take rubbish home.

Issues	Opportunities
Some dune degradation south of the Hutt River mouth is occurring from uncontrolled vehicle access.	Signage can be erected within the Shire reserve R48584 to advise vehicles to keep to existing tracks.
Variability in landforms and managing community expectation with regards to beach infrastructure.	Ensure effective communication with the community with regards to coastal variability and infrastructure.

### 3.4 SECTOR 2 – RECOMMENDED ACTIONS

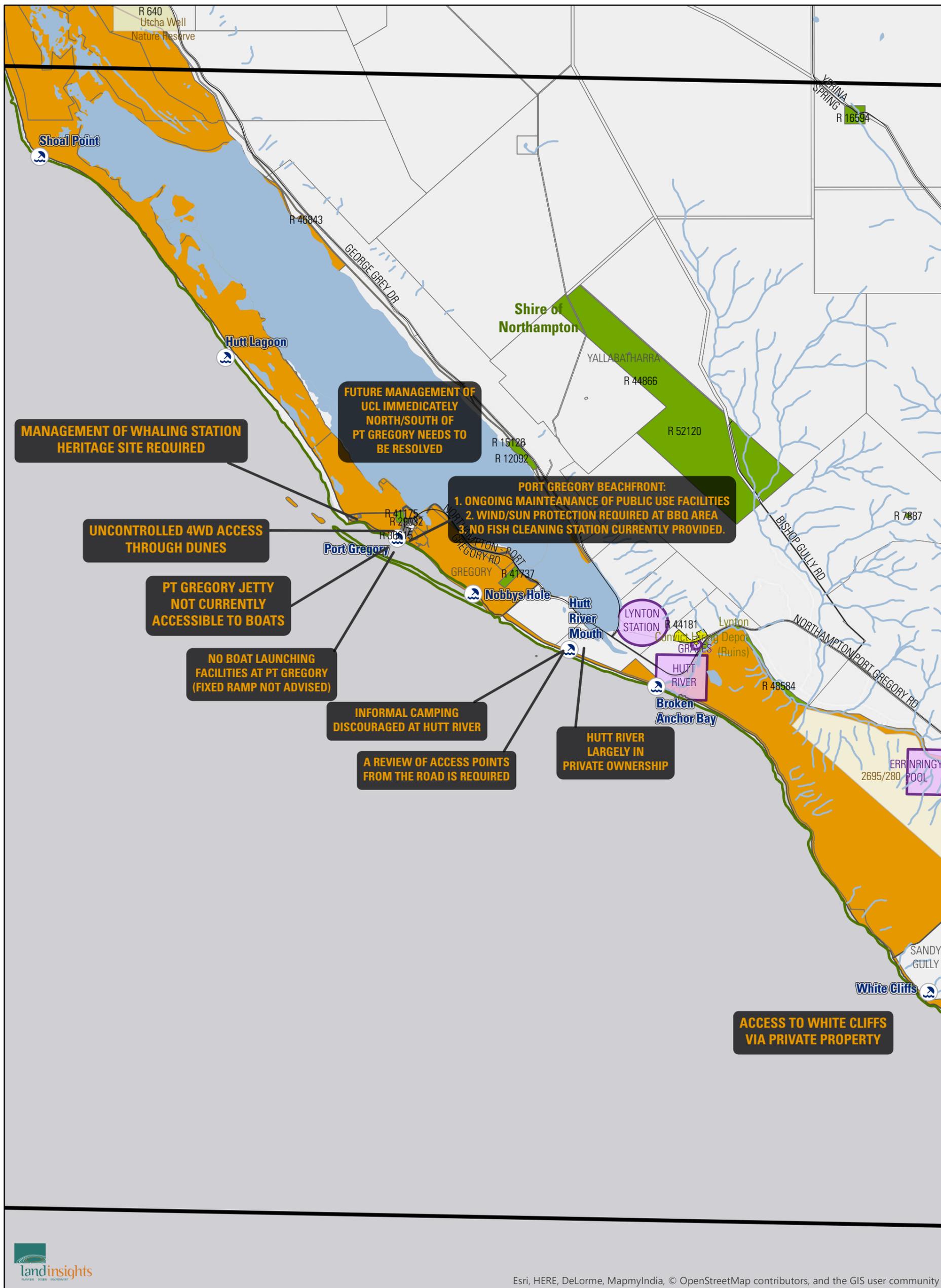
The recommended actions for Sector 2 are listed in the table below and shown on Figures 3.2 – 3.4.

**Table 3.2 – Sector 2 Recommended Actions**

<b>Action #</b>	<b>Description</b>	<b>Priority</b> S – Short M – Medium L – Long O – Ongoing	<b>Responsibility</b>
<b>Port Gregory</b>			
PG1	Determine an area of foreshore along the Port Gregory coast to be excised from UCL and placed in a Shire-managed reserve for the purpose of recreation. The reserve could include the picnic/BBQ area at the car park and a portion of the foreshore in front of the car park.	S	SoN, DPLH, Landgate, Native Title claim groups
PG2	Address land use conflict between vehicles on the beach and other beach users through driver education, encouraging drivers to drive slowly and signage to make all users aware of the issue.	S	SoN DoT
PG3	Contact the Department of Transport to clear the waste within Reserve R36615 and remediate the site. Department of Transport to maintain the site.	S	SoN DoT
PG4	Continue to support locals who maintain and clean the toilets and picnic/ barbeque area.	S	SoN
PG5	Provide some shade or wind protection at the BBQ in the car park or relocate the picnic and BBQ area to a more sheltered area (e.g. permanent shelters with solid roofing that is sloped against the prevailing winds; seasonal commercial grade shade sails or shade cloth; install a better wall around the BBQ area to provide protection etc.)	S-M	SoN DPLH
PG6	New 4WD tracks should be closed as soon as they form and people encouraged to drive along existing tracks. This can be achieved through signage, brushing tracks or blocking with boulders etc.	O	SoN DPLH
PG7	Access south from Port Gregory to Hutt River should remain confined to the beach or sealed inland roads.	O	SoN DPLH
PG8	Access to the north should be restricted to the beach and existing tracks only.	O	SoN
PG9	Install signage to educate tourists and visitors of the difficulties in boat launching and where the best locations are.	S	SoN DoT
PG10	Encourage pedestrians to keep to existing tracks and accessways and to keep off vegetated dunes by, for example, fencing dunes within the townsite to direct pedestrians to formal tracks, and the installation of low level signage to describe the vegetation and provide the rationale for dune protection.	O	SoN

Action #	Description	Priority S – Short M – Medium L – Long O – Ongoing	Responsibility
PG11	Develop a plan for moving beach huts in Port Gregory as the beach position and dune position changes on the variability beach linked to management triggers. The method of construction should be reviewed to allow for mobility and avoid any concrete slabs at the base.	M	SoN DPLH
PG12	<p>Attempt to reduce aeolian sediment transport into car park, stairs, ramp and BBQ area through a series of measures:</p> <p>a) East – install a sand node covered with brush immediately east of the jetty access to trap sand, widening and thickening the dunes. Next phase if this is unsuccessful is sand fencing.</p> <p>b) North West access – Reform the dune and restrict 4WD from cutting the corner to reduce drift from the west. Dune to be reformed using sand from Item c) below and stabilised with light brushing.</p> <p>c) West of jetty – Excavate sand immediately west of jetty along landward third of jetty to allow sand to pass under the jetty. Sand to be used to reform dune in Item b).</p> <p>d) Ongoing sand removal from the car park and access road. Implementation of Items a) to c) above will assist in reducing work required for Item d).</p>	S	SoN DoT
PG13	If the coast enters an erosive phase the above recommendations will need to be reviewed and modified.	L	SoN DoT
PG14	Once the Shire-managed reserve is created along the Port Gregory foreshore, create a new access track to allow vehicles access south of the town.	M-L	SoN
PG15	<p>Investigate the feasibility and cost to provide capacity for refuelling from the jetty by either:</p> <ul style="list-style-type: none"> <li>• Source private funds for extending the jetty.</li> <li>• Place a pontoon at the jetty given the jetty has greater structural integrity than original designed due to 5m vertical sand accumulation.</li> </ul>	S	SoN DoT
PG16	Avoid fixed permanent infrastructure for boat launching due to beach position variability.	O	SoN DoT
PG17	Prepare a Port Gregory townsite Coastal Hazard Risk Management and Adaptation Plan (CHRMAP).	M	SoN DPLH
PG18	A heritage and archaeological assessment of the Pakington Whaling Station should be undertaken to determine the significance, condition and potential for damage and whether site stabilisation work is required. The assessment should also determine the extent and distribution of artefacts over the site to determine if there are remains of one or two whaling stations in the area.	M-L	SoN DPLH

<b>Action #</b>	<b>Description</b>	<b>Priority</b> S – Short M – Medium L – Long O – Ongoing	<b>Responsibility</b>
PG19	If the Pakington Whaling Station is found to have significant local values (as a result of PG18) it is to be included on the Shire of Northampton Municipal Inventory and a request is made with the Maritime Archaeological Advisory Committee that Port Gregory/Pakington Whaling Station is recognised by the CEO of the Western Australian Museum as a maritime archaeological site under the state Maritime Archaeological Act 1973.	M-L	SoN DPLH WA Museum
PG20	Prepare an Environmental Management Plan for Hutt Lagoon and a minor day-use plan for sites adjacent to Port Gregory.	M-L	DPLH DBCA
<b>Hutt River</b>			
HR1	Retain Hutt River Reserve R48584 as a minor day use recreation site.	S	SoN DPLH
HR2	Avoid locational and directional signage on the road to keep the site low-profile.	O	SoN
HR3	Undertake a traffic safety review of the access tracks leading to the site, including a review of sightlines and consideration of consolidating access to a single entry/exit point.	S	SoN MRWA
HR4	Review access arrangements (i.e. close dangerous access points and open new access points if required) depending on the results of the traffic study.	M	SoN MRWA
HR5	Continue to liaise with the landowners and native title holders to discuss any issues and opportunities which may arise.	O	SoN Landowners Native title parties.
HR6	Continue the prohibition of camping within Reserve R48584.	O	SoN
HR7	Erect signage within Reserve R48584 to advise visitors that camping is not permitted, to encourage visitors to take rubbish home and to encourage vehicles to keep to existing tracks and not to drive through dunes.	S	SoN
HR8	Assist with rubbish issues by supporting community beach clean up days.	O	SoN
<b>White Cliffs</b>			
WC1	Maintain as a low-key site with no facilities or infrastructure.	O	SoN DPLH



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-  Beaches
-  Shire of Northampton Boundary
-  Localities
-  Other Local Governments
-  Water Feature
-  Sector Boundaries
-  DPAW Managed Land
-  Registered Aboriginal Sites

- Tenure**
-  Reserve
  -  Other (UCL)
  -  Other Tenure (inc Freehold)
  -  State Heritage Register of WA

  
Scale 1:80,000



Figure 3.1 - Opportunities & Issues  
SECTOR 2 - HUTT LAGOON TO WHITE  
**Coastal Management Strategy**

PG1: Determine an area of foreshore along the Port Gregory coast to be excised from UCL and placed in a Shire-managed reserve for the purpose of recreation. The reserve could include the picnic/BBQ area at the car park and a portion of the foreshore in front of the car park. Address land use conflict between vehicles on the beach and other beach users through driver education, encouraging drivers to drive slowly and signage to make all users aware of the issue.

PG2: Address land use conflict between vehicles on the beach and other beach users through driver education, encouraging drivers to drive slowly and signage to make all users aware of the issue.

PG3: Contact the Department of Transport to clear the waste within Reserve R36615 and remediate the site. Department of Transport to maintain the site.

PG4: Continue to support locals who maintain and clean the toilets and picnic/barbeque area.

PG5: Provide some shade or wind protection at the BBQ in the car park or relocate the picnic and BBQ area to a more sheltered area (e.g. permanent shelters with solid roofing that is sloped against the prevailing winds; seasonal commercial grade shade sails or shade cloth; install a better wall around the BBQ area to provide protection etc.)

PG6: New 4WD tracks should be closed as soon as they form and people encouraged to drive along existing tracks. This can be achieved through signage, brushing tracks or blocking with boulders etc. Avoid creation of any new access tracks in the dunes at Port Gregory to minimise dune destabilisation.

PG7: Access south from Port Gregory to Hutt River should remain confined to the beach or sealed inland roads.

PG8: Access to the north will be restricted to the beach and existing tracks only.

PG9: Install signage to educate tourists and visitors of the difficulties in boat launching and where the best locations are.

PG10: Encourage pedestrians to keep to existing tracks and accessways and to keep off vegetated dunes by, for example, fencing dunes within the townsite to direct pedestrians to formal tracks, and the installation of low level signage to describe the vegetation and provide the rationale for dune protection.

PG11: Develop a plan for moving beach huts in Port Gregory as the beach position and dune position changes on the variability beach linked to management triggers. The method of construction should be reviewed to allow for mobility and avoid any concrete slabs at the base.

PG12: Attempt to reduce aeolian sediment transport into car park, stairs, ramp and BBQ area through a series of measures:

- a) East – install a sand node covered with brush immediately east of the jetty access to trap sand, widening and thickening the dunes. Next phase if this is unsuccessful is sand fencing.
- b) North West access – Reform the dune and restrict 4WD from cutting the corner to reduce drift from the west. Dune to be reformed using sand from Item c) below and stabilised with light brushing.
- c) West of jetty – Excavate sand immediately west of jetty along landward third of jetty to allow sand to pass under the jetty. Sand to be used to reform dune in Item b).
- d) Ongoing sand removal from the car park and access road. Implementation of Items a) to c) above will assist in reducing work required for Item d).

PG13: If the coast enters an erosive phase the above recommendations will need to be reviewed and modified.

PG14: Once the Shire-managed reserve is created along the Port Gregory foreshore, create a new access track to allow vehicles access south of the town.

PG15: Investigate the feasibility and cost to provide capacity for refuelling from the jetty by either:

- a) Source private funds for extending the jetty.
- b) Place a pontoon at the jetty given the jetty has greater structural integrity than original designed due to 5m vertical sand accumulation.

PG16: Avoid fixed permanent infrastructure for boat launching due to beach position variability.

PG17: Prepare a Port Gregory townsite CHRMAP.

PG18: A heritage and archaeological assessment of the Pakington whaling station should be undertaken to determine the significance, condition and potential for damage and whether site stabilisation work is required. The assessment should also determine the extent and distribution of artefacts over the site to determine if there are remains of one or two whaling stations in the area.

PG19: If the Pakington Whaling Station is found to have significant local values (as a result of PG18) it is to be included on the Shire of Northampton Municipal Inventory and a request is made with the Maritime Archaeological Advisory Committee that Port Gregory/Pakington whaling station is recognised by the CEO of the Western Australian Museum as a maritime archaeological site under the state Maritime Archaeological Act 1973.

PG20: Prepare an Environmental Management Plan for Hutt Lagoon and a minor day-use plan for sites adjacent to Port Gregory.



Water Feature

Scale 1:7,500



Figure 3.2 - Site Plan  
PORT GREGORY  
Coastal Management Strategy



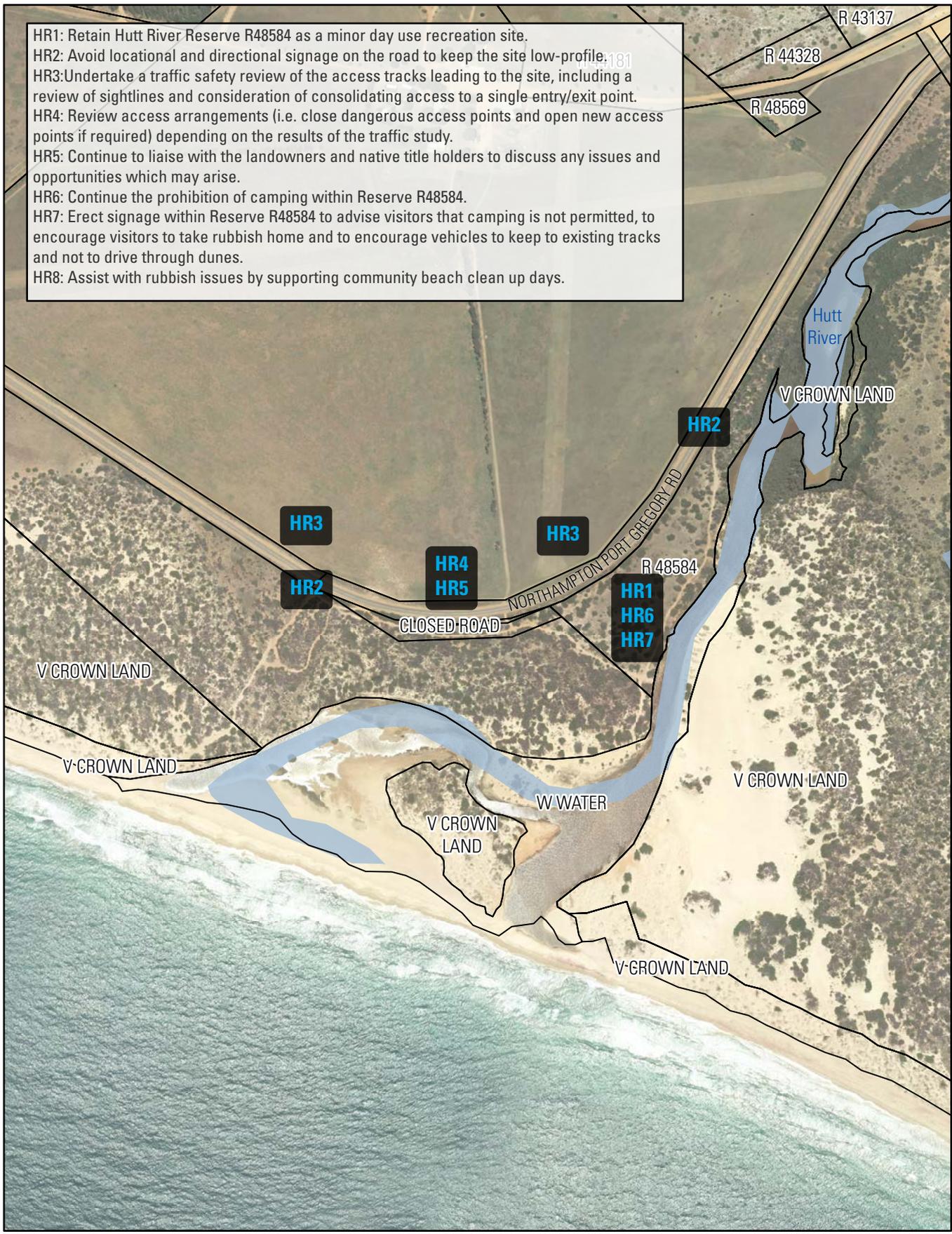
- Dune Reformation and Rehabilitation
- Sand Harvest Areas

  
 Scale 1:2,000



Figure 3.3- Site Plan  
 PORT GREGORY - TOWNSITE INSET  
**Coastal Management Strategy**

HR1: Retain Hutt River Reserve R48584 as a minor day use recreation site.  
 HR2: Avoid locational and directional signage on the road to keep the site low-profile.  
 HR3: Undertake a traffic safety review of the access tracks leading to the site, including a review of sightlines and consideration of consolidating access to a single entry/exit point.  
 HR4: Review access arrangements (i.e. close dangerous access points and open new access points if required) depending on the results of the traffic study.  
 HR5: Continue to liaise with the landowners and native title holders to discuss any issues and opportunities which may arise.  
 HR6: Continue the prohibition of camping within Reserve R48584.  
 HR7: Erect signage within Reserve R48584 to advise visitors that camping is not permitted, to encourage visitors to take rubbish home and to encourage vehicles to keep to existing tracks and not to drive through dunes.  
 HR8: Assist with rubbish issues by supporting community beach clean up days.



- Dune Reformation and Rehabilitation
- Sand Harvest Areas
- Water Feature

  
 Scale 1:7,500



Figure 3.4 - Site Plan  
 HUTT RIVER MOUTH  
**Coastal Management Strategy**

# 4.0 SECTOR 3 – WOOLAWAR GULLY TO OAKABELLA CREEK



## 4.1 DESCRIPTION

### PLANNING CONSIDERATIONS – TENURE AND ZONING

The section of the coast along Sector 3 is zoned General Rural with a narrow strip Reserved as Parks and Recreation along the coast. It is also included within Special Control Area SCA 1 – Coastal Planning and Management.

Sector 3 is predominantly freehold with a narrow strip of UCL along beach. Freehold areas are the responsibility of the landowner. UCL is the responsibility with DPLH, but subject to native title claim and no current active management body. This sector is a mixture of freehold and UCL and the Shire does not control it. Any issues regarding management to be directed towards the landowner and DPLH.

### ENVIRONMENTAL CHARACTERISTICS – LANDFORM, COAST AND VEGETATION

#### COASTAL LANDFORMS

This sector is located wholly within the primary sediment cell of Glenfield to Whale Boat Cove and mostly within tertiary sediment cell of Coronation Beach to Bowes River (Stul et al. 2014), excluding the Coronation Beach area. Coastal landforms in this area are mapped and presented in Eliot et al. (2013) in Figure C-23. The coast is a largely cliffed coast with degraded scarps and parabolic dunes fronting the cliffs. The cliffs are approximately 200m landward of the beach. Beaches are perched on broad limestone platforms of variable heights along the coast. Beach width varies seasonally and interannually dependent on mean sea level, storminess and sediment supply from the creeks/ rivers.

Beaches along this foreshore are approximately 5 to 25m wide, backed by low moderately-vegetated foredunes and dunes to landward. The foredunes are intersected or backed by a series of uncontrolled ORV tracks. Two areas of dune activation have occurred landward of the ORV tracks with a lack of vegetation for approximately 30m widths.

The foreshore area is wider at the barred entrances of Oakabella Creek and Woolawar Gully

No information on river flood levels is available through conventional sources and it would be desirable, as far as practical, to seek to establish some indication of flood levels through local knowledge and anecdotal evidence, or simple flood calculations. This would be useful to get an indicator of the potential contribution of sediment to the coast from these creeks and for us in emergency management planning if there is increased recreational use along this coast.

To the south, Coronation Beach is located on a salient perched on a broad reef platform, with sediment accumulation partially fed from the Oakajee River to the south. The beach width is dependent on intermittent supply of sediment from Oakajee River and on avoiding any interruption of sediment transport from the south.

Additional information about this section of coast is included in Chapter 9.

### SOCIAL CHARACTERISTICS – LAND USE, ACCESS, FACILITIES AND HERITAGE

Oakabella Creek and Woolawar Gully offer attractive sites for camping. In the long term, provision for this might be considered at each, with designation of campsites in sheltered situations amongst the dunes or near the gully mouths, endeavouring to contain such camping rather than allowing it to occur at random. Such initiative would clearly require that portions of freehold properties be excised and vested in the Shire which would then assume development and management responsibilities. This is not likely to occur for the lifetime of this Strategy (i.e. over the next 10 years). In the meantime, the Shire has no management responsibilities over this Sector as it is either freehold or UCL.

The river mouth areas are popular locations for fishing and surfing with associated camping activities being typically confined to the dunal areas in the lee of the bay. The section of coast between Oakabella Creek and Woolawar Gully is popular for surfing, which may include associated camping activities.

Traffic in this part of the coast is presently confined to a single north-south track, duplicated between Woolawar Gully and Oakabella Creek. While this track is within freehold land for most of its length, its use cannot remain ignored and unmanaged in the long-term if environmental damage is to be avoided or minimised. Vehicle activity here does not appear to be causing major damage at present, but there are evident exits from the north-south track into barren dunal terrain north of Woolawar Gully, as well as arbitrary exits through the frontal dune to the beach.

## 4.2 SECTOR 3 – COMMUNITY CONSULTATION FEEDBACK

Only a limited number of comments were received specifically about Woolawar Gully and Oakabella Creek. Some issues were discussed with the landowners of the freehold land at these sites. The comments received were mostly about vehicle access on the beach and the need to help manage this. There are problems associated with

vehicles getting bogged (as the sand can be very soft along the beach) and issues associated with the high tide which can result in submerged vehicles. They suggested better signage in the area (along the 4WD tracks extending north and south) and driver education.

### 4.3 SECTOR 3 – ISSUES AND OPPORTUNITIES

A review of all issues and opportunities and how they have helped form the actions are described in the table below and also displayed on Figure 4.1. These issues were identified based on a literature review, meeting with the residents, and results of a community survey. It should also be noted that the issues, opportunities and recommendations were also identified in the Shire of Chapman Valley Coastal Management Strategy and Action Plan (Land Insights and Shire of Chapman Valley, 2016). The recommended actions have also been based on the Chapman Valley report.

Issues	Opportunities
The main hazard associated with remote camping within floodways is the risk of inundation due to high rainfall and flooding. The information available on the topic of inundation is limited.	Signs should be located in these areas to warn coastal users of the risks and the emergency evacuation plan.

**Table 4.1 – Sector 3 Issues and Opportunities**

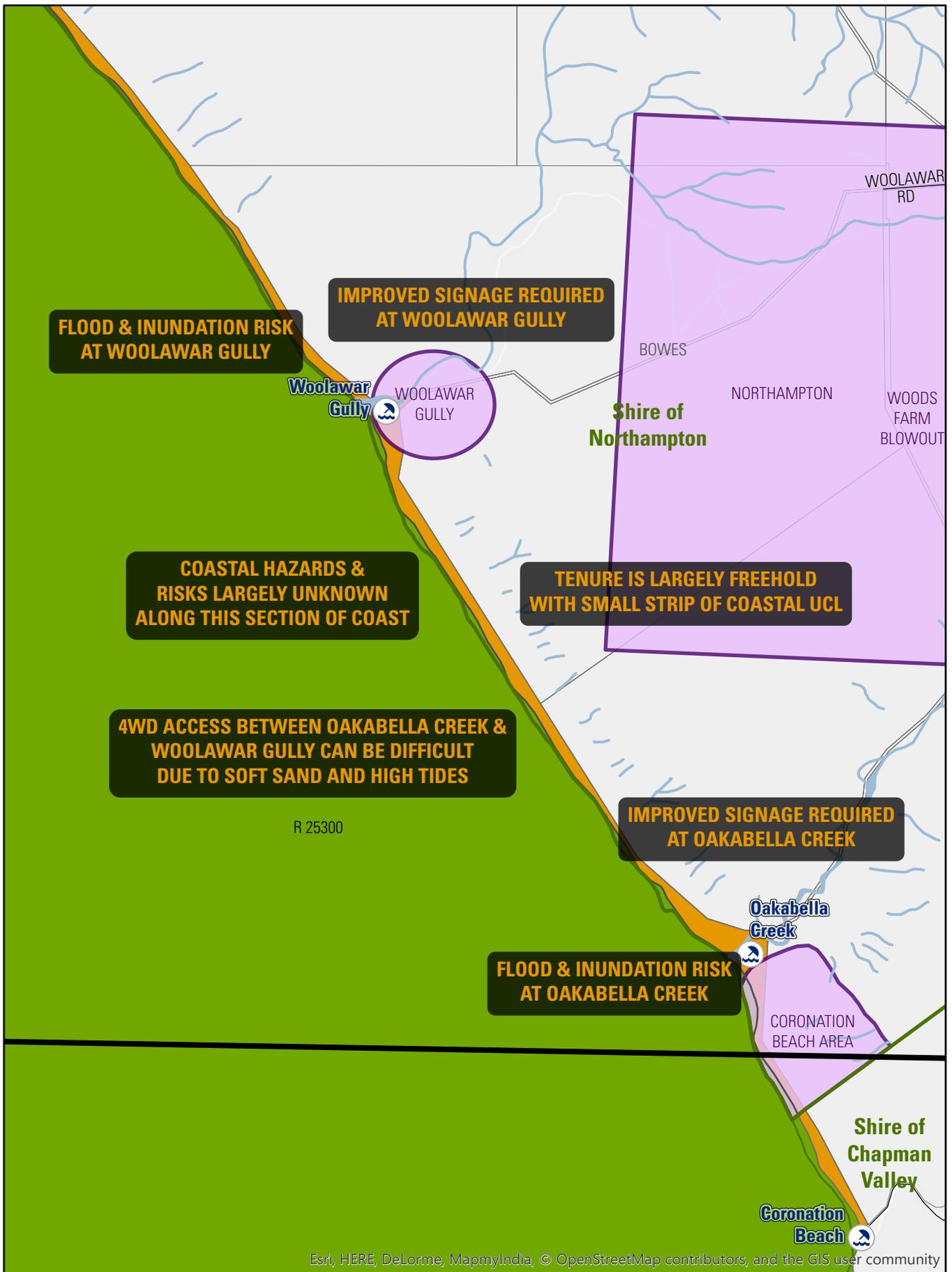
Issues	Opportunities
Tenure is a mixture of freehold and UCL and the Shire has no management responsibilities for this Sector.	Identification of issues which can be managed and addressed by landowners and the DPLH.
Access to Woolawar Gully and Oakabella Creek is via 4WD tracks through the foredunes leading north and south of the site.	Track management should be undertaken to close duplicate tracks and to ensure tracks are safe.
The remote nature of the site.	Woolawar Gully and Oakabella Creek is valued for its remote nature and wilderness camping. Creating a formal camp site will change the nature of the area.
Increased visitation in the long term could result in management issues.	The Shire can continue to communicate with the landowners and DPLH responsible for this Sector.
Rubbish and environmental damage can occur if the area is not actively managed and all responsibility falls on the adjoining private landowner.	Care by community groups and locals will help create a sense of ownership and responsibility.
Coastal hazards and risks. There is no detailed information on the possible impact of sea level rise, coastal erosion and inundation.	A CHRMAP could be prepared for the entire study area as a long term action, however there are other sites such as Port Gregory which have priority for a CHRMAP.

#### 4.4 SECTOR 3 – RECOMMENDED ACTIONS

Recommended actions relating to Sector 3 are outlined in the table below. They are also displayed on Figures 4.2 (Woolawar Gully) and 4.3 (Oakabella Creek).

**Table 4.2 – Sector 3 Recommended Actions**

<b>Action #</b>	<b>Description</b>	<b>Priority</b> S – Short M – Medium L – Long O – Ongoing	<b>Responsibility</b>
01	Retain Oakabella Creek and Woolawar Gully as a 'wilderness' camping areas and for low-key recreational use.	O	DPLH, private landowners
02	Investigate opportunities to provide signage in relation to camping at both Woolawar Gully and Oakabella Creek. Consider whether signage is to restrict and/or regulate camping where appropriate. Signage should state that the camping is not permitted during winter and provide flood hazard data (if available).	O	Landowners, DPLH
03	Include signage at appropriate locations along the beach and 4WD tracks which warn drivers of the high tide and soft sand which may cause bogging.	S	Landowners, DPLH
04	Clean up rubbish along sections of the beach where required.	O	Landowners, DPLH



**FLOOD & INUNDATION RISK AT WOOLAWAR GULLY**

**IMPROVED SIGNAGE REQUIRED AT WOOLAWAR GULLY**

**COASTAL HAZARDS & RISKS LARGELY UNKNOWN ALONG THIS SECTION OF COAST**

**TENURE IS LARGELY FREEHOLD WITH SMALL STRIP OF COASTAL UCL**

**4WD ACCESS BETWEEN OAKABELLA CREEK & WOOLAWAR GULLY CAN BE DIFFICULT DUE TO SOFT SAND AND HIGH TIDES**

**IMPROVED SIGNAGE REQUIRED AT OAKABELLA CREEK**

**FLOOD & INUNDATION RISK AT OAKABELLA CREEK**

- Beaches
- Shire of Northampton Boundary
- Localities
- Other Local Governments
- Water Feature
- Sector Boundaries

- DPAW Managed Land
- Registered Aboriginal Sites
- Tenure**
- Reserve
- Other (UCL)
- Other Tenure (inc Freehold)

Scale 1:40,000

Simply Remarkable

Figure 4.1 - Opportunities & Issues  
 SECTOR 3 - WOOLAWAR GULLY TO OAKABELLA CREEK  
**Coastal Management Strategy**



Water Feature

Scale 1:5,000



Figure 4.2 - Site Plan  
WOOLARWAR GULLY  
**Coastal Management Strategy**



O1: Retain Oakabella Creek and Woolawar Gully as a 'wilderness' camping areas and for low-key recreational use.

O2: Investigate opportunities to provide signage in relation to camping at both Woolawar Gully and Oakabella Creek. Consider whether signage is to restrict and/or regulate camping where appropriate. Signage should state that the camping is not permitted during winter and provide flood hazard data (if available).

O3: Include signage at appropriate locations along the beach and 4WD tracks which warn drivers of the high tide and soft sand which may cause bogging.

O4: Clean up rubbish along sections of the beach where required.

V CROWN LAND

R 25300

Water Feature

Scale 1:5,000



Figure 4.3 - Site Plan  
OAKABELLA CREEK

**Coastal Management Strategy**

# 5.0 GENERAL RECOMMENDED ACTIONS



## 5.1 INTRODUCTION

Further recommendations are provided below which apply throughout the study area rather than one specific site (unlike the recommendations provided above). They have been described as ‘general recommendations’. A majority have ‘ongoing’ priority as they are actions which should continue to be implemented throughout the duration of this Management Strategy and beyond in order to achieve good coastal management outcomes.

## 5.2 ACTIONS

Action #	Description	Priority S – Short M – Medium L – Long O – Ongoing	Responsibility
G1	<p>Give due regard to SPP 2.6 for the planning of any coastal facilities or development following the management and adaptation hierarchy of avoid-retreat-accommodate-protect. The location of coastal facilities and development should consider:</p> <ul style="list-style-type: none"> <li>• coastal processes,</li> <li>• appropriate coastal setbacks are implemented</li> <li>• any fixed infrastructure is built to the appropriate standard over an appropriate planning timeframe and can accommodate the anticipated range of beach and dune variability.</li> </ul> <p>It is recommended most assets on this coast are placed with consideration of how to accommodate the variability in beach position and dunes and allow for retreat where feasible. This is particularly relevant for recreational assets with finite lifespans and coastally dependent and easily relocatable assets noted in Sections 7.1 and 7.2 of SPP2.6 respectively.</p>	O	SoN,  DPLH
G2	Conduct regular monitoring of infrastructure and recreational facilities along the beach.	O	Responsible land managers
G3	Undertake a Coastal Hazard and Risk Management Adaptation Plan (CHRMAP) for the study area, including the consideration of trigger levels for actions with respect to sea level rise, coastal inundation/flooding and sand drift.	S	DoT  SoN  DPLH
G4	Ensure coastal users are adequately informed of natural hazards and risk such as flooding and inundation through the use of signs.	O	Responsible land managers
G5	Prepare a Signage Strategy to provide a coordinated and consistent approach to providing signage throughout the coastal area and maintain signs throughout the study area, as appropriate. The Strategy should also note where signs may need to be shifted annually due to sand drift. Ensure appropriate signs are provided at coastal sites, including hazard and warning signs identifying evacuation procedures in the event of inundation or fire, interpretative and historic information, locational information, safety information, directions and identification of land use permissions and prohibitions.	O	Responsible land managers

<b>Action #</b>	<b>Description</b>	<b>Priority</b> S – Short M – Medium L – Long O – Ongoing	<b>Responsibility</b>
G6	Design of new coastal car parks, roads and buildings should minimise the visual impact on the surrounding environment and to prevent impact from sand drift (eg avoid use of straight pathways, roads; take into account prevailing wind and sand movement etc).	O	SoN
G7	Encourage access to the coast along formal tracks and pathways through the use of fencing and signage where dune degradation is an issue, and in particular at Port Gregory and Halfway Bay/Lucky Bay.	O	SoN DPLH
G8	Support efforts by the local community and NACC with weed control efforts (particularly African Boxthorn along coastal areas), dune rehabilitation and rubbish clean ups.	O	SoN, NACC
G9	Work with key stakeholders/agencies to identify degraded areas for priority rehabilitation. Involve community and NRM groups to facilitate the works.	O	SoN, DPLH, NACC
G10	Should signs of dieback be detected in the study area, establish a dieback monitoring program to monitor and manage areas susceptible to the spread of dieback for signs of infection.	S	SoN, DPLH, private landowners
G11	Follow the Management of Pytophthora Dieback Guidelines for Local Government by the Dieback Working Group (2009) in the event that dieback is detected.	O	SoN, DPLH, private landowners
G12	Seek assistance from the Department of Primary Industries and Regional Development for the eradication of feral rabbits, foxes and cats from the study area. Encourage the eradication of rabbits, foxes and feral cats by private landholders.	O	SoN, DPLH, private landowners
G13	Give due regard to SPP 2.6 which provides for public access to foreshore areas and apply when considering future options for access. Avoid straight line access and locations that may lead to dune destabilisation.	O	SoN DPLH
G14	Investigate opportunities for more formal disabled access when facilities are provided. Ensure disabled access and inclusion planning is considered when designing and implementing the actions recommended in this Strategy and that the Shire's Disability Access and Inclusion Plan is referred to.	O	SoN DPLH
G15	Work with user groups and key stakeholders to provide an integrated approach to dealing with off-road vehicle use.	O	SoN DPLH
G16	Ensure Shire-managed coastal reserves are adequately serviced with rubbish bins, amenities, seating, shelters etc. according to the level of use, resource availability and when necessary.	O	SoN
G17	Maintain the amenities located within Shire-managed coastal reserves (public amenities, picnic areas, lookouts, seating, shelters, etc.), and update facilities according to the level of use, resource availability and when necessary. Migrate as required due to beach and dune variability.	O	SoN

<b>Action #</b>	<b>Description</b>	<b>Priority</b> S – Short M – Medium L – Long O – Ongoing	<b>Responsibility</b>
G18	Form a coastal tourism partnership chaired by the Shire so that all tourism operators can be part of a Shire-wide management/education of visitors. Make resources available to the public on the appropriate use of coastal reserves, including off-road vehicle use, road registered 4WDs, and ways to reduce/avoid land use conflict. This information can be presented as a brochure, flyer or poster and can be given to key tourist sites (such as caravan parks and general stores) and to caretakers to hand out. Information on driving should include visitor safety, sustainable coastal use and off-road safety. Include information on vehicle use within coastal areas (refer to the South Coast NRM code of conduct manual and any other user group codes i.e. Trail Bike Riders) and educate vehicle drivers on the Control of Vehicles (Off-Road Areas) Act 1978 and how it is applicable to the coastal areas of the Shire.	O	SoN, DPLH
G19	Prepare a Risk Assessment including a review of access, disaster preparedness, emergency shelters and signage (indicating the emergency plan, where the next set of facilities are located and the distance to them) for coastal sites within Shire-managed reserves.	S	SoN
G20	Prepare a Monitoring Plan which should include a process for the Shire to follow in order to review actions in this CMS and whether they have been achieved. Monitoring should ideally be undertaken annually or every 6 months. In addition to visual observation of coastal features, monitoring could use technology to get an indication of how things are changing (for example, identify some points to do photo database, conduct annual drone flights etc).	O	SoN
G21	Continue to liaise with local Aboriginal representatives to ensure a culturally sensitive approach to recreational activities and the provision of visitor amenities within the study area.	O	SoN, YMAC, Native Title claim groups
G22	Encourage involvement of Aboriginal persons in coastal management through engagement, consultation and employment /volunteering where possible.	O	SoN, YMAC, Native Title claim groups
G23	Consult with relevant Native Title claim groups and the Yamatji Marpla Aboriginal Corporation to ensure appropriate recognition and protection is given to relevant heritage sites.	O	SoN, YMAC, Native Title claim groups
G24	Establish interpretative signage at culturally/historically significant sites. Consult with Native Title claim groups and the Yamatji Marpla Aboriginal Corporation in preparing informative information.		SoN, YMAC, Native Title claim groups
G25	Support programs that actively engage the local community in managing coastal reserves e.g. school education programs, beach clean-up days.	O	SoN
G26	Provide opportunities for the community to be involved in rehabilitation, monitoring, facility and access management etc	O	SoN
G27	Assist and encourage the community with forming “Friends of” groups.	S	SoN
G28	Liaise with land managers in the study area, (including DPLH and Native Claim groups and private landholders) to discuss and determine a level of commitment towards community involvement and education.	O	SoN, DPLH, Native Title claim groups, private landowners.

A photograph of a beach with waves crashing onto the shore under a clear blue sky. The water is a vibrant turquoise color, and the sand is a reddish-brown hue. The sky is a deep, clear blue with a few wispy clouds near the horizon.

# 6.0 IMPLEMENTATION

## 6.1 INTRODUCTION

This section of the Strategy provides guidance on the implementation of the CMS. The Strategy can be used as a framework to ensure coastal management is adequately catered for in future budgets. The implementation of recommendations from the Strategy will need to be appropriately costed and programmed for implementation by the responsible land managers.

## 6.2 PRIORITIES

The priorities assigned to each action are advisory only and reflect a timeframe for implementation. Priorities can be reviewed as required to take into account availability of resources and granting of funding requests.

Priorities have been classified as follows:

- S: Short term – within the next 2 financial years
- M: Medium term – within the next 5 years
- L: Long term – 5+ years
- O: Ongoing – as required.

With regards to management actions with responsibilities assigned to the Shire, it is envisaged that all management actions with those listed as Short priority will be works provided for either in the Shire annual budget or through grant funded projects within the next 2 years. Actions with Medium priority will could be implemented by Council within the next 5 years, and actions identified as Long-term priorities will could be implemented in the next 5 plus years.

Priority was determined through consideration of the comments received from the Steering Group, stakeholders and the community (which indicated issues and concerns which were high priority for them and which should be addressed in the short to medium term), the likely costs associated and the complexity of each action.

## 6.3 RESPONSIBILITIES

The responsibilities for implementation vary depending on the coastal landowner, government and community agency or user group. The responsibilities were determined largely through consideration of the tenure and land managers responsible for each site. The CMS needs to be led by the Shire, however it is recognised that the fragmented ownership can make that difficult. As such, the Shire should focus its attention on the key areas under its control in the immediate term. In addition to this the Shire can continue dialogue with private landowners, and traditional landowners and the DPLH who have some responsibility for coastal management to make sure that their effort is acknowledged and supported by the Shire. In the background, the Shire can consider whether it has the

resources and desire to seek management orders for any other key sites that are currently UCL.

## 6.4 MONITORING

Monitoring is an essential component of the management strategy. Its purpose is to assess the success of recommended actions and to determine whether they have achieved the desired outcome. It can also indicate whether the strategy requires modification to help reach the CMS objectives more efficiently. Monitoring of facilities is important to ensure they are safe and undamaged.

It is considered relevant to monitor the following within the study area:

- Visitor numbers to certain sites (e.g. Lucky Bay), especially during peak periods
- Weed invasion and the success of weed control activities
- The success of rehabilitation
- Use of 4WDs throughout the dunes, the creation of new tracks and the amount of dune degradation
- Disturbance to heritage sites
- The condition of facilities
- The condition of signs
- The cleanliness of coastal areas and whether clean-ups are required
- Rate of dune migration.

The above have been addressed in the actions contained in this report.

Action G18 recommends that the Shire prepare a Monitoring Plan which should include a process for the Shire to follow in order to review actions in this CMS and whether they have been achieved. Monitoring should ideally be undertaken annually or every 6 months. In addition to visual observation of coastal features, monitoring could use technology to get an indication of how things are changing. For example, select locations can be chosen to undertake a photo database (take photos at a certain site on a regular basis over time to get an idea of coastal changes) or an annual drone flight (to take photos of the coast from the air – this might be particularly useful for sites that are difficult to access).

Relevant actions such as weed control, revegetation, closure of tracks, replacement of signs and facilities, provision of a caretaker or ranger etc. should be undertaken if monitoring results indicate no improvement or degradation.

It is recommended that this Strategy is reviewed after a 10 year period to determine if the actions are still relevant and to take into consideration changes to the social, economic and environmental context.

## 6.5 FUNDING SOURCES

Responsible land managers may be able to seek funding for certain activities from other sources. Funding opportunities such as these tend to change on a regular basis and as a result a review of options should be undertaken each year. Projects and activities tend to be given higher priority if the proposed activities have been identified in a CMS. Applications will generally need to show how the proposed activities will have an environmental and social benefit and will need to provide details as to how the activity will be carried out, timeframes, costings and responsibilities. Funding can currently be applied for through the following:

- Coastwest Grants Program (through the DPLH)
- Coastal Management Plan Assistance Program (DPLH)
- Coastal Adaptation and Protection (CAP) Grants (Department of Transport)
- State Natural Resource Management (Department of Primary Industries and Regional Development)
- Recreational Boating Facilities Scheme (RBFS) grants (Department of Transport)
- Regional Grants Scheme (RGS) (Department of Primary Industries and Regional Development).

# PART B. CONTEXT

# 7.0 BACKGROUND DOCUMENTS

## 7.1 INTRODUCTION

This chapter includes a review of the background documents relating to the Coastal Management Strategy, including state and local government policies as well as other planning documents and background information. The purpose of the review is to establish the planning context (to communicate to the reader the guiding principles behind coastal management and the obligations of local and state government and land holders) and to provide information on the variety of reports which have been prepared for the study area which provide justification for some of the recommendations provided.

Many of the state and local government policies provided overarching guidance during preparation of the CMS. Planning documents such as the Shire of Northampton Local Planning Scheme No. 10 provide context for the future planning of the area. Other background documents such as the NACC Off-Road Feasibility Study and Control of African Boxthorn Regional Management Plan provided context and helped to guide the formulation of actions. Detailed information is extracted from these documents where relevant in Chapter 7 which provides the environmental context of the study area. They are also referred to in Chapter 10 which provides the social and cultural context.

The documents included in this review include the following:

- Australian Coastal Public Safety Guidelines
- Multiple Land Use Framework
- The Burra Charter
- Risky Business – a resource to help local governments manage environmental health risks
- Mid-West Regional Planning and Infrastructure Framework 2015
- Mid-West Tourism Development Strategy
- State Planning Policy 2 – Environmental and Natural Resources Policy
- State Planning Policy 2.6 (SPP 2.6) and Guidelines
- Coastal Hazard Risk Management and Adaptation Planning Guidelines
- State Planning Policy 3.5 – Historic Heritage Conservation
- Status of Coastal Planning in Western Australia 2012
- Coastal Planning and Management Manual 2003
- Coastal Management Specification Manual 2010
- Tourism Planning Guidelines 2014
- A Strategic Approach to Caravan and Camping

Tourism in Western Australia 2012

- Batavia Coast Strategy
- Climate Change Adaptation Action Plan
- Shire of Northampton Local Planning Scheme No. 10
- Shire of Chapman Valley Coastal Management Strategy and Action Plan 2016
- Shire of Northampton Coastal Strategy 2006
- Off-Road Vehicle Areas in the Northern Agricultural Region of Western Australia Feasibility Study
- Control of African Boxthorn Regional Management Plan
- Lucky Bay Coastal Node Study
- Geraldton Regional Flora and Vegetation Survey
- Migration of limesand dunes in Western Australia and their impacts
- Shire of Northampton Strategic Community Plan 2016-2026

## 7.2 FEDERAL

### AUSTRALIAN COASTAL PUBLIC SAFETY GUIDELINES

The Australian Coastal Public Safety Guidelines were prepared in 2007 by Surf Lifesaving Australia. The purpose of the guidelines is to provide world-best practical advice to land managers with a responsibility for public safety on the Australian coast.

These guidelines can be used by the Shire when considering coastal hazards and risks, coastal signage, beach cleaning, emergency management and coastal tourism safety.

### MULTIPLE LAND USE FRAMEWORK

Multiple landowners can exist over an area and can cause issues when it comes to access and land use across an area, especially where historic cadastre patterns have resulted in odd-shaped lots and patterns. The Multiple Land Use Framework (MLUF) was prepared by the Standing Council on Energy and Resources in 2013 in recognition of the conflict arising over land access and land use. The aim of the MLUF is to enable government, community and industry to effectively and efficiently meet land access and use challenges, expectations and opportunities. It was developed with the minerals and energy resources sectors in mind, however the underlying concepts can be applied to all sectors. The MLUF recognises that access to land is fundamentally important to the successful management of competing interests of mining, energy, agriculture, environment, community and other significant land users.

This document has a focus on outlining the guiding principles and objectives of the project, rather than specific advice as to how land use conflicts and access can be resolved. Each situation should be considered on a case-to-case basis and terms negotiated between affected parties.

### THE BURRA CHARTER

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The Burra Charter provides guidance for the conservation and management of places of cultural significance (cultural heritage places). It sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance, including owners, managers and custodians. The Charter can be applied to all types of places of cultural significance including natural, Indigenous and historic places with cultural values. It provides guidance on conservation principles, conservation process and conservation practice.

The steps in the Burra Charter process are:

- Understand the place
- Assess cultural significance
- Identify all factors and issues
- Develop policy
- Prepare a management plan
- Implement a management plan
- Monitor the results of the management plan.

### RISKY BUSINESS – A RESOURCE TO HELP LOCAL GOVERNMENTS MANAGE ENVIRONMENTAL HEALTH RISKS

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The aim of the resource is to raise awareness of how to minimise the financial, health and reputation risks related to the environmental health responsibilities of local governments and thereby protect the best interests of both their communities and their organisation. It outlines six steps to achieve effective environmental health risk management:

- Identify responsibilities
- Identify roles – how does the local government manage environmental health
- Identify what the environmental health risks are
- Identify the likelihood and likely consequences of the risks
- Identify how the local government can reduce the risks
- Identify how local government can achieve risk management outcomes.

## 7.3 STATE

### MID-WEST REGIONAL PLANNING AND INFRASTRUCTURE FRAMEWORK 2015

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The Mid-West Regional Planning and Infrastructure Framework 2015 was finalised by the WAPC in 2015. The Framework provides a regional context for land use planning in the Mid West, an overview of major regional economic, social, cultural and environmental issues, priority actions for planning and priority infrastructure projects. It categorises the region into three sub-regions: Batavia Coast, North Midlands and Murchison. The Northampton coast is located within the Batavia sub-region.

The Batavia coast includes the Regional City of Geraldton and the two Sub-Regional Centres of Dongara– Denison and Kalbarri. This sub-region will have the greatest pressure for development and will therefore require careful growth management. Port Gregory is identified as a Local Centre in the Framework.

This increased pressure for development and population growth in areas south of Northampton could have a cumulative effect on the coastal area by increasing the number of visitors to the area, especially during holiday periods.

### MID-WEST TOURISM DEVELOPMENT STRATEGY

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The Mid West Tourism Development Strategy was prepared by the Mid West Development Commission and Regional Development Australia in 2014 to inform future development and investment in the Mid West. The Strategy identified that the Mid West is underperforming as a tourist destination in that its potential is not being realised and recommends the following:

1. Increasing accommodation capacity from camping through to resorts;
2. Opening up day use sites-places previously overlooked or under-developed to enhance the Mid West's appeal as a destination;
3. Improving the quality and distribution of information for pre-trip planning and way finding;
4. Attracting more high-yield visitors and the growing self-drive and RV market;
5. Increasing the range of Aboriginal and eco nature based tourism activities, attractions and experiences.

The following recommendations are made with regards to the Shire of Northampton:

- Encourage upgrades to fishing amenities such as boat ramps, jetties, shore-side platforms, car-trailer parking bays and safety signs messages.
- Install visitor information displays (i.e. brochures and maps) at shops throughout Northampton, promoting local visitor attractions and activities.

### **STATE PLANNING POLICY 2 – ENVIRONMENTAL AND NATURAL RESOURCES POLICY**

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The Policy objectives of SPP 2 are to integrate environmental management with broader land use planning, to protect, conserve and enhance the natural environment and to promote sustainable use of natural resources. The preparation of this Coastal Management Strategy is a response to the objectives of SPP 2 and its main purpose to protect, conserve and enhance environmental features along the coast, to promote sustainable use for future generations to enjoy and to provide practical and realistic actions that can be used by decision-makers.

### **STATE PLANNING POLICY 2.6 – STATE COASTAL PLANNING POLICY**

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This Policy provides guidance for decision-making within the coastal zone including managing development and land use change, establishment of foreshore reserves; and to protect, conserve and enhance coastal values. The Policy is to inform and guide decision-making by the WAPC and its Committees, and in integrating and coordinating the activities of state agencies that influence the use and development of land in the coastal zone. It also provides guidance for private landowners wishing to undertake development in the coastal zone.

### **STATE PLANNING POLICY 2.6 STATE COASTAL PLANNING POLICY GUIDELINES**

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The Guidelines provide detailed guidance for the application of the SPP2.6 policy measures. It includes details on the following:

- Development and settlement
- Earthworks and soil
- Water resources and management
- Visual landscape
- Coastal hazard risk management and adaptation planning process
- Vulnerability assessment
- Assessing risk adaptation options

- Ongoing risk management and adaptation planning
- Communication and consultation
- Coastal adaptation and protection grants scheme
- Infill development
- Coastal protection works
- Public interest
- Public access
- Coastal roads and car parks
- Coastal pedestrian access and dual use paths
- Coastal foreshore reserves
- Ecological values
- Landscape, seascape and visual landscape
- Heritage
- Coastal strategies and management plans.

A large focus of the guidelines is planning and adapting to setbacks and ensuring infrastructure and facilities are appropriate.

### **STATE PLANNING POLICY 3.5 – HISTORIC HERITAGE CONSERVATION**

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This policy sets out the principles of sound and responsible planning for the conservation and protection of Western Australia's historic heritage. It applies principally to historic cultural heritage including heritage areas, buildings and structures, historic cemeteries and gardens, man-made landscapes and historic or archeological sites with or without built features.

The objectives of this policy are:

- To conserve places and areas of historic heritage significance
- To ensure that development does not adversely affect the significance of heritage places and areas
- To ensure that heritage significance at both the State and local levels is given due weight in planning decision-making
- To provide improved certainty to landowners and the community about the planning processes for heritage identification, conservation and protection.

The policy measures include identification and assessment of places of state significance by the Heritage Council of WA, designation of heritage areas, establishment of heritage lists, consideration of heritage when undertaking planning and establishment of development control principles.

## COASTAL HAZARD RISK MANAGEMENT AND ADAPTATION PLANNING GUIDELINES

These guidelines were prepared to support the implementation of SPP 2.6 and to assist decision-makers to:

- Consider coastal hazards and evaluate their likelihood
- Identify realistic and effective management and adaptation responses to those risks
- Prioritise the management and adaptation responses.

Risk management and adaptation planning is the practice of systematically identifying and understanding coastal hazard risks and putting in place controls to manage them in association with the affected community and stakeholders.

## STATUS OF COASTAL PLANNING IN WESTERN AUSTRALIA 2012

The Coastal Planning Program is one of the tools used to update the WAPC on land use and management of the State's coastal resources. The report identifies that the coastal considerations for the Mid West region are:

- Protection of the coast and the cost of protection works.
- Control of off-road vehicles.
- Balancing recreational demands for coastal access and Oakajee Port requirements.
- Preservation of areas with high biodiversity conflicting with land use required for residential or commercial development.
- Planning for climate change.

The report identifies a number of existing plans relating to the Shire of Northampton's coastal areas, however a majority of these have been updated since the Status of Coastal Planning was prepared. It identifies two outstanding plans which need updating (review of Horrocks Beach Coastal Plan 1993 and Little Bay site plan), however these have since been superseded by the Horrocks Coastal Management Strategy (Essential Environmental and Shire of Northampton, 2015).

## COASTAL PLANNING AND MANAGEMENT MANUAL 2003

The Coastal Planning and Management Manual was prepared by the WAPC in 2003 to provide a practical guide to coastal planning and management in WA. It provides information on a broad range of issues which should be considered when managing the coastline such as the following:

Common coastal management problems

- Techniques for dune stabilisation
- Rehabilitation of coastal landscapes
- Revegetation methods
- Weed management.

A number of principles are described in the manual, the aim of which is to advise readers about an appropriate framework for managing the coast. These principles address the following:

- Sustainable management
- Identifying the limits of acceptable change
- Maintenance of ecosystem integrity
- Consultation
- Respect for and protection of Indigenous rights, interests, culture and heritage
- Identification of management objectives
- Staged management approaches
- Minimal intervention
- Site-specific management approaches.

This manual can continue to be used by the Shire when undertaking rehabilitation, dune stabilisation and weed control.

## COASTAL MANAGEMENT SPECIFICATION MANUAL 2010

The Coastal Management Specification Manual was prepared in 2005 by Green Skills for the South Coast Management Group and revised in 2010. It provides a guide for the construction of coastal infrastructure, including specifications and drawings for the design of features such as seating and tables, BBQs, signage, car parking areas, campsites, timber boardwalks and steps, viewing platforms, birdhides, low water use toilets and fish cleaning stations.

The Specification manual should be referred to when designing and constructing infrastructure at the Shire's coastal reserves.

## TOURISM PLANNING GUIDELINES 2014

The Tourism Planning Guidelines (Tourism WA, DPLH and Western Australian Planning Commission, 2014) aim to provide assistance to local governments when preparing the tourism component of a local planning strategy. The purpose of this is to encourage an increased focus on land use planning for tourism and to provide local governments with a rationale for determining future land allocation,

planning controls and infrastructure needs for tourism.

The report provides guidance with regards to site assessments for future tourist accommodation development, infrastructure and services, tourist attractions, activities and amenities, tourism precincts and sites, zoning for tourism, tourist development in non-tourist zones, redevelopment areas, hotels, holiday homes and caravan parks.

### **A STRATEGIC APPROACH TO CARAVAN AND CAMPING TOURISM IN WESTERN AUSTRALIA 2012**

This report was prepared by Tourism WA, Brighthouse and Starfish Business Solutions in 2012 and provides recommendations to address the provision of caravan and camping infrastructure, particularly in coastal locations. The aim is to make WA the preferred caravan and camping holiday destination. No priority localities were identified within the study area.

Recommendations presented in the report include the following:

- Recommendation 1: Streamline Caravan Park and Campgrounds Regulations to Improve Supply and Meet Market Demand
- Recommendation 2: Increase Support for LandBank to Release Land for more Caravan Park Developments where Viable
- Recommendation 3: Identify Opportunities to Access Western Australia's Conservation Estate
- Recommendation 4: Create Public-Private Partnerships to Improve Delivery and Maintenance of Caravan and Camping Facilities
- Recommendation 5: Partner with Indigenous Australian's to Develop Caravan and Camping Infrastructure on Indigenous Land
- Recommendation 6: Provide Better Guidelines for the Development of Caravan Parks to Local Government
- Recommendation 7: Develop a State-wide Overflow Policy That Works for Visitors and Supports Industry
- Recommendation 8: Raise the Bar on Skills for the Caravan and Camping Sector
- Recommendation 9: Improve Data to Support Decision Making
- Recommendation 10: Develop a Marketing Strategy to Improve Perceptions and Online Presence of the Caravan and Camping Sector
- Recommendation 11: Secure Sustainable Regional Tourism Benefits from the Resource Mining

Boom.

No specific mention is made relating to the study area, although it does refer to Northampton and Kalbarri.

### **ABORIGINAL HERITAGE DUE DILIGENCE GUIDELINES**

The purpose of the Guidelines is to assist land users to be more aware of how their activities could adversely impact an Aboriginal site. Compliance with the Guidelines will not of itself guarantee compliance with the Aboriginal Heritage Act, however, where the Guidelines are followed, it is less likely that Aboriginal sites will be harmed. The Aboriginal Heritage Directorate recommends that developers undertaking activities within the study area take into consideration the Guidelines when planning. The guidelines have been developed to assist proponents to identify any risks to Aboriginal heritage and to mitigate risks where heritage sites may be present. Due diligence may involve one or more of the following actions:

- assessing the landscape where an activity is to take place
- assessing the proposed activity and the potential impact on the landscape
- searching the Register of Aboriginal Sites and the Aboriginal Heritage Inquiry System
- consulting with the relevant Aboriginal people
- agreeing to an Aboriginal heritage survey
- other heritage management strategies.

## **7.4 LOCAL**

### **BATAVIA COAST STRATEGY**

The Batavia Coast Strategy was prepared in 2001 by the Batavia Coast Coastal Planning Group and Landvision. The Batavia Coast Strategy provides regional and local directions for future coastal planning and management along the Batavia Coast. The study area extends from the northern boundary of the Shire of Northampton to Dongara in the south. It includes the coastal towns of Geraldton, Dongara, Cape Burney, Horrocks, Port Gregory and Kalbarri.

The Strategy states that tourism development in the region, including permanent developments, tour operations, and events of a temporary nature (such as surfing and windsurfing competitions), may be both appropriate and desirable at certain locations along the Batavia Coast. It recommends the encouragement of greater tourism and recreation opportunities at Kalbarri, Port Denison and Dongara.

The Batavia Coast Strategy recognises the need to maintain off-road vehicle access to recreational sites and opportunities but advocates a more controlled approach in co-operation between ORV users and land managers. It also recognises the possibility of additional camping areas being identified in the future as pressures grow.

### CLIMATE CHANGE ADAPTATION ACTION PLAN

The Climate Change Adaptation Action Plan was prepared by AECOM Australia Pty Ltd and the Batavia Regional Organisation of Councils in 2010 to undertake a climate change risk assessment and to develop an action plan for the councils in response to higher temperatures, reduced rainfall and sea level rise. The study identified a number of high climate change risks including the following relating to coastal areas:

- Increased maintenance, relocation or litigation costs due to inadequate protection from sea level inundation.
- Loss of the region’s natural heritage through damage to coastal and other habitats.
- Damage (e.g. erosion, vegetation removal) to natural coastal assets and habitats (e.g. dune and estuarine systems), resulting in increased revegetation/remediation/maintenance costs to councils.
- Building repair and insurance related costs to councils due to sea level related flooding damaging council buildings.
- Increased cost to councils due to requirement to relocate coastal community facilities (such as playgrounds and events area) to avoid sea level rise inundation.
- Increased beach, marina and boat ramp maintenance/repair requirements due to sea level rise and storm surge impacts leading to higher costs to councils.
- Increased foreshore reserve widths due to sea level rise resulting in higher reserve maintenance costs to councils.
- Conflict between councils and developers due to a requirement for larger coastal setbacks to protect against long term sea level rise.

High priority actions relating to coastal areas include the following:

- The protection of local properties from sea level rise and bushfire risks.
- The protection of at risk coastal and other habitats.

With regards to the above risks and high priority actions,

it is considered that a majority apply to coastal area with hard infrastructure and more formal facilities such as boat ramps, jetties, groynes, limestone walls and buildings. The only hard structures in the study area are at Port Gregory.

### SHIRE OF NORTHAMPTON LOCAL PLANNING SCHEME NO. 10

The Shire of Northampton Local Planning Scheme No. 10 was gazetted in January 2012 and identifies the zones and reserves for land throughout the Shire of Northampton.

The zones and reserves throughout the study area as shown in the Scheme are listed in the table below.

**Table 7.1 – Local Planning Scheme Zones and Reserves**

Area	Zone/Reserve
Wagoe to Lucky Bay	Reserved as Parks and Recreation
Halfway Bay	Reserved as Parks and Recreation
Halfway Bay to Port Gregory	Zoned General Rural
Port Gregory foreshore	Jetty and car parking areas are Reserved for Public Purposes – HIP (Historical Purposes). The public toilets are Reserved for Public Purposes – PT (Public Toilet). The coastal area north and south is zoned General Rural.
Hutt River	Zoned General Rural
Hutt River to Little Bay	Zoned General Rural
Bowes River Mouth to the Shire boundary	Zoned General Rural with a narrow strip Reserved as Parks and Recreation along the coast.

The entire study area is also included within Special Control Area SCA 1 – Coastal Planning and Management. The purpose and intent of this area is to:

1. To protect and enhance the environmental, cultural, recreational and/or scenic values of the area; and
2. Give priority to coastal dependent land uses and development that by their very nature require coastal sites.

The Scheme provides a list of considerations for any planning and development applications within this area.

### SHIRE OF CHAPMAN VALLEY COASTAL MANAGEMENT STRATEGY AND ACTION PLAN

The Shire of Chapman Valley Coastal Management Strategy and Action Plan was finalised in early 2016. It included

recommendations for Oakabella Creek and Woolawar Gully. The recommendations were largely based on the recommendations in the previous Strategy and based on consultation with the Shire of Northampton who confirmed their desire to keep these sites as low-key recreation areas. The recommended actions in this CMS are largely based on the recommendations in the Chapman Valley report.

## SHIRE OF NORTHAMPTON COASTAL STRATEGY 2006

The Shire of Northampton Coastal Strategy was prepared by the Shire of Northampton and Landvision in 2006. The Coastal Strategy applies to the Shire of Northampton coastline south of the Kalbarri National Park. An assessment of the recommendations from the 2006 was undertaken in order to determine which actions have been undertaken and which are still relevant. The outcomes of the assessment are in the table below.

**Table 7.2 – Recommendations from the Shire of Northampton Coastal Strategy 2006**

Site	Recommendation from 2006 CMS	Comment
Port Gregory	New development areas to be investigated set back from coast with some oriented towards Hutt Lagoon.	It is not recommended that the townsite is expanded and new development areas created.
	New beach access points to be investigated north-west and south-east of Port.	Beach access points already exist north and south of Port Gregory, accessible via 4WD only.
	Gregory to relieve congestion at the town jetty and conflict of beach access.	Congestion at the jetty is not an issue at present.
	New boat launching ramp at north-west beach access points.	Any fixed infrastructure is vulnerable to erosion from storms during periods of retreat and accretion during periods of erosion.
	Creation of passive beach areas south of jetty backed by foreshore amenity area to provide for more public amenity and reduction of conflict of beach use.	A shade shelter is located south of the jetty, and a BBQ and picnic benches are located near the car park.
	Widen existing boat ramp.	Any fixed infrastructure is vulnerable to erosion from storms during periods of retreat and accretion during periods of erosion.
	Designate off-road vehicle area on dunes north of town in consultation with user groups and CALM.	Land surrounding the town is UCL. A Permitted Off-Road Vehicle Area under the Control of Vehicles (Off-Road Areas) Act 1978 will need to be formalised and a manager established for the area. It will require comprehensive consultation with community, traditional owners and government agencies. If the Shire decided to manage the area it would involve a significant amount of responsibility. This is not recommended.

Site	Recommendation from 2006 CMS	Comment
Hutt River	Formalise access and parking and rehabilitate tracks, close non-essential tracks.	Access points seem well-established and no evidence of new tracks is evident. It is not recommended that access and parking is formalised as the site is UCL and privately owned. Retain as a low-key day use site.
	Incorporate in reserve which stretches from the coast to the Port Gregory Road and includes aboriginal sites.	Reserve 48584 stretches along the river foreshore and includes the northern access point and car park. The remainder of the site is UCL and private ownership. If the reserve was extended to the coast it would mean the land would need to be purchased. This is not recommended.
	No facilities in the short-term except bird hide.	No facilities to be installed. A bird hide was not installed, however this site is on private property and UCL and the installation of a bird hide would require consultation and agreement with landowners.
	Dependent on conservation values possibly vest in CALM, otherwise create a recreation reserve vested in the Shire.	As stated above, the site is UCL and private ownership. If the reserve was extended to the coast it would mean the land would need to be purchased. This is not recommended.
Halfway Bay	Formalise shack development.	This has been undertaken with the implementation of the lease agreements between the shack owners and the Shire.
	Make provision for camping and caravans within existing reserve.	A camping and caravan park is not recommended within Reserve 34945. A camping node has been identified by the Shire north of the shacks through the coastal camping nodes project undertaken by the Shire.
	Upgrade access road to two-wheel drive standard.	This has been undertaken (access to Halfway Bay only).
	Extend reserve to high water mark to include areas subject to coastal rehabilitation measures.	Extension of the reserve will require negotiation with native title holders. The Shire has requested the management order of a portion of Reserve 35206 to enable them to manage the camping nodes at Luck Bay. The Shire has also applied to extend R34945 to just north of the existing shacks.
	Investigate provision of low-key services.	Some services have been provided (rubbish bins at Halfway Bay, toilets at the camp site, caretaker facilities). It is considered that these facilities are appropriate for the site.
	Limits on minimum and maximum building standards and length of occupancy.	This has been addressed in the lease agreement.
	Include designated overflow areas in transit reserve.	This has been done through the coastal camping nodes study.
	Shire to consider sub-leasing reserve to private manager.	A private manager hasn't been established, but lease agreements have now been formalised.

Site	Recommendation from 2006 CMS	Comment
Lucky Bay	Incorporate overflow areas north of Halfway Bay in Transit Stay Park to allow for camping in peak periods only.	This has been achieved through the coastal camping nodes study and a new camping node established south of Lucky Bay. Overflow camping will be permitted during peak periods but only if campers have a chemical toilet.
	Designate off-road vehicle area on dunes to the north in consultation with user groups.	Reserve 35206 does not have any management orders assigned and surrounding area is UCL. A Permitted Off-Road Vehicle Area under the Control of Vehicles (Off-Road Areas) Act 1978 will need to be formalised and a manager established for the area. It will require comprehensive consultation with community, traditional owners and government agencies. If the Shire decided to manage the area it would involve a significant amount of responsibility. This is not recommended.
	Access track not to be upgraded past Halfway Bay.	This has been done.
	No facilities in the short-term.	Facilities have been established at the camping area (toilets and dump point).
Coastal Environment (private land)	No action necessary unless and until adjoining owners develop adjoining areas or open up sites for public access through their properties.	This action is still relevant. The Shire should continue working with and liaising with private landowners.
Woolawar Gully, Jacksons Hole and Oakabella Creek Recreation Sites	In the interim coastal environment to be included in Special Control Area.	This has been achieved.
Coastal Environment (public land)	Carry out rehabilitation measures as identified in this report including ongoing maintenance.	This action is still relevant.

The Development Concept Plan prepared for Halfway Bay in the 2006 Strategy proposed a number of new elements. The relevance of these elements is discussed in the table below.

**Table 7.3 – Development Concept Plan for Halfway Bay from 2006 Coastal Management Strategy**

Proposed Element from 2006 Strategy	Comment
The main tracks are identified and set aside for access.	Tracks are well-established throughout the area.
A through route to Lucky Bay is defined.	A track to Lucky Bay is well-established.
Random tracks are to be closed and revegetated	Random, duplicate and new tracks should continue to be closed and revegetated.
Permits/leases are to be sought from shack occupiers and shacks upgraded to meet provisions of Council local laws.	Formal leases have been established between shack owners and the Shire.
Areas not identified as shack sites or access tracks are to be revegetated and managed.	The Halfway and Lucky Bay area will require ongoing management.

Proposed Element from 2006 Strategy	Comment
Limited facilities (ablution blocks, grassed areas, firewood and outdoor barbeques) are to be provided as demand warrants.	The ablution blocks, grassed areas and barbeques identified in the Development Concept Plan in the 2006 Strategy are not proposed. Toilets and a waste dump point have been constructed in the new Lucky Bay camping node. Other facilities are not proposed in the short-medium term. The site currently does not have a water supply. The 2006 Strategy suggested that preferred water supply option is a deep bore supplemented by rainwater tanks. However it is proposed that for the short-medium term that the site is kept low-key without the provision of power and water supplies.
Provision is made for campsites in the eastern part of the Halfway Bay reserve, separated from the shacks.	Provision for a new campsite to the east of the shacks is not proposed as a camping area has already been established as identified in the Shire's coastal camping nodes study.
Caravan park bays are identified in the southern and eastern portion of the reserve.	Provision for additional caravan parking areas is not proposed.
Overflow areas for campsites are proposed outside the reserve.	The area outside the reserve has now been established as the Lucky Bay coastal camping node, as identified in the Shire's coastal nodes camping study.
Provisions for manager/ranger/caretaker office at an appropriate point on the entry road.	Caretaker has been instated.
Provision for lookouts and fenced access to the beach.	Existing access tracks seem to be well used and there is not much evidence of new tracks being created. Lookouts are not proposed.
Provision for four-wheel drive beach access.	Existing tracks are well-established for 4WD use.
Provision for a carpark for day visitors.	No car park is proposed as day visitors are able to park within existing areas or on the beach.
Sandalwood Bay and Lucky Bay to remain unchanged.	Apart from the new camping node at Lucky Bay, these areas should remain unchanged.

## OFF-ROAD VEHICLE AREAS IN THE NORTHERN AGRICULTURAL REGION OF WESTERN AUSTRALIA FEASIBILITY STUDY

The Off-Road Vehicle Areas Study was undertaken by Pretzel S. and NACC in 2015 as a response to community and environmental concerns about unmanaged ORV use within the coastal zone of the Northern Agricultural Region (NAR). The study investigates the feasibility of establishing one or more areas of land within the NAR as an ORV 'Permitted Area' under the Control of Vehicles (Off-Road Areas) Act 1978.

Currently there are five gazetted areas under the Control of Vehicles (Off-road Areas) Act. These areas are located in Lancelin, Ledge Point, Cervantes, Jurien and Southgates. The study investigated the possibility of creating Permitted Areas at Southgates and Buller River Mouth. No Permitted ORV Areas were identified within the Shire of Northampton.

## CONTROL OF AFRICAN BOXTHORN REGIONAL MANAGEMENT PLAN

The Regional Management Plan to Control African Boxthorn (NACC, n.d.) was commissioned by NACC with the purpose of guiding and prioritising on-ground works to control African boxthorn (*Lycium ferocissimum*) within four local government areas in the Northern Agricultural Region (the Shires of Irwin, Chapman Valley and Northampton and the City of Greater Geraldton). The document aims to collate and present as much information as possible on the effective management of African Boxthorn, and to prioritise sites for future control works based on the current known distribution data, locations of current investment in control and proximity to conservation assets.

Current known populations have been mapped in the Shire of Northampton which shows the weed has spread along the southern coastal extent of the Shire, extending to White Cliffs. The report also identifies that control of African Boxthorn has occurred from Woolawar Gully to the southern boundary of the Shire. The priority of African Boxthorn control along the coastal area of the Shire ranges from Low to Medium, with one area of High priority at Bowes River Mouth. Priority areas in the Shire are Hutt River Lagoon, Oakabella and Horrocks / Bowes River.

## LUCKY BAY COASTAL NODE STUDY

The Shire of Northampton conducted the Lucky Bay Coastal Node Study in 2016 in response to community and Council concerns regarding camping, littering and the degradation of dune structures and vegetation between Halfway Bay and Lucky Bay and the results of the community consultation from the 2006 Coastal Strategy where a survey of shack owners and other Lucky Bay visitors identified a need for designated camping sites and the provision of camping amenities to protect the coastal precinct.

The study resulted in plans to develop a formal camping node at Lucky Bay with multiple camp sites (approximately 78) with ablutions (four 3 bay toilets), shade structures (four), one chemical dump point and seating also provided. A new road to the camping nodes and to Lucky Bay itself has been constructed to create a bypass around the Halfway Bay shacks in order to improve safety for families staying there. Camping nodes are defined by a lime/garnet sand road network. The original plan was to install fencing to prevent bush degradation but the Shire has since revised this plan, as they feel the money would be better spent on additional shade structures and seating.

A caretaker resides at the entry point of the new Lucky Bay track, and fees will be collected to manage the camping beyond that point. Camping other than at the coastal nodes

will be allowed for visitors who are fully self-contained (i.e. have their own chemical toilet) and free access will be given to Halfway Bay Shack owners and visitors, as well as day visitors who don't intend to camp overnight.

Signage is used to direct people to nodes, provide information/rules and cross promote other nodes in other Shires that are also a part of this project.

Pedestrian access to the beach will also be constructed.

The caretaker duties are listed below:

### 1 Ranger/Caretaker

- 1.1 Perform duties including the collection and recording of camping fees and issue of receipts on a daily basis
- 1.2 Provide general/tourist information and advice on a daily basis.
- 1.3 Service and clean toilets on a regular basis, at least twice daily, by sweeping and pressure cleaning with clean water.
- 1.4 Perform general tidying tasks throughout the reserve as required.
- 1.5 Report matters to the Shire, as necessary.
- 1.6 Deliver camping fees to the Shire office in Northampton at least once a week.
- 1.7 Arrange for the emptying of toilet septic and the Dump Point holding tank by contacting Northampton Shire Office who will arrange for these works to take place on an as required basis.
- 1.8 Maintain caretaker's accommodation unit, office and storage shed and keep tidy at all times
- 1.9 Maintain and keep in good working order the diesel generator and report any faults to the Northampton Shire office.
- 1.10 Keep refuse bins area in a clean and tidy state.

### 2 Dog Control

- 2.1 Perform patrols of the Lucky Bay/Halfway Bay areas and where appropriate report infringements of the Dog Act 1976 to the Northampton Ranger.
- 2.2 Report significant infringements of the Dog Act to the Northampton or Kalbarri Ranger for further investigation if required.

### 3 Miscellaneous Local-Laws and Acts

3.1 Report significant infringements of the Litter Act to the Northampton Ranger.

### 4 General Duties

4.1 Any other duties as directed by the CEO or his representative.

## GERALDTON REGIONAL FLORA AND VEGETATION SURVEY

The Geraldton Regional Flora and Vegetation Survey (GRFVS) was prepared in 2010 by the then Department of Planning (now DPLH) and Ecoscape and aims to provide a regional context for land use planning and the environmental impact assessment of proposals affecting native vegetation in the Geraldton region. This report provides information on vegetation types in the GRFVS area, mapped and described at the regional scale as Beard vegetation associations, and at the local scale as GRFVS plant communities. The study area extends from Coronation Beach Road (Shire of Chapman Valley) to Devlin Pool Road (south of Greenough River), and east to the foothills of the Moresby Range. While the study area does not extend to the Shire of Northampton, it can nevertheless provide some context on the vegetation and flora within the Shire. Further information from the GRFVS is contained in Chapter 9 – Environmental Characteristics.

## MIGRATION OF LIMESAND DUNES IN WESTERN AUSTRALIA AND THEIR IMPACTS

This report is a documentation of the rates and directions of migration of limesand dunes along the Mid West coast between Lancelin and Geraldton. Even though the study area for this report is south of Northampton, the findings of the study could assist in coastal management.

The study used ArcGIS, georeferenced maps and aerial images from 1960 to 2010 to measure and monitor the locations of a selection of mobile dunes. Over the period of the study those measured travelled at rates that averaged between 4.1 and 15.8 metres a year for the 50 years, generally moving in a northerly direction, covering between 20,000 and 14 hectares and the longest migration distance identified is 21 kilometres. The monitoring of migration rates can provide valuable information for resource management and geohazard risk reduction as the rates and directions measured can provide predictive tools to document future impacts on built infrastructure.

## SHIRE OF NORTHAMPTON COMMUNITY STRATEGIC PLAN 2016-2026

The Shire of Northampton Community Strategic Plan was prepared in 2016. The vision for the Shire is A proud and unique community recognising the past and creating the future. **The Shire's mission is to provide community leadership by modelling and supporting economic, environmental and social development within the Shire.** One of the strategies in the Plan is **Better protection of coastal precincts/areas.** The following actions are provided in the Plan:

2.2.1 Protect coastal land and manage access to coastal areas by designating entry and exit points to coastal areas and river banks and develop roadside reserves in coastal areas

2.2.2 Section off coastal areas as "no go" zones

2.2.3 Litter management in coastal areas

2.2.4 Work with key agencies such as DPaW and NACC to secure funding for coastal protection and management projects

2.2.5 Lobby DoP (now DPLH) to provide the resources required to protect coastal strip of the Shire

2.2.6 Manage camping areas within the Shire.

The Measure of Success include:

- Number of designated coastal areas
- Support community groups in controlling entry and exit points to coastal areas
- Signage and fencing around designated coastal reserves
- Develop litter management policy for coastal areas
- Promote litter management policy
- Community policing of litter management policy
- Ability to resolve native title issues surrounding coastal areas
- Work with Government agencies to achieve strategy
- Identify and access resources to manage coastal areas
- Development of camping sites at Halfway Bay and Lucky Bay.

The above actions are reflected in the results of community consultation undertaken for this project. The actions in this Strategy will focus on these issues.

# 8.0 CONSULTATION

## 8.1 INTRODUCTION

A comprehensive consultation process was followed during the preparation of this Strategy. It included the following:

- Notice in the local newspaper
- Meetings with the Steering Group
- Liaison with landowners and Halfway Bay shack owners
- Community meetings held at Port Gregory and Horrocks
- Community survey (available online and hardcopy)
- Social media (Facebook group)
- Liaison with technical stakeholders/government agencies and service providers
- Liaison with stakeholders (commercial operators, store owners, accommodation owners, community groups etc)
- Liaison with traditional owners (Hutt River Working Group and YMAC).

The consultation program aimed to provide a number of opportunities for involvement, and provided a number of ways in which community and stakeholders could provide comment and feedback. One of the main outcomes of this process is to gather as many ideas and feedback as possible. The outcomes of the consultation program is outlined below.

## 8.2 PAST CONSULTATION

Consultation undertaken during the preparation of the 2006 Coastal Strategy included meetings with a Steering Committee, consultation with interested residents at Horrocks and Port Gregory and public advertisement of the draft Strategy in 2006.

## 8.3 STEERING GROUP CONSULTATION

A Steering Group was formed to guide the project and to review the draft Strategy. The first meeting was held with the Steering Group on the 11th November 2016. The purpose of the meeting was to introduce the Group to the project, to discuss the project methodology and timeframe in more detail and to discuss issues needing consideration.

A second meeting was held on the 15th May 2017, the purpose of which was to discuss the draft strategy and its recommendations.

Members of the Steering Group include:

- Craig Simkin – Shire President

- Sandy Stock-Standen – Shire Councillor
- Hayley Williams – Principal Planner
- Deb Carson – Planning Officer
- Phil Cooper – Chairperson – Halfway Bay Cottage Owners committee
- John Miles – Port Gregory Progress Association President
- John Cooley - Halfway Bay Cottage Owner
- Michael Taylforth – Land Insights
- Sharee Rasmussen – Land Insights.

## 8.4 LANDOWNER CONSULTATION

A letter was sent to all coastal landowners and shack owners in October 2016. The purpose of the letter was to inform landowners of the project and how they can get involved or provide comment, a link to the Facebook page and online survey and to offer the opportunity for further discussions either via email, phone or at the community meetings. The landowners attended the community meetings, completed the survey and discussed the project over the phone.

A letter was also sent to the Halfway Bay shack owners in October 2016. As many do not reside in the local area this made face-to-face discussion and attendance at the community meetings more difficult, however they were provided with other ways to provide feedback such as through the Facebook group, the community survey and by getting in touch via email or phone.

A second letter was sent to all landowners in June 2017 to advise that the draft was available for review.

## 8.5 COMMUNITY SURVEY

A community survey was distributed in hardcopy form and online. It was made available from the 20th October 2016 to 5th December 2016 (6 weeks). The survey was published online and was also available in hardcopy form. Hard copies were available at the following locations:

- Northampton and Kalbarri Shire offices
- Port Gregory Caravan Park
- Port Gregory General Store
- Horrocks Caravan Park
- Horrocks General Store
- Horrocks Beachside Cottages.

A total of 90 responses were received.

The results of the survey are summarised below.

**Table 8.1 – Community Survey Results**

Question	Response
Where are you from?	Majority local (74%) followed by WA (24%).
How often do you visit?	Majority yearly (27%), followed by daily (24%).
How long do you generally stay for?	Majority response was day trip (29%), followed by a few days (20%) and longer than a month (18%).
Have you visited any other beaches in the area? If so, which ones?	<p>Most popular responses were:</p> <ul style="list-style-type: none"> <li>• Lucky Bay</li> <li>• Horrocks (not included in study area)</li> <li>• Halfway Bay</li> <li>• Port Gregory</li> <li>• Bowes River (Not included in study area)</li> <li>• Little Bay (not included in study area)</li> </ul> <p>The sites with the least number of visits are:</p> <ul style="list-style-type: none"> <li>• Woolawar Gully</li> <li>• Broken Anchor Bay</li> <li>• Whaleboat Cove (not included in study area)</li> <li>• Oakabella Creek.</li> </ul>
What are your main activities when you visit the beach?	<p>Most popular activities are:</p> <ul style="list-style-type: none"> <li>• Fishing</li> <li>• Swimming</li> <li>• Relaxing</li> <li>• Walking</li> <li>• Water-based activities such as windsurfing, kitesurfing and surfing were least popular.</li> <li>• Off-road driving, quad biking, photography and scuba-diving were also noted.</li> </ul>

What do you value most about the beach?	<p>Most common is:</p> <ul style="list-style-type: none"> <li>• Sandy beaches</li> <li>• Undeveloped nature</li> <li>• Environment.</li> </ul>
What are the biggest issues?	<p>The biggest issue was rubbish. Other issues were also identified such as:</p> <ul style="list-style-type: none"> <li>• Environmental damage</li> <li>• Off-road vehicles</li> <li>• Anti-social behaviour.</li> </ul>

The survey also asked respondents for specific suggestions regarding improvements and ideas for change and coastal management. The most popular responses were:

- Management of rubbish (by providing more bins, encouraging people to take rubbish home, signage, issuing of fines and ranger presence to control this issue)
- The need for more ranger presence to help control issues relating to anti-social behaviour, rubbish, toilet waste, damage to vegetation, ORV activity etc
- More signage needed to provide information to coastal users (such as letting down tyres, controlling access, encouraging people to take home rubbish etc)
- Keep coastal areas as they are (i.e. do not commercialise, do not improve access to encourage more campers, do not provide too many facilities or too many controls etc.)

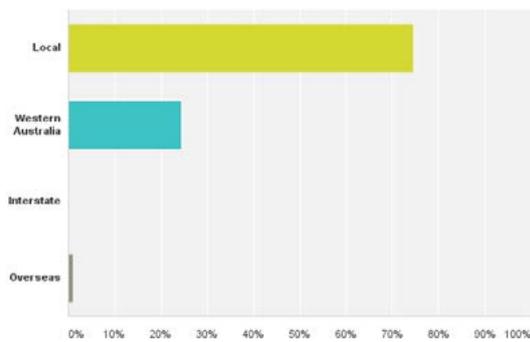
Some other responses included the following:

- Ban jet skis in the bay
- Leave Halfway Bay as it is
- Make sure campers at Lucky Bay have their own toilets
- Agree with improvements at Lucky Bay and the need to charge campers
- More rehabilitation for erosion control
- Restrict ORV in the dunes and rationalise tracks
- Do not restrict vehicle access to beaches
- Engage traditional owners to prepare a plan
- Better facilities at beaches (including boat launch facilities)
- Keep the coast natural
- The Shire is doing a good job managing the coastal environment.

As can be seen from the above results, the biggest issues identified in the community survey relate to rubbish, environmental damage, uncontrolled vehicle access and the need for more signage and ranger presence. The community value the undeveloped nature of the coast, its peacefulness, seclusion and wilderness qualities and

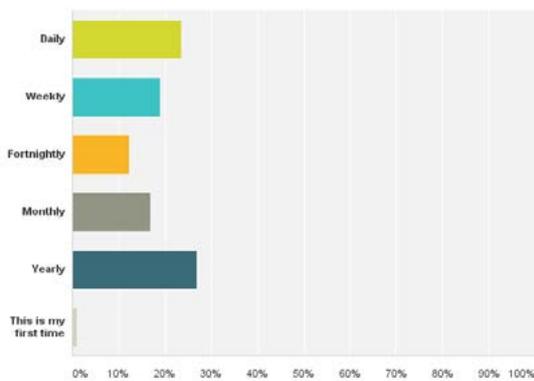
**Q1 Where are you from?**

Answered: 99 Skipped: 0



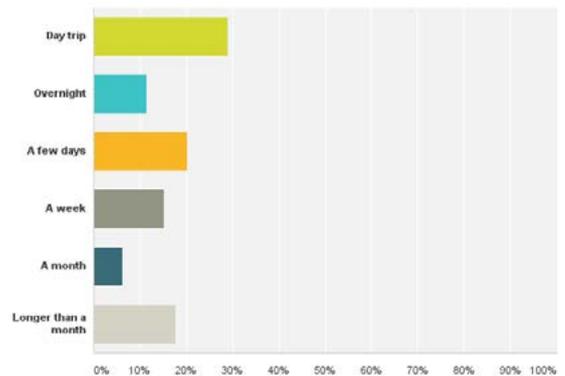
**Q2 How often do you visit beaches within the Shire of Northampton?**

Answered: 89 Skipped: 1



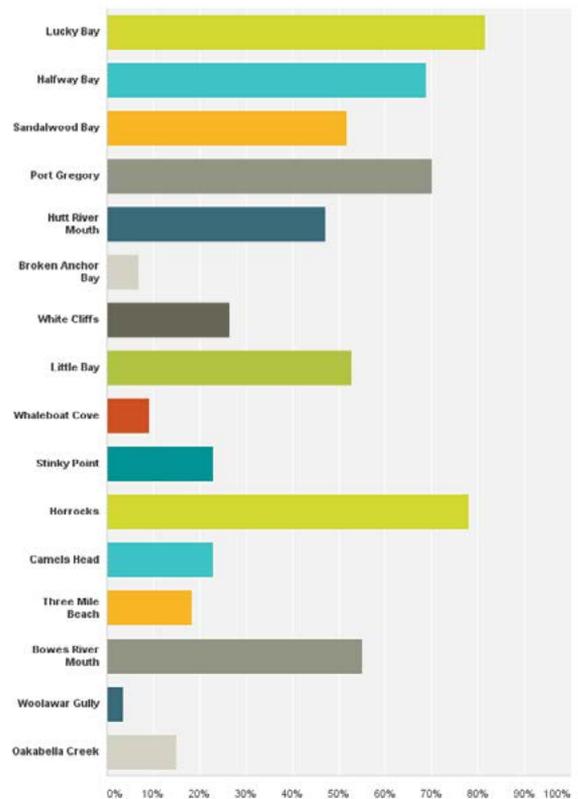
**Q3 How long do you generally stay (or how long do you plan on staying if this is your first time)?**

Answered: 79 Skipped: 11



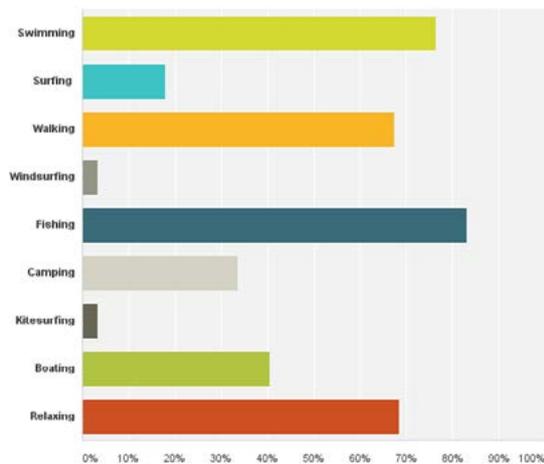
**Q4 Which beaches have you visited in the area?**

Answered: 87 Skipped: 3



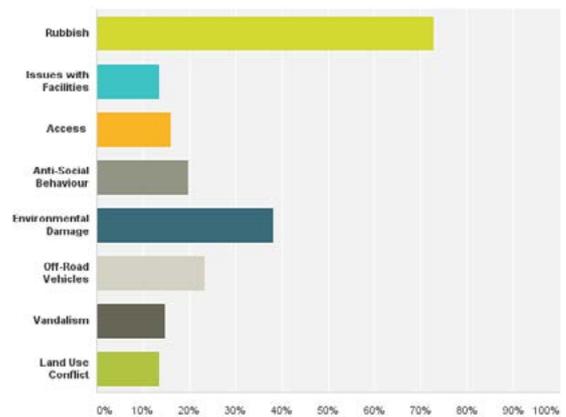
**Q5 What are your main activities when you visit the beach?**

Answered: 23 Skipped: 1



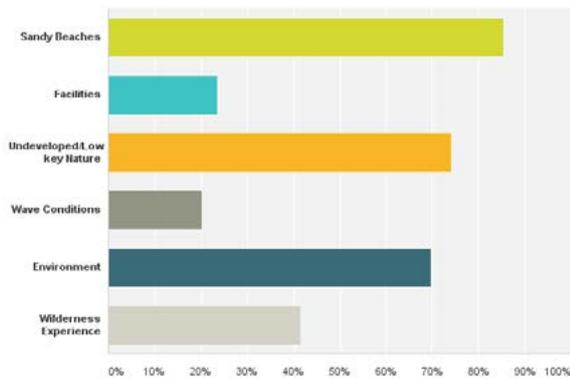
**Q7 What are the biggest issues along the coast?**

Answered: 21 Skipped: 9



**Q6 What do you value most about the coast?**

Answered: 23 Skipped: 1



the recreational opportunities afforded. It is therefore important that the Strategy doesn't propose too much development or change, but rather ways to help manage the existing environment and facilities so future generations can also enjoy these sites. This is reflected in the actions in the Coastal Management Strategy.

**8.6 COMMUNITY MEETINGS**

Two community meetings were held early in the project. The aim of the meetings were to provide an opportunity for the community to discuss the project with the consultant team and the Shire. A meeting was held at the Horrocks Community Centre on the 9th November 2016 and a meeting was held at the Port Gregory Hall on the 10th November 2016. Although Horrocks is not included in the study area, it is the only coastal settlement within the southern half of the Shire and provided an opportunity for those living in the local area to attend a meeting.

The Horrocks meeting had 7 attendees and the Port Gregory had 13 attendees. The comments from these meetings are listed below:

**LUCKY BAY**

- Concerns about how the site will be managed by the new caretaker, especially during peak periods, and especially considering a number of access tracks that lead from the road into the site (i.e. there are many ways to get to the site)
- Visitors also camp elsewhere in the dunes
- Aboriginal Heritage Study of Lucky Bay- considered

to not be comprehensive enough as it did not involve a physical Aboriginal heritage survey.

### HALFWAY BAY

- Ensure that lessees keep their areas tidy and clean

### PORT GREGORY

- Siltation and sand accumulation is the largest issue
- Siltation around the jetty has rendered it useless for boats
- Sand accumulation has occurred along the vehicle access, threatened the car park and has buried the pedestrian steps
- The BBQ area is not protected from wind – needs some wind protection
- BBQ area needs to be cleaned
- Fish cleaning area may be required
- Oil receptacle at Port Gregory- conflicting feedback on whether this receptacle is still used/needed. Is this still being managed and emptied or is it a risk of contamination

### HUTT RIVER

- Landowners allow people to access the site, but no overnight camping
- Issues are primarily rubbish and human waste (which is why camping is discouraged)
- Aboriginal heritage site
- Vehicle tracks throughout the area
- Shire should support the landowners to help keep the site clean and to prevent camping

### BOWES RIVER MOUTH SOUTH

- Suggested a bird hide is established at Bowes River
- Area south of Bowes River – users getting bogged regularly – need for education (information) measures such as signs.

## 8.7 GOVERNMENT AND STAKEHOLDER CONSULTATION

A letter was sent to stakeholders in November 2016. The purpose of the letter was to inform stakeholders of the project, how they can get involved or provide comment, a link to the Facebook page and online survey and to offer the opportunity for further discussions either via email, phone or at the community meetings.

- Local crayfishermen

- Port Gregory Progress Association
- Port Gregory Caravan Park
- Port Gregory General Store
- Wagoie Quad Bikes and Chalets
- Northern Agricultural Catchments Council (NACC)
- Geraldton 4 Wheel Drive Club Inc.
- Geraldton Longboard Club
- Geraldton Windsurfing Club
- Geraldton Angling Club
- Geraldton Motocross Club
- Mid West Enduro & Trail Riders Club
- Yamatji Marpla Aboriginal Corporation

Some of the above stakeholder were able to attend the community meetings to give feedback. A discussion was held on the phone with the owner of Wagoie Quad Bikes and Chalets. Liaison with YMAC and the lawyer for the Hutt River Working Group was also maintained throughout the project.

The following comment was received from the NACC:

**Regarding the stretches of coastline included in the current study, NACC is currently involved in the following activities:**

- **African Boxthorn mapping and removal from coastal dunes from White Cliffs south to the Shire boundary (White Cliffs is the northernmost boundary of the regional boxthorn infestation that covers the shires of Irwin, Chapman Valley, Northampton and the City of Greater Geraldton. It is crucial that this WONS is not permitted to spread northwards to infest riparian vegetation around Hutt Lagoon and the Murchison River)**
- **ORV use and coastal camping, NACC has engaged the Shire of Northampton in an attempt to establish a gazetted ORV use area which would have the benefit of providing a legal facility for ORV users and take some pressure off the coast. The Shire were not keen, preferring to manage the issue by increasing compliance via on-ground rangers. NACC was not asked for input on the coastal camping nodes at Lucky Bay but fully supports the concept of containing coastal camping into manageable nodes.**
- **The Hutt Lagoon is an important feeding ground for migratory shorebirds and NACC support**

**community monitoring that contributes to national BiDPLHife Australia surveys.**

**In addition to the above, NACC actively encourages and supports LGA's to undertake coastal adaption planning, although as far as I am aware Northampton has not started this process. CHRMAP would apply to the town sites of Kalbarri and Horrocks rather than the undeveloped coast in the current study. The need to undertake CHRMAP should be acknowledged in all coastal plans and strategies from now on.**

A letter was sent to technical stakeholders/government and service providers in November 2016 to inform them of the project and to invite further comment. A summary of the government stakeholders and their responses is provided in the table below.

**Table 8.2 – Government Consultation Summary**

Agency	Comment
Alinta Energy	ATCO Gas Australia does not have or operate any gas assets or gas infrastructure within the Shire of Northampton.
DPLH (previously Department of Aboriginal Affairs)	The Department of Aboriginal Affairs is reviewing files held for sites registered under the Aboriginal Heritage Act, 1972, in the relevant area. No further comment received to date.
Department of Primary Industries and Regional Development (previously Department of Agriculture & Food)	No comments at this point, however advise to consider tsunami risk along the coast.
Department of Water and Environmental Regulation	No response.
Department of Fire & Emergency Services	No comment to provide at this point.
Department of Fisheries	No response.

Agency	Comment
Department of Health	DoH has interest in regard to recovery from disasters and management of public health systems. A document 'Land Use Planning for Natural Hazards' can assist and guide the use of land to effectively reduce risk and enhance sustainability for areas prone to flooding (including storm surge) land subsidence, strong wind and coastal erosion. Discussions should also be held with adjoining landowners to link with strategies that may be developing for similar issues.
DPLH (previously Department of Lands)	No response.
Department of Mines, Industry Regulation and Safety (previously Department of Mines and Petroleum)	Note the existing resources in the area, existing live tenements and pending tenements. The 2006 Strategy proposed a reserve was created across UCL at Hutt River which is also subject to a Live Tenement.
Department of Biodiversity, Conservation and Attractions (previously Parks & Wildlife)	Supports the use of SPP No. 2 when reviewing the Strategy. Should be the primary reference in relation to biodiversity and environmental matters. Recommends that tenure and biodiversity values are accurately reported within the Strategy. Also advises that the following Management Orders will not proceed without native title negotiations being completed: UCL (Location 11832) south of Hutt River mouth and the portion of Hutt Lagoon that is currently designated as UCL (between Port Gregory and Halfway Bay) and the area of UCL south of Hutt River excluding the portion of UCL over the beach.
Department of Primary Industries and Regional Development	No response.
Department of Sport and Recreation	No response.
Department of State Development	No response.
Department of Transport	No response.
Department of Water	No response.

Agency	Comment
Main Roads WA	<p>Halfway Bay</p> <p>Ideas to formalise the access arrangements at Balline Road and Northampton-Kalbarri Road intersection could include installing appropriate tourist and camping signage to notify drivers of the turn-off to Halfway Bay and Lucky Bay and extending the sealed length of Balline Road from the fishtails for 50m.</p> <p>Hutt River</p> <p>Out of the 4 access points, 1 access point should be formalised to provide access to Hutt River Mouth and the 3 remaining access points should be closed off and the road verge revegetated by the Shire of Northampton. Additionally, these access points are located on a bend in the road resulting in limited sight lines in in either one or both directions. Consequently, a site investigation would need to be undertaken by Main Roads WA to determine whether any of the access points meets Main Roads WA sight distance requirements.</p> <p>White Cliffs</p> <p>Proposed works to upgrade White Cliffs Road and Northampton-Kalbarri Road intersection could include installing appropriate tourist and camping signage to notify drivers of the turn-off to Little Bay and other nearby day use sites such as Stinky Point and Three Mile Beach.</p>
Midwest Development Commission	No response.
DPLH (previously State Heritage Office)	Looking for strategies for dealing with identified historic heritage within the subject area.
Telstra – Forecasting & Area Planning	At present, Telstra Corporation Limited has no objection. There are no projects in the database at present and Telstra may or may not be Infrastructure Provider of Last Resort (IPOLAR) in the future

Agency	Comment
Tourism WA	<p>Tourism WA considers the preparation of this document important as the Shire of Northampton contains significant coastal tourism destinations including Kalbarri, Port Gregory and Horrocks. These destinations provide a mix of accommodation, attractions and amenities for visitors to Western Australia seeking to experience the coastal environment.</p> <p>The Coastal Management Strategy should ensure that these tourism attributes are protected and maintained but also that provision is included to enable further development. This should include consideration of:</p> <p>Development of a coastal 4WD trail linking Kalbarri to Shark Bay</p> <p>Opportunities for the development/ upgrade of future and existing caravan park sites, noting that the Shire of Northampton was identified in the Brighthouse Report A Strategic Approach to Caravanning and Camping Tourism in WA 2012, as an area of high priority for new caravan parks</p> <p>Ensuring the coastal management supports access and visitor amenity to attractions along the coast such as the Kalbarri Coastal cliffs.</p>
Water Corporation	No response.
Western Power	The area is within the 'Danger Zone'. As your proposed work is near energised electrical installations and powerlines, the person in control of the work site must ensure that no person, plant or material enters the "Danger Zone" of an overhead powerline or other electrical network assets. Any information provided to you by Western Power should not be used in isolation and we recommend that you refer to the Occupational Safety and Health Act 1984 and Occupational Safety and Health Regulations 1996. These documents outline WorkSafe WA requirements for working near electricity.
Westnet Energy	No response.

# 9.0 ENVIRONMENTAL CHARACTERISTICS

## 9.1 INTRODUCTION

Coastal environments are highly dynamic and valuable ecosystems. They have significant economic value in terms of residential, tourism and recreational land uses. From a social perspective, coastal areas act as a meeting place for families and friends and are places in which a range of recreational activities can take place. It is important that the environmental value of coastal areas is not neglected in order to cater for social and economic values as these are inextricably linked.

This chapter includes a discussion and summary of the environmental features and values within the study area including climate, coastal geomorphology, coastal processes, water resources, vegetation and fauna. The information is sourced from a variety of references including (but not limited to) the Shire of Chapman Valley Coastal Management Strategy (Shire of Chapman Valley and Koltasz Smith, 2007) and the documents listed in Chapter 7 of this report.

This Strategy aims to address the requirements of State Planning Policy 2 (SPP2) Environmental and Natural Resources Policy through the recommendations and strategies included below. The objectives of SPP2 and how the Strategy aims to address these objectives is addressed in the Table 9.1 below.

**Table 9.1 – State Planning Policy 2 Objectives**

Objective	Comment
To integrate environment and natural resource management with broader land use planning and decision-making.	The strategies recommended in this Chapter consider protection, conservation and enhancement of the study area's natural resources and should be considered by decision-makers in future projects and actions along the coast.
To protect, conserve and enhance the natural environment.	The actions recommended in the CMS consider protection, conservation and enhancement of the study area's natural resources.
To promote and assist in the wise and sustainable use and management of natural resources.	Protection of the study area's natural resources through implementation of the actions recommended in the CMS will assist with the sustainable use of the coast.

## 9.2 CLIMATE AND CLIMATE CHANGE

The Mid-West region has a Mediterranean climate with mild to hot, dry summers and cool wet winters. Information on climate was obtained from the Bureau of Meteorology from the nearest stations including Willigulli North (rainfall) and Geraldton Airport (temperature). The average annual rainfall is 437.7mm with a majority of rainfall falling between May and August. Tropical cyclones occasionally bring heavy rains to the area. The average minimum and maximum temperatures throughout the year range from 13.0°C to 25.7°C. The coldest months are June to September and the warmest months are December to March (Bureau of Meteorology, 2017).

## 9.3 COASTAL GEOMORPHOLOGY AND SEDIMENT CELLS

The geomorphology and sediment cells of the study area are described in Eliot et al. (2013) and Stul et al. (2014). Landform mapping from Eliot et al. (2013) is included in Appendix A. A three-tier hierarchy of nested sediment cells for the area have been mapped by Stul et al. (2014) and included in Figure 9.1, with further detail on the extent of tertiary cells in the cells report. Cells were previously defined on a finer scale in Eliot et al. (2013) in Figure 9.2, which have been used on the landform maps and in the vulnerability assessment.

Coastal landform development on the microtidal Northampton coast, with low present-day supply of sediment, is subject to substantial control by the geologic framework. Control occurs through interaction of the fixed rocky topography, comprising the framework, with coastal processes and available sediments. The framework for the Northampton coast has been described at a variety of scales as part of a series of large-scale coastal compartments identified for the whole Western Australian coast (Eliot et al. 2011).

Modern Holocene sediments and inherited, remnant landforms abut and overlay the geologic framework. Both are reworked by present-day processes, although typically less for remnant landforms. The partly repetitive patterns of reworking define sediment transport behaviour at all scales. Landforms of the Northampton Region include:

1. A broad shelf plain between the Houtman Abrolhos and the shore;
2. A paleodelta associated with avulsion of the Murchison River with sand flats and sand banks interacting with inshore reefs, rock outcrops and platforms in the inshore waters; and
3. Salients, forelands, barred rivermouths, coastal dune

barriers and small dunes along the coast impounding lagoons and abutting cliffs.

These landforms provide an indication of the source areas, transport pathways and sinks; although they need to be established in relation to the processes driving coastal change. The local rivers provide localised intermittent sediment supply to localised areas of the Northampton coast.

The spatial distribution of alongshore sediment supply is affected by the degree of bypassing at rocky coastal features. This varies with shoreline aspect and may therefore be subject to decadal-scale fluctuations. Further offshore there is a broad shelf plain between the coast and the Houtman Abrolhos, with an absence of local reef ridges and inshore reef chains to provide a constraint to onshore sediment movement. It is unknown how sediment transported offshore from the beaches and inshore areas will be distributed on the broad shelf plain, and how available it is for return to the nearshore system. At the shore, the geologic framework in the form of cliffs and bluffs may constrain sediment transport to landward. However, if the onshore sediment supply is sufficiently substantial dunes may climb above the cliffs in areas with large sediment feeds onshore (northern extent of Sector 1).

The geologic framework in Sector 1 comprises a moderately high relief rocky cliffed coast with limestone reef influencing beach position. Sector 2 has a more variable coast with cliff to the south and a broadening distance between the limestone reefs and platforms and a higher calcarenite ridge, allowing for low-lying dunes and coastal lagoons, including the substantial Hutt Lagoon. The Hutt River and cliffs in the south of the Sector provide sediment to the coast, as indicated by dune activity. Sector 3 has a rocky ridge up to 40m high fronted by rock platform outcrops and rock ridges. Beaches and dunes are perched on the platform and against the degraded scarps and cliffs, interrupted with the barred river mouths at Oakabella Creek and Woolawar Gully.

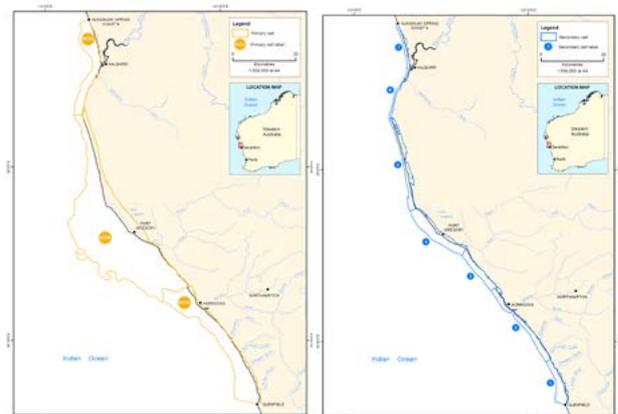


Figure 9.1: Primary and Secondary cells (Stul et al. 2014)

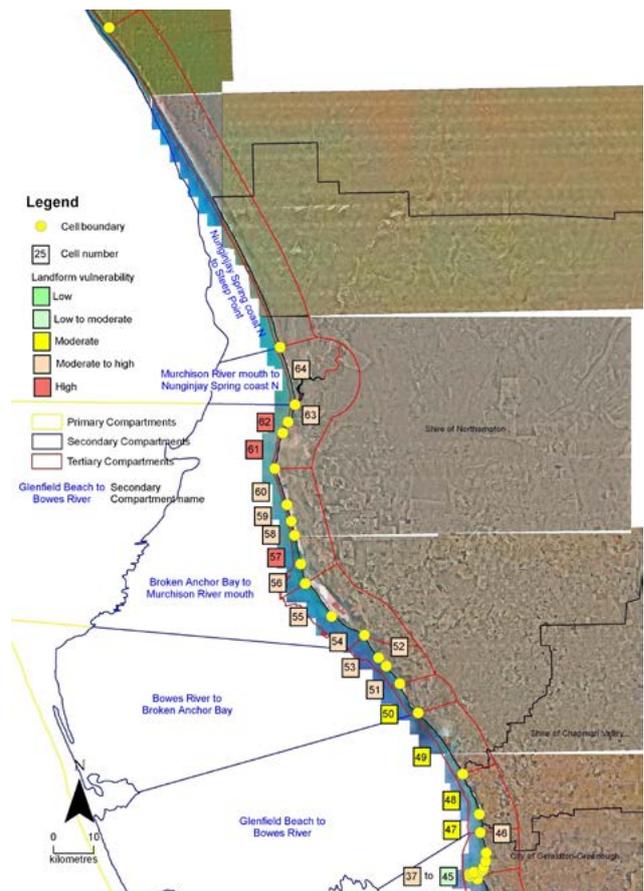


Figure 9.2: Previously defined smaller sediment cells (Eliot et al. 2013) used in coastal vulnerability assessment

## 9.4 COASTAL PROCESSES

The following section about coastal processes is based on the best available information and it is noted that there could be gaps in information and that updated information may be required to give a better picture of the coastal hazards and risks along the study area.

The objectives of SPP 2.6 are listed in Table 9.2 below, along with comment as to how this Strategy will help to achieve them.

**Table 9.2 – State Planning Policy 2.6 Objectives**

Objective	Comment
Ensure that development and the location of coastal facilities takes into account coastal processes, landform stability, coastal hazards, climate change and biophysical criteria.	The recommendations in this Strategy take into consideration coastal processes where information is available. It is recommended that further work is undertaken in this area as required.
Ensure the identification of appropriate areas for the sustainable use of the coast for housing, tourism, recreation, ocean access, maritime industry, commercial and other activities.	As is discussed in the Introduction (Chapter 1.1), detailed planning for tourism, industry and urban development is undertaken separate to this Strategy. However, reference is made to existing planning documents where relevant.
Provide for public coastal foreshore reserves and access to them on the coast.	Provision for public foreshore reserves is considered in detailed planning which is separate to this Strategy, however the Strategy acknowledges existing planning documents and reference made to the creation of new foreshore reserves.
Protect, conserve and enhance coastal zone values, particularly in areas of landscape, biodiversity and ecosystem integrity, indigenous and cultural significance	The actions contained in this Strategy have a particular focus on conservation and enhancement of the coastal zone values. Landscape and environmental values and heritage are addressed in the CMS.

## COASTAL VULNERABILITY

Coastal vulnerability at regional and sub-regional levels has been qualitatively assessed using analysis of coastal geology and landforms (Eliot et al.2013). The approach combined measures of susceptibility (potential for change) and sensitivity (observed coastal dynamics) to determine an overall index of coastal vulnerability. Susceptibility

ratings were determined from values assigned to marine topography near the shore, the shape of the shoreline, coastal orientation, and the prevailing landforms present in each cell. Similarly, instability ratings were based on the proportion of rocky versus sandy seabed, beach type and/or beachface shape, whether the frontal dune complex was eroded, and an overall estimate of vegetation cover on the sand barrier.

Determination of susceptibility and sensitivity was undertaken at the scale of individual coastal cells as summarised in the table below and the set of figures in Appendix A. These were combined through a matrix to determine five grades of coastal vulnerability for each coastal cell, as outlined below.

**Table 9.3 - Susceptibility and Sensitivity (Damara WA)**

		INSTABILITY (CONDITION)		
		(Existing morphologic change to land surface)		
		Low	Moderate	High
		Example		
SUSCEPTIBILITY (STRUCTURE) (Potential change to geological structure)	Low	(1) Vegetated swales in parabolic dunes landwards of a vegetated frontal dune ridge overlying coastal limestone above HWL	(2) Vegetated dunes landwards of a vegetated frontal dune ridge and perched on coastal limestone at HWL	(3) High foredune ridge and/or vegetated foredune plain overlying coastal limestone below HWL
	Moderate	Weakly lithified barrier with intermittent limestone outcrops	(3) Vegetated dunes landwards of a mainly vegetated frontal dune ridge (50 to 75% cover) and overlying coastal limestone	(4) Cluffed or discontinuous foredune fronting moderate numbers of mobile blowouts and sand sheets (<50% of the alongshore reach)
	High	Barrier comprised wholly of sand. No bedrock apparent along shore or in dunes	(3) Swales in parabolic dunes landwards of a partly vegetated frontal dune ridge	(4) Mainly vegetated dunes landwards of a partly vegetated frontal dune ridge with 25 to 50% cover

1	Low
2	Low to moderate
3	Moderate
4	Moderate to high
5	High

Landform-analysis provides a proxy measure of coastal vulnerability, as local-scale variations in landform characteristics or landform interactions may be more important than the broader landform classifications used to develop the vulnerability assessment. For this reason, the analysis was intended to be indicative rather than prescriptive and have application for strategic planning purposes as a first step to more detailed risk assessment procedures under the AS/NZS ISO 31000 framework. The outcomes of the study assigned a Susceptibility, Instability and Vulnerability rating of coastal compartments identified during the course of the project. These are shown in the table below.

**Table 9.4 – Susceptibility, Instability and Vulnerability Assessment (Damara WA)**

Stul et al. (2014) Primary Cell	Stul et al. (2014) Secondary Cell	Stul et al. (2014) Tertiary Cell	Eliot et al. (2013) Cell Number	Southern Boundary	Susceptibility Rating	Instability Rating	Vulnerability
R08B	R08B5	R08B5b	60	Waygoe Well	M	H	M-H
			59	Waygoe Well South	M	H	M-H
			58	Yanganooka	M	H	M-H
		R08B5a	57	Sandalwood Bay	H	H	H
			56	Shoal Point	M	H	M-H
	R08B4	R08B4b	55	Eagles Nest	M	H	M-H
		R08B4a	54	Broken Anchor Bay	M	H	M-H
	R08B3	R08B3a	53	Menai Cliffs	M	H	M-H
			52	White Cliffs	M	H	M-H
			51	Whale Boat Cove (Little Bay)	M	H	M-H
R08A (extends further S)	R08A2	R08A2b	50	Bowes River	L	H	M
		R08A2a	49	Coronation Beach	M	M	M

The assessment of Eliot et al. (2013) considered 12 cells in the study area, corresponding to seven tertiary cells in Stul et al. (2014). The majority of Sectors 1 and 2 are mainly moderate susceptibility, high instability and moderate-to-high vulnerability (Eliot et al. 2013). Moderate-to-high vulnerability suggests coastal risks are likely to be a significant constraint to coastal management. Halfway Bay (Sandalwood Bay to Yanganooka) is located in the area of highest vulnerability. Sector 3 (Cell 49 or R08A2a) has moderate vulnerability.

## COASTAL HAZARDS

The below information is from Eliot et al. (2013), Stul et al. (2014) and Land Insights (2015). The Northampton coast is located towards the northern end of the temperate region, which means coastal hazards are predominantly associated with mid-latitude storm systems, although very rare tropical

storms have provided severe conditions in the past, notably through southward travelling tropical cyclones. The region is subject to heat-driven winds, including regular strong sea-breezes, northerly thunderstorms and pre-frontal troughs.

The region is microtidal and mainly diurnal, which determines that storm surges and other water level phenomena such as caused by the Leeuwin Current have a strong influence upon inundation. The largest surges measured along the coast have been associated with southward travelling cyclones, capable of producing surge and shelf waves simultaneously, although the most severe conditions are more commonly associated with mid-latitude storms, as their frequency and persistence allows greater opportunity for interaction with high winter tide levels.

The coast is exposed to large Indian Ocean swell waves, although nearshore reef systems commonly present may provide considerable damping before reaching the shore. Wind waves occur frequently along the coast, and generally peak on a daily basis with afternoon sea breezes.

Coastal processes, including erosion and inundation hazards, are strongly influenced by the coastal morphology present along the Northampton coast (Chapter 9.3). Along the whole coastline, rock features have important influences upon the coastal behaviour, whether headlands acting as controls to beach position, reef systems providing wave sheltering or rock platforms providing a foundation for perched dunes. These natural structures typically influence present-day coastal mobility, but increase the susceptibility to erosion associated with changing conditions (including sea level rise) or the transfer of erosive stress when efforts are made to stabilise a small section of coast.

Sector 1 from Halfway Bay to Bluff Point is a moderate high relief rocky cliff coast, subject to very gradual erosion through wave action. The high elevation limits inundation hazard. The beach and active parabolic dunes are perched on and behind a relatively continuous limestone reef. The beach position varies by up to 150m as sediment is moved and trapped landward of the reef. Sediment is presently accumulating at the southern half of Halfway Bay, which is limiting the amount of sediment able to transport to the north (Figure 9.3). The broader foreshore is subject to dune activation by ORV use, smothering and dunes climbing above the cliffs in the north (Figure 9.4).

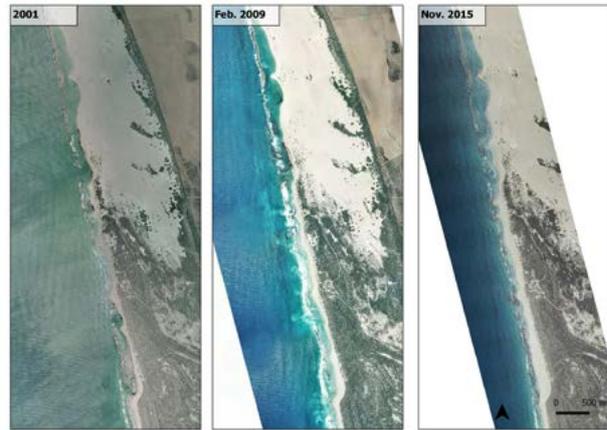


Figure 9.3: Variability in beach position at Lucky Bay and Halfway Bay. Note the accretion in the south and erosion in the north (Source: Landgate)



Figure 9.4: Dune activity of >75m movement in 14 years at Wagoe (Source: Landgate)

In Sector 2, the distance between limestone reefs and a much higher calcarenite ridge to landward varies from zero up to three kilometres. Where the distance between reef and ridge narrows, increased beach mobility occurs where the reef levels are lower. Where the distance widens, the coast is comprised of extremely low-lying landforms and coastal lagoons, with moderate height coastal dunes at the southern end, and blowouts indicating active sand supply. Sand is supplied from the south, from cliff erosion and from intermittent supply from the Hutt River. There is high beach position and landform variability in this Sector. Due to the role of the reefs, this coast is highly sensitive to variations in water level, with relict features north of the Hutt lagoon indicating that the area has previously been occupied as a tidal creek network, implying landform instability. Extensive shore-connected sand sheets are present along the northern part of this coast, which are highly active due to sea-breezes. The patterns of erosion and sedimentation at Port Gregory have provided a hazard for the placement of permanent refueling and boat launching infrastructure. Further explanation on the coastal variability at Port Gregory is explained in a sub-section below.

The coastline of Sector 3 is constrained between low limestone reefs and a higher calcarenite ridge to landward within several hundred metres. The ridge is intermittently overlain by perched dunes, mainly located near to creek mouths. Increased coastal mobility typically occurs where the reef levels are lower, which also occurs mainly near the mouths of Oakabella Creek and Woolawar Gully (Figure 9.5). The high elevation to landward limits inundation hazard to the coastal margin only. Dune activation by ORV use is a hazard in this sector.



Figure 9.5: Woolawar Gully and Oakabella Creek (Source: Landgate)

Natural hazards that may directly affect a coastal site include erosion, marine inundation, king waves, rip currents and tsunamis. Runoff flooding, bushfires, landslides and earthquakes may affect the site directly, but may also be significant indirectly, by disrupting site access. Site characterisation includes a classification for natural hazard risks based on a relative comparison of different types of coastal site and their use. In general, more populated sites are expected to have a lower likelihood of being affected by natural hazards, although this may be offset by more intensive hazard mitigation. Day use sites have no population except visitors and a low value of infrastructure that implies a high tolerance for natural hazard risk. This applies to the coastline within this study area.

The levels of hazard assessment and warning system likely to be appropriate for a day use site and camping node are outlined in Table 9.5 below.

**Table 9.5 – Site classification, hazard assessment and warning system**

Site Classification	Hazard Assessment	Warning System
Tourism Node	Hazard evaluated, with trigger for site closure identified	Warning system developed, with a responsible agent & ability to close site access
Minor Tourism Node		
Camping Node		
Day Use Site	Hazard indicators assessed as part of site selection	Hazard clearly self-evident or warning signs erected

Source: Eliot I, et al., (2012)

An important consideration is the location of formal camping areas and whether these areas are at risk from coastal hazards in the future. A formal camping area is provided north of Halfway Bay and coastal shacks are located at Halfway Bay. A small townsite is also located at Port Gregory. The majority of coastal infrastructure that would be at risk are located at these sites. There is little reliable information available on coastal hazards and risks, therefore it is recommended that a Coastal Hazard and Risk Management Adaptation Plan (CHRMAP) is prepared for the study area to identify important assets, areas at risk and future actions. The Batavia Local Emergency Management Committee is also available to provide assistance in the event of an emergency.

## COASTAL VARIABILITY AT PORT GREGORY

The variability in sediment supply, beach position in lee of limestone reefs and dune activity at Port Gregory is discussed in this section with a focus on jetty function.

The jetty was constructed in 1980 (Figure 9.6) replacing the pre-1955 jetty. Increased sedimentation at the jetty occurred from 2001 to 2012, with refueling no longer possible from 2012 (Figure 9.7). This pattern of sedimentation can be observed from aerial imagery and bathymetric records (Figure 9.8).

This sedimentation appears to be linked to sediment supply and dynamics across the broader tertiary sediment cell (Figure 9.9). Sediment is supplied from the south, from cliff erosion and from intermittent supply from the Hutt River. Sand is then transported into the lagoon along the shore and over the reef system (Figure 9.10). The enhanced sedimentation since 2001 could be attributed to the increased intermittent sediment supply from the Hutt River, and river mouth, in the 1990s (Figure 9.11; Figure 9.12). There was a lag as sediment was transported along the coast, into the lagoon and along the lagoon to Port Gregory townsite. Due to the role of the reefs, this coast is also highly sensitive to variations in water level with higher mean sea levels occurring in the period of 2008 to 2013 associated with a strong La Nina. This period of higher water levels may have mobilised sediment over the reef.

It is anticipated sedimentation will continue, but at a slower rate.

Members of the community have questioned if the dredging from Geraldton Harbour contributed to the sedimentation at Port Gregory. The dredging at Geraldton Harbour would have no impact on the sedimentation at Port Gregory, which in part can be demonstrated by the mapped sediment cells (Stul et al. 2014; Figure 9.1; Figure 9.9; Figure 9.10). At the broadest scale, the majority of functional sediment movement (primary cells) in the area occurs between Whale Boat Cove and Bluff Point. However, the majority of sediment supply the Port Gregory coast is from the cliffs south of Broken Anchor Bay, from the Hutt River, bioproduction and reworked sediment from the reefs and from sand stored in the dune systems. This is demonstrated by the observed landforms (Appendix A of Eliot et al. 2013). The dredging at Geraldton Harbour produced a large quantity of very fine sediment from dredging through limestone. If any of that fine material reached Port Gregory it would not be able to contribute to sedimentation as it would be transported offshore by wave and current action.

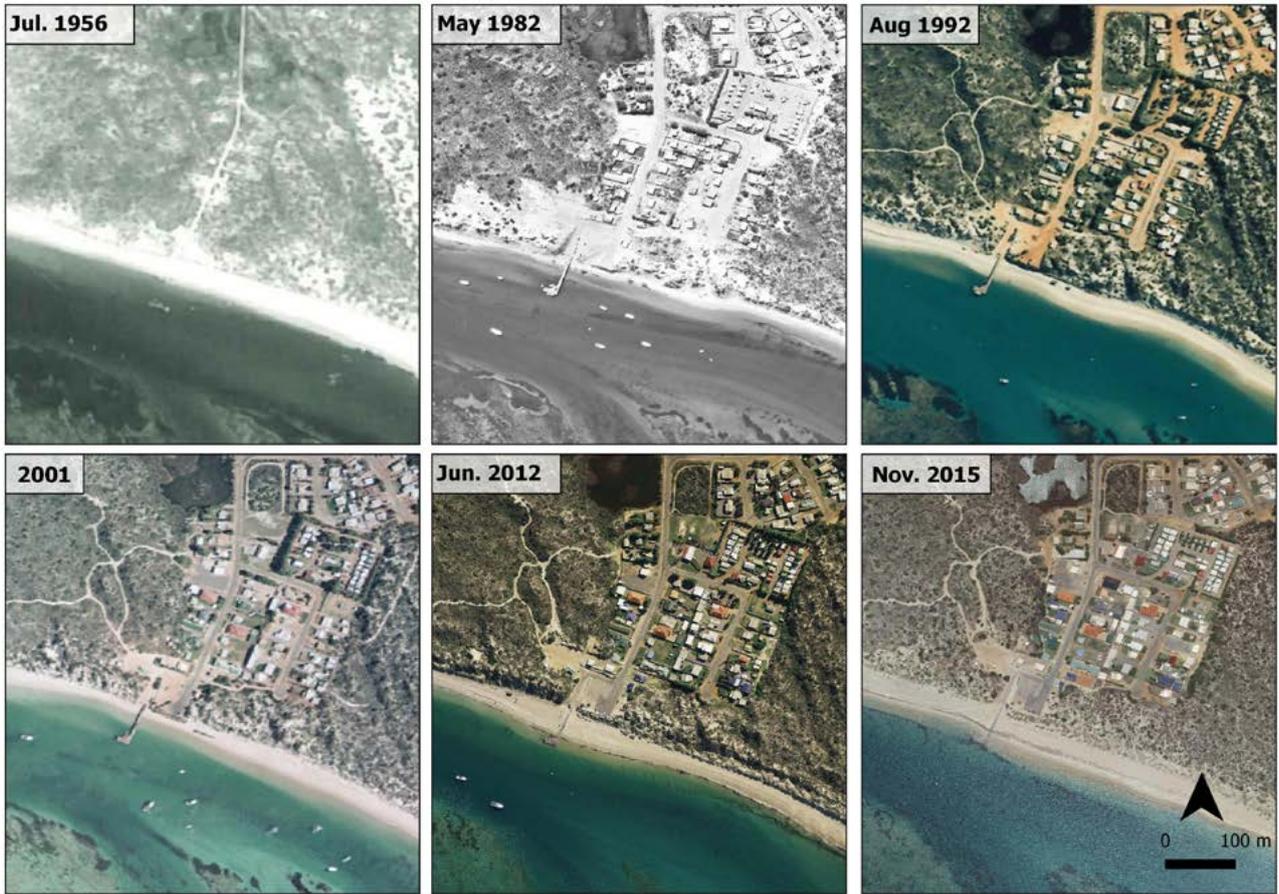


Figure 9.6: Coastal position fluctuations at Port Gregory 1956 – 2015 (Source: Landgate and Department of Transport)



Figure 9.7: Variability in beach position and beach width at Port Gregory Jetty 2009-2015 (Source: Landgate)

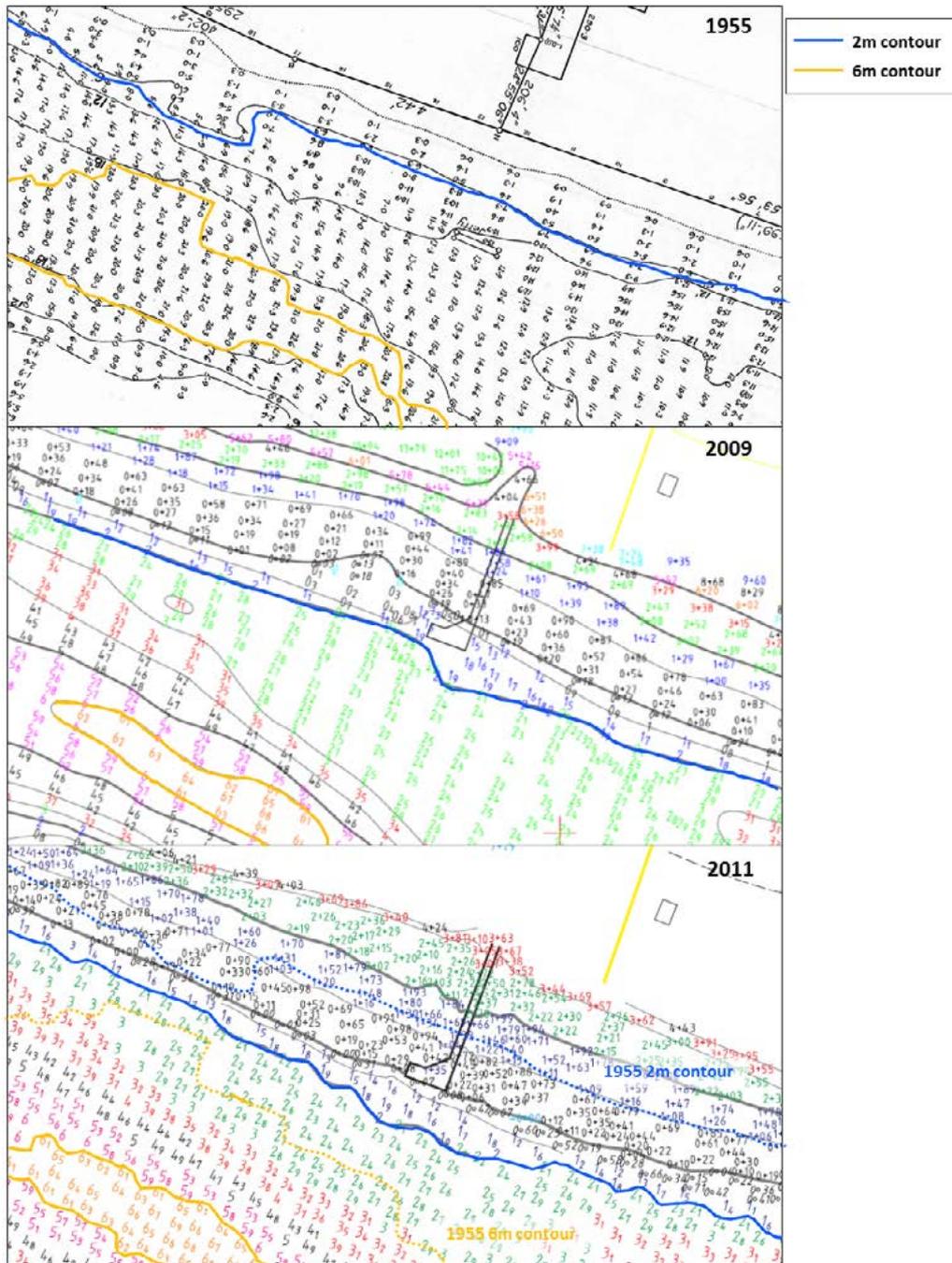


Figure 9.8: Changes in Bathymetry from 1955 to 2011 near the jetty (Source: Department of Transport and Public Works Department)

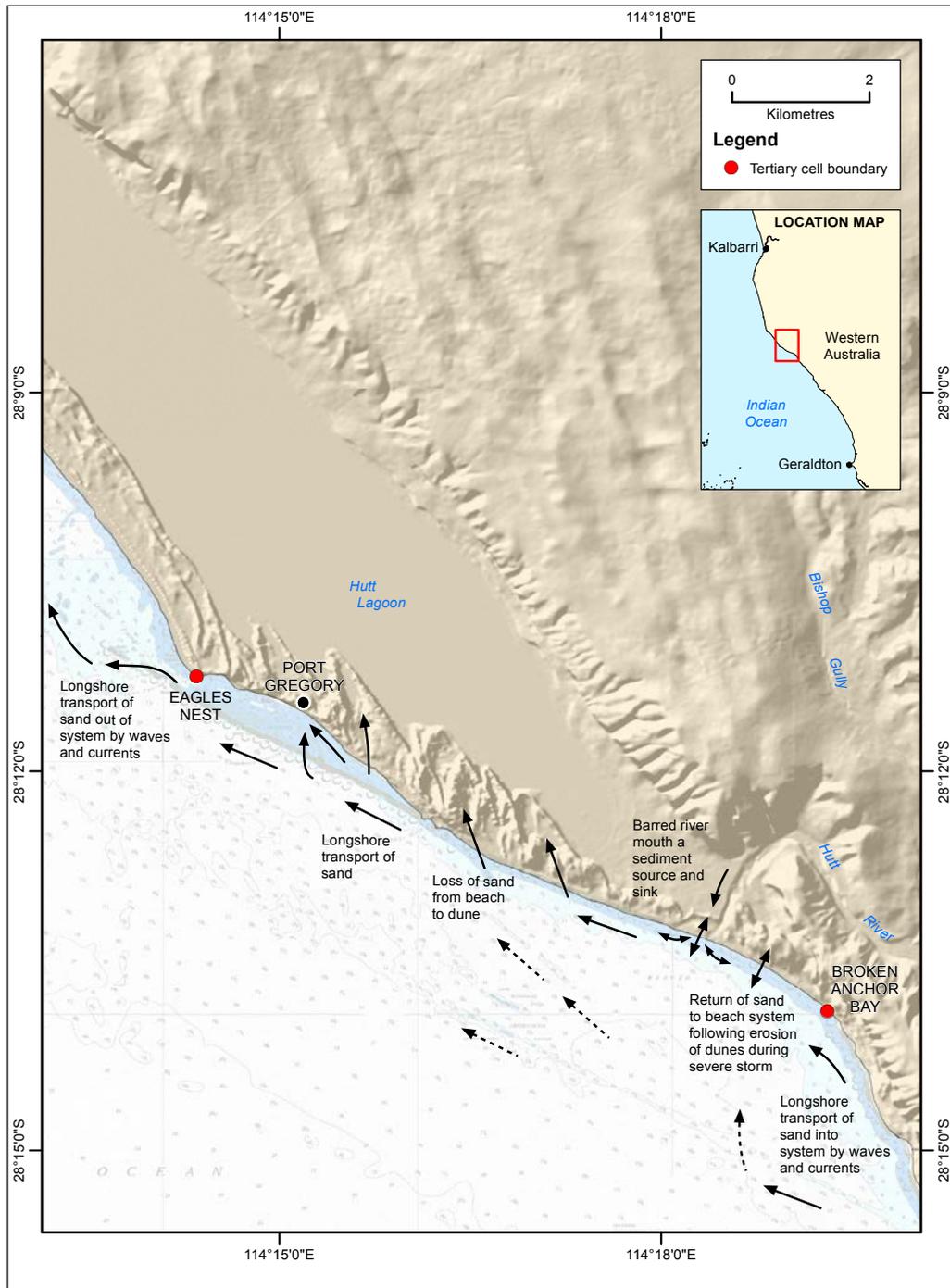


Figure 9.9: Annotated image showing factors contributing to accretion at Port Gregory (Source: Stul et al. 2014).

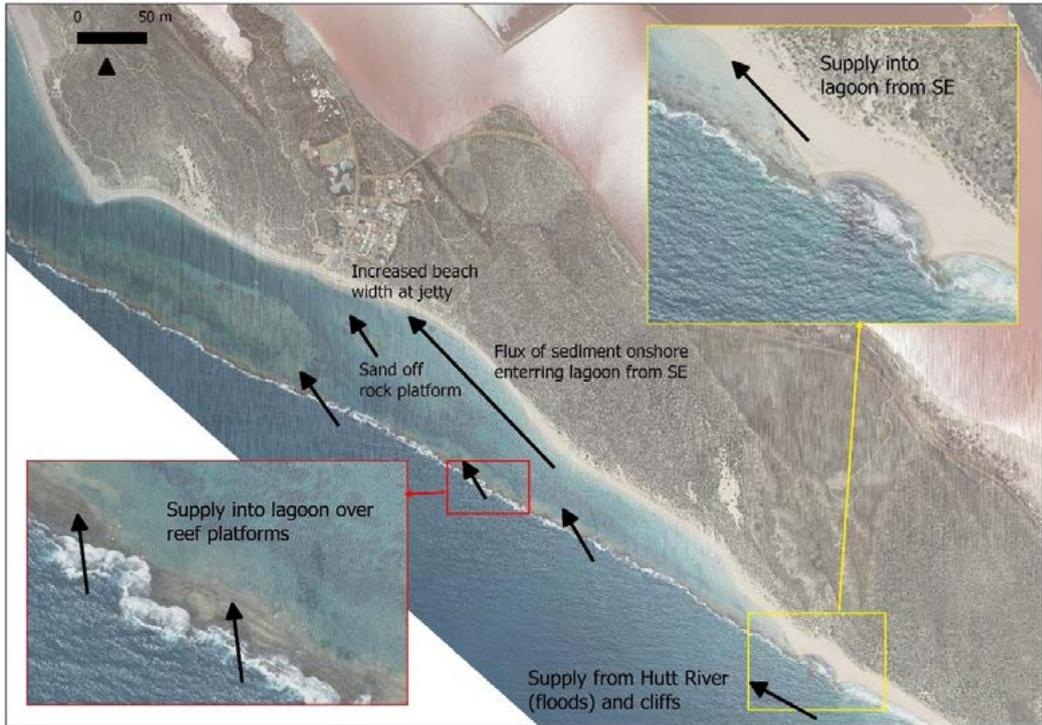


Figure 9.10: Annotated image within lagoon of Port Gregory (Image: Landgate 2015)



Figure 9.11 – Hutt River mouth showing capacity for sand storage and release (Source: Landgate)

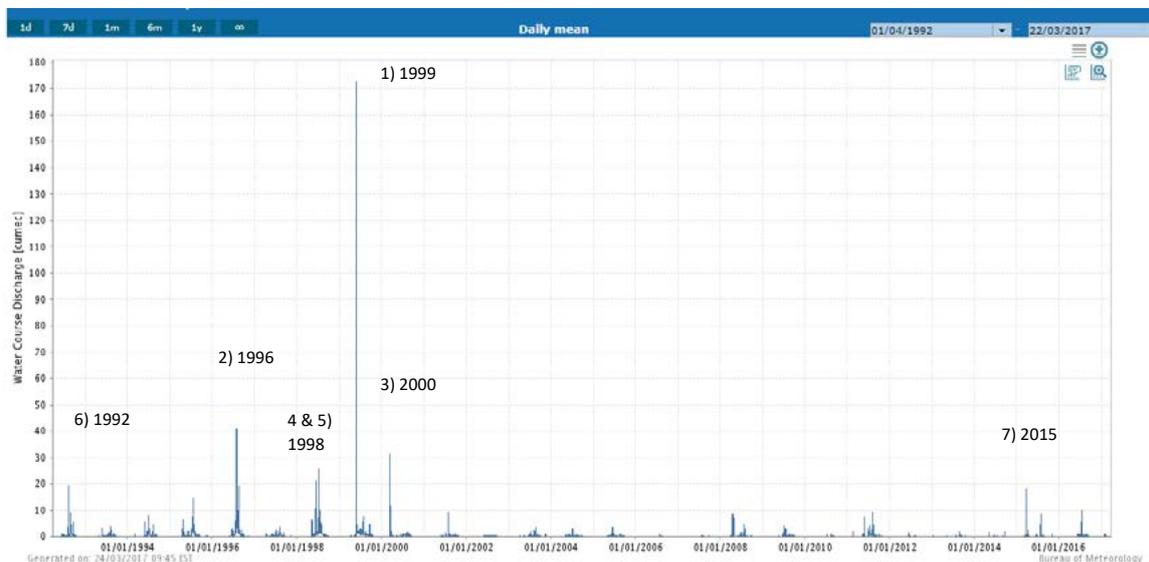


Figure 9.12- Hutt River daily mean flows at Yerina Station (10km upstream of mouth) since 1992 (Source: Bureau of Meteorology)

## 9.5 VEGETATION AND FLORA

The vegetation and flora within the study area can be described from a variety of sources including the Shire of Northampton Coastal Strategy 2006, the Geraldton Regional Flora and Vegetation Study (DPLH, 2010) and the Northern Batavia Coast Flora and Vegetation Surveys (DPaW, 2011).

### VEGETATION DESCRIPTION

#### BATAVIA COAST STRATEGY

The Batavia Coast Strategy (Batavia Coast Coastal Planning Group, 2001) indicates that coastal dune vegetation of the area includes *Spinifex longifolius*, *Olearia axillaris*, *Atriplex isatidea*, *Scaevola crassifolia* and *Scirpus nodosa*, with acacia-banksia scrub on sand over limestone, and *Acacia rostellifera* and *Melaleuca cardiophylla* thickets on limestone ridges.

#### SHIRE OF NORTHAMPTON COASTAL STRATEGY 2006

For the purposes of this Strategy a botanical survey was not carried out. Vegetation was noted and described in the 2006 Coastal Strategy (Landvision and Shire of Northampton, 2006) and included below.

Frontal dunes are generally dominated by *Spinifex longifolius*, *Atriplex isatidea*, *Tetragonia decumbens* and, in

places, *Angianthus cunninghamiana*, with the shrub *Olearia axillaris* often prominent towards and on the frontal crest. Other species on the frontal dune in different locations included *Carpobrotus virescens*, *Cakile maritima*, *Atriplex cinerea*, *Senecio lautus*, *Isolepis nodosa*, *Arctotheca calendula*, *Salsola kali* and, on the crest and rear slopes, *Zygophyllum* sp., *Threlkeldia diffusa*, *Enchylaena tomentosa*, and the shrubs *Acacia rostellifera*, *Scaevola crassifolia*, *Nitraria billardieri*, *Myoporum acuminatum* and *Rhagodia preissii*.

In well vegetated swales and secondary dunes behind the frontal dune, *Acacia rostellifera* and *Olearia axillaris* are the most widespread species, with *Rhagodia preissii*, *Scaevola crassifolia*, *Myoporum acuminatum*, *Melaleuca cardiophylla*, *Isolepis nodosa* and *Acanthocarpus preissii* also prominent in some locations. Other species variously found in these better vegetated dunes and swales include those mentioned on the frontal dune above together with the groundcovers and climbers *Cassytha racemosa*, *Clematis pubescens* and *Kennedia prostrata*, and the shrubs *Acacia xanthina*, *A. lasiocarpa*, *Anthocercis littorea*, *Exocarpus sparteus*, *Frankenia pauciflora*, *Guichenotia ledifolia*, *Phyllanthus calycinus*, *Templetonia retusa*, *Stylobasium spathulatum* and *Melaleuca lanceolata*.

On revegetating sandsheets, *Acacia rostellifera*, *Olearia axillaris* and *Spinifex longifolius* are noticeable, while in revegetating deflation basins below these sandsheets *Angianthus cunninghamiana*, *Isolepis nodosa*, *Scaevola*

crassifolia and, in places, Sporobolus virginicus tend to be prominent.

In certain areas invasive weeds such as wild oats and brome, Geraldton carnation weed, (*Euphorbia terracina*) and ice plant (*Mesembryanthemum crystallinum*) are evident. The Boxtorn (*Lycium ferocissimum*) is a worrying invader in many areas, notably around, and south of Bowes River. Swampy areas behind the frontal dune at Hutt Lagoon support a different suite of species – *Halosarcia* sp., *Sporobolus virginicus* and *Juncus* sp.

## GERALDTON REGIONAL FLORA AND VEGETATION SURVEY

The Geraldton Regional Flora and Vegetation Survey (GRFVS) was prepared by the then Department of Planning (now DPLH) and Ecoscape in 2010. The study area extends from Coronation Beach Road (Shire of Chapman Valley) to Devlin Pool Road (south of Greenough River), and east to the foothills of the Moresby Range. While the study area does not extend to the Shire of Northampton, it can nevertheless provide some context on the vegetation and flora within the Shire.

The GRFVS identifies the Beard vegetation associations within the Shire of Northampton include the following. An image from the GRFVS showing the location of these vegetation associations is included in Figure 9.13 below.

From Woolawar Gully to Horrocks

- 359 Shrublands; *Acacia* and *Banksia* scrub (inland)
- 440 Shrublands; *Acacia ligulata* open scrub (along the coast)

Broken Anchor Bay

- 371 Low forest: *Acacia rostellifera* (inland)
- 387 Shrublands; *Melelauca cardiophylla* thicket (inland)
- 413 Shrublands ; *Acacia neurophylla* and *A. species* thicket (along the coast)

Port Gregory to Wago

- 129 Bare areas; drift sand
- 440 Shrublands; *Acacia ligulata* open scrub



Figure 9.13 Geraldton Regional Flora and Vegetation Survey - Beard Vegetation Associations (DPLH and Ecoscape, 2010)

The plant communities identified in the GRFVS in the northern part of Chapman Valley were:

- Near Coastal: *Acacia rostellifera* shrubland (ncAr)
- Coastal: *Acacia rostellifera* low shrubland (cAr)

These vegetation communities are likely to exist along the Northampton coast as well.

## DUNE EROSION

Disturbance to vegetation is largely caused by uncontrolled pedestrian and vehicle access. While dune vegetation is naturally sturdy to survive the relatively hostile coastal conditions, they are susceptible to severe damage if disturbed by foot or vehicle. Removal and death of vegetation exposes dunes which become susceptible to erosion. This can lead to major erosion issues such as dune blowouts. It is possible for dune blowouts to become so large that they threaten to cover roads and structures. While this hasn't occurred in the study area, it could be a concern as the area becomes more popular over time.

The vegetation along the coast is largely undisturbed owing to the low-level of development and to low-key nature of most of the sites. There are some localised areas where vegetation has been disturbed and revegetation and management is required and these areas are typically associated with high use areas such as Lucky Bay/Halfway Bay and Port Gregory surrounds. Vegetation and dune erosion has become more of an issue in recent years as off-road vehicles such as dune buggies, quad bikes and trail bikes are becoming cheaper and more accessible to a larger percentage of the population which leads to an increase in this activity.

It is important that vehicles and pedestrians are controlled to ensure they keep to designated roads and paths to avoid unnecessary vegetation damage. This can be achieved through signage, fencing, revegetation, patrolling the area and through driver education. The provision of formal areas for ORVs and RRVs was previously considered in the NACC Feasibility Study (NACC, 2015). The purpose of these areas

will be to encourage drivers to use designated sites rather than driving through other areas. No formal ORV areas were proposed in the NACC study within the Shire.

Dunes can be restabilised using a number of different coastal rehabilitation techniques including:

- Brushing – laying branches of native coastal vegetation on dunes which will bury seed on the branches and encourage germination of plants
- Matting – placing fibre matting over dunes like a carpet to suppress weeds and to stabilise dunes from wind erosion
- Replanting Coastal Species – planting seedlings or transplanting cuttings of native coastal species rapidly aids in dune stabilisation
- Removing the source of disturbance such as pedestrians and vehicles.

Areas in need of dune stabilisation should be rehabilitated using an appropriate technique as defined by best practice management. The Coastal Planning and Management Manual by the WAPC (2003) should be referred to for methods on dune rehabilitation.

## 9.6 WEEDS

A weed is a plant growing where it is not wanted. Weeds will compete with local native vegetation for light, nutrients, space and water. Often weeds are naturalised into the coastal environment from gardens. In the past, plants such as Pyp Grass were purposely introduced as a rehabilitation species and have ended up becoming a weed.

One of the more invasive weeds in the region is African Boxthorn (*Lycium ferocissimum*) which was originally introduced into Australia from South Africa. All boxthorn species in Australia are perennial thorny shrubs which produce berries, with white or purple flowers and petals joined in a tube at the base. African Boxthorn is considered a major problem because it invades native vegetation, alters habitat and the thorny spikes can puncture tyres. It forms dense, impenetrable thickets that exclude other plants; provides shelter and food for feral animals such as foxes, rabbits, rats, starlings and sparrows and reduces access for stock, native animals, people and vehicles.

NACC has undertaken an extensive African Boxthorn management program which has involved poisoning individual plants and, once dead, removing plants to allow native vegetation to regenerate. They are involved in the mapping and removal of African Boxthorn from coastal dunes from White Cliffs south to the shire boundary. White Cliffs is the northern-most boundary of the regional boxthorn infestation that covers the Shires

of Irwin, Chapman Valley, Northampton and the City of Greater Geraldton. It is crucial that African Boxthorn is not permitted to spread northwards to infest riparian vegetation around Hutt Lagoon and the Murchison River.

## 9.7 FAUNA AND HABITAT

The Hutt Lagoon is an important feeding ground for migratory shorebirds and NACC support community monitoring that contributes to national Birdlife Australia surveys.

The DBCA has advised that a small 'sub-lagoon' located within Hutt Lagoon is an important feeding area for migratory birds over the summer. Given the dramatic decline in some species of migratory birds over the last 20 years this site has considerable environmental and tourism value. The biological value of the Shire of Northampton coastline is the intertidal habitat where migratory shorebirds rest and feed. Many of Australia's shorebird species have suffered serious decline in recent years. Disturbance to migratory species is greatest where increasing human populations and development pressures may have an impact on important habitats such as aircraft over-flights, industrial operations and construction, artificial lighting, and recreational activities such as fishing, off-road driving on beaches, unleashed dogs and jet-skiing (Department of Environment, 2015). The DBCA has advised that although the number of birds using this length of coastline may not be considered as significant there are a number of species that use the entire length for feeding and roosting.

No fauna or habitat studies have been undertaken within the study area. However, as fauna are mobile, and vegetation communities are similar to nearby local government areas, the following information has been described from a variety of sources including the Chapman Valley Coastal Management Strategy and Action Plan (Land Insights, 2016), the Buller Local Structure Plan (GHD, 2015) and the Environmental Review Report for the Oakajee Industrial Estate (Parsons Brinckerhoff, 2012).

## SHIRE OF CHAPMAN VALLEY COASTAL MANAGEMENT STRATEGY AND ACTION PLAN 2016

The Shire of Chapman Valley Coastal Management Strategy and Action Plan (2016) refers to a fauna assessment of the proposed Oakajee Industrial Site undertaken by Dames & Moore (1993). The study suggests that the low heath and vegetation is likely to provide relatively few habitats and therefore dunes are expected to support small fauna populations. However, the available distribution data for vertebrate fauna in the Geraldton Region indicate that a diverse suite of bird species may visit the area and that a number of reptiles and native mammals may also be present (Land Insights, 2016).

The Dames and Moore report indicated that there could be up to 230 bird species which might occur within the Oakajee area. It listed 18 species of mammals recorded from, or thought to possibly occur near Oakajee. Of these, seven are feral, domestic or pest species. Muir Environmental (1997) reported that most of these species are fairly common, apart from the Dibbler (*Parantechinus apicalis*) which has been found only a few times on the mainland in recent years. The Dibbler is currently known from Whitlock and Boullanger Islands, Jurien Bay, and Fitzgerald River National Park on the south coast.

## ENVIRONMENTAL REVIEW REPORT FOR THE OAKAJEE INDUSTRIAL ESTATE

The most recent vegetation studies for the Oakajee Industrial Estate include the Oakajee Port and Rail Public Environmental Reviews (Ecologia, 2010). The Environmental Review Report by Parsons Brinckerhoff (2012) provides a discussion on the outcomes. A total of 22 mammals, 161 birds, 105 reptiles and 15 frog species are expected or known to utilise the wider area. Of these 32 are species with recognised conservation significance including:

- Four EPBC Act listed migratory bird species – Fork-tailed Swift, Eastern Osprey, Whitebellied Sea-eagle and Rainbow Bee-eater
- Two Priority 4 bird species listed by DPaW – White-browed Babbler and Australian Bustard
- One Priority 4 species listed by the DPaW – Western Carpet Python, which is also listed as a Schedule 4 species under the Wildlife Conservation Act
- Northern and southern forms of the Fossorial skink, an undescribed worm lizard currently awaiting taxonomic classification, and several fauna species at or near the northern limit of their range.

It is relevant to note that Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) has been previously sighted in the region, however there is limited suitable feeding habitat

and the Oakajee area is unlikely to be a major source of food for local populations, with no nesting or breeding habitat available.

## BULLER LOCAL STRUCTURE PLAN

A flora and fauna survey was undertaken in 2007 and 2008 across the Buller Structure Plan area by a qualified botanist and environmental scientist to a level 2 survey requirement. A number of fauna species, predominately birds, were observed. The results of a search of the WA Museum database and from the opportunistic survey conducted at the Site, indicate that potentially 145 species of birds, 27 mammals, 80 reptiles and 11 amphibians could utilise or pass over the structure plan area.

## FERAL ANIMALS

Feral animals such as rabbits, foxes, goats and cats can cause general disturbance to coastal areas including dune erosion, destruction of native vegetation and the spread of weeds. They also compete with native fauna for habitat and resources. Control of rabbits, foxes, rats and feral cats can be achieved through baiting, trapping and poisoning. Landowners should work with the Department of Primary Industries and Regional Development (previously the Department of Agriculture and Food) to undertake feral animal control where necessary.

## 9.8 DIEBACK

Dieback is the name given to a fungal disease that affects over 2300 native plant species. *Phytophthora cinnamomi* is the most common form of dieback. Vehicles, pedestrians and animals are the main transporters that spread the dieback fungi spores. Certain plant families such as Proteaceae and Epacridaceae are particularly susceptible.

While there is no evidence of dieback occurring within the study area, landowners and the Shire should be vigilant of this issue and should any signs of dieback occur appropriate action should be taken. Signs which should be looked for include browning and chlorosis of the leaves and branch death.

The Dieback Working Group has a number of publications available such as *Managing Phytophthora Dieback Guidelines for Local Government 2009* which can be referred to if signs of dieback become evident. The best course of action is to prevent the spread from infected areas to non-infected areas so they should be blocked from access if possible to prevent the spread of soil particles and drainage managed appropriately to prevent its spread in water.

## 9.9 WATER RESOURCES

### SURFACE WATER FEATURES

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Two watercourses, Bowes River and Hutt River, discharge to the ocean in this section of the coast (the Bowes south of Horrocks and the Hutt south of Port Gregory). Two minor watercourses, Woolawar Gully and Oakabella Creek, discharge at the southern end of the Shire. The river mouths are popular camping and day use sites. Woolawar Gully and Oakabella Creek are ephemeral which means they only flow during high rainfall events. Bowes River and Hutt River mouths change with rainfall events .

Hutt Lagoon is a large coastal salt lake behind Port Gregory, separated from the ocean by a narrow band of coastal dunes. Further north, in the vicinity of Halfway Bay, there is a chain of marshes and swamps east of the coastal dunes which contain surface water in winter, creating wet and boggy conditions on the access route into and through this particular site (Landvision and Shire of Northampton, 2006).

### GROUNDWATER

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The Northampton coast is situated in the Gascoyne Groundwater Management Area where groundwater is contained within weathered granite, dykes or fractures, and where quantity, quality and rate of recharge is highly variable. Along this coastline generally, small supplies of potable water can be found in unconfined aquifers in the Tamala limestone and in unconsolidated coastal sands (Landvision and Shire of Northampton, 2006).

## 9.10 BUSHFIRE

Fire is a natural phenomenon in the Mid West Region which is largely caused or influenced by summer droughts, lightning storms, campfires or are deliberately lit. Bushfire management is important as a means to reduce risk to human lives and property and to reduce significant destruction to native vegetation. Fire management procedures include:

- Prescribed burning
- Strategic firebreaks
- Use of barbeques rather than open campfires
- Prohibited burning period
- Adequate signage at coastal sites
- Fire risk assessments
- Fire Management Plans.

It is essential that any new development proposals along the coast adequately consider fire management in accordance with the WAPC guidelines, specifically SPP 3.7

Planning for Bushfire Management (WAPC, 2015) and the Australian Standards AS 3959. This is particularly important in areas recognised as having a significant or high bush fire risk. Responsible land managers along the coast should have appropriate fire management procedures in place. The Shire should have bushfire safety measures in place for their coastal reserves, including evacuation procedures.

# 10.0 CULTURAL & SOCIAL CHARACTERISTICS

## 10.1 INTRODUCTION

This chapter provides the social and cultural context of the study area including a review of the land tenure, zoning, land use values, access, facilities and heritage. The information is sourced from a variety of references including (but not limited to) the Northampton Coastal Strategy (Landvision and Shire of Northampton, 2006) and the documents listed in Chapter 5 of this report.

## 10.2 LAND MANAGEMENT AND TENURE

Coastal tenure along the study area varies from freehold, Unallocated Crown Land (UCL) and reserves. Tenure is summarised in the table below:

**Table 10.1 – Tenure Overview**

Area	Tenure	Management
Wagoe (or southern boundary of Kalbarri National Park) to Halfway Bay (including Lucky Bay)	Reserve (R35206) with no management orders.  The Shire has requested vesting of a portion of R35206 for controlling camping nodes, but this only extends to just north of Lucky Bay, and does not extend to National Park boundary. If the Shire does not itself pursue management of this proposed area, management by the native title claimants, or co-management with them, could be explored.	The Department of Primary Industries and Regional Development (listed as the Department of Regional Development and Lands on the reserve document) are responsible for this reserve as it currently has no management orders assigned. Planning approval has been issued by the Shire to the Wagoe Quad Bikes and Chalets to operate quad bike tours on the reserve and a licence has been issued from the DPLH (previously DoL). The owners of Wagoe Quad Bikes and Chalets undertake a lot of management in this area.  The Shire will be responsible for management of the area to just north of Lucky Bay following the finalisation of the management orders.
Half Way Bay	Reserve (R34945) management orders with the Shire of Northampton and UCL.	Shire of Northampton manages the reserve. The Shire currently has an undetermined application to extend R34945 to just north of the shacks which are currently outside of the boundary of this reserve.
Halfway Bay to Port Gregory	UCL.	DPLH, but subject to native title claim.  No current active management body.
Port Gregory foreshore	Townsite is mixture of freehold, Reserve (R36615) management orders with Minister of Transport (includes the jetty and car park), Reserve (R50063) management orders with the Shire of Northampton (includes the toilets).	The jetty, car park and gravel car park is managed by the Department of Transport. The public toilets are managed by the Shire. The remainder of the beach and coastal areas are UCL which have responsibility with DPLH, but subject to native title claim and no current active management body.
Port Gregory to Hutt River Mouth	UCL.	DPLH, but subject to native title claim.  No current active management body.

Area	Tenure	Management
Hutt River Mouth	Mixture of Freehold and UCL within the rivermouth and along the coast, Reserve (R48584) management orders with the Shire of Northampton along the river foreshore.	Freehold areas are the responsibility of the landowner. The reserve along the river is managed by the Shire. Areas of UCL are the responsibility with DPLH, but subject to native title claim and no current active management body.
Hutt River Mouth to Little Bay	UCL and Freehold.	Freehold areas are the responsibility of the landowner. UCL are the responsibility with DPLH, but subject to native title claim and no current active management body.
Bowes River Mouth to Shire boundary	Freehold and narrow strip of UCL along beach.	Freehold areas are the responsibility of the landowner. UCL are the responsibility with DPLH, but subject to native title claim and no current active management body.

The historic settlement pattern has resulted in many private properties abutting the coast, leaving only a narrow strip of UCL along the beach. This applies in particular to the section of coast between White Cliffs and the southern boundary of the Shire. Public access to this part of the coast is available by driving north and south along the beach from either direction.

Preferably, changes in land tenure and vesting arrangements should be undertaken to accommodate the recommended level of development and management. However, this will require negotiations with landowners, vesting bodies and Aboriginal claim groups, and can be complex. It could also require an increase in funding and resources to allow appropriate management. Therefore, only minor changes to tenure are recommended.

## 10.3 EXISTING LAND USES

### RECREATIONAL USES

Unlike much of the broader coastal areas to the north and south of Geraldton which are fringed by on-shore reef platforms, the study area comprises mostly open beaches typically protected by a near-shore reef system. Accordingly, and as evidenced by community responses, the coast is a unique recreational resource highly valued by the local community. The absence of restrictions on the use of off-road vehicles along the entire section of coast is a major feature of the experience as it has in effect created an "outback" coastal experience in close proximity of a major urban centre. As a consequence, key locations along the coast are well used on weekends and major holidays for a range of water-based activities frequently also involving overnight camping on the beach.

The coastal environment provides the opportunity for a range of recreational activities including boating, fishing, surfing, windsurfing, diving, swimming and off-road vehicle

use. The lagoons are attractive for swimming, diving, water skiing and fishing. Boat access through nearshore reefs is restricted to random and often dangerous gaps. At river mouths there are breaks in both the rock platforms and the nearshore reefs, making the beach attractive for surfing and fishing, while the rivers provide for swimming and bird watching. Large mobile sand dunes are widespread and attract off-road vehicle use, particularly those north of Lucky Bay and Port Gregory.

Coastal land use is generally confined to recognised 'activity nodes'. This has the dual benefit of focussing infrastructure and management measures where they are most needed and releasing pressure on unmanaged parts of the coast. The nodes are placed in a hierarchy commensurate with existing and anticipated development pressures and the need for additional facilities. This hierarchy is listed below and is based on the hierarchy determined in the 2006 Strategy.

- Wagoie – Major Day Use Recreation Site
- Lucky Bay – Overnight Accommodation Site (modified from the 2006 Strategy which listed this site as Minor Day Use Recreation Site)
- Halfway Bay – Overnight Accommodation Site
- Sandalwood Bay – Coastal Recreation Node
- Port Gregory – Local Centre
- Hutt River Mouth – Minor Day Use Recreation Site (modified from the 2006 Strategy which listed this site as Major Day Use Recreation Site)
- Broken Anchor Bay – Coastal Recreation Node
- White Cliffs – Minor Day Use Recreation Site
- Woolawar Gully – Minor Day Use Recreation Site
- Oakabella Creek – Minor Day Use Recreation Site

## **CAMPING**

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Camping is a popular recreational pastime along the coast, and there are many locations within the Shire which are highly valued for this use. In the southern portion of the Shire, informal camping occurs amongst the dunes between Coronation Beach and Oakabella Creek, and in the vicinity of Woolawar Gully where the gully itself and adjoining terrain afford attractive and sheltered locations for overnight stays. Camping is also widespread between and in the vicinity of Halfway Bay and Lucky Bay. Though less common because of isolation, scattered campsites are also found amongst the swales and mobile sandsheets north from Lucky Bay to Wagoie Beach. These camping areas are described in more detail below.

**Table 10.2 – Land use at coastal sites**

Site	Level of Use	Facilities	Issues
Woolawar Gully	Low	None	Located on private property. Access is only available via the beach.
Oakabella Creek	Low	None	Located on private property. Access is only available via the beach.
Hutt River	Low	None	Located on private property.
Lucky Bay	High use during peak periods	Toilet facilities, Dump point, designated camping spots	Very high use during peak periods. Issues with rubbish
Wagoe	Low	None	Overflow camping from Lucky Bay during peak periods. Rubbish. Access only via the beach or by trespassing private property.

Camping is particularly popular during the Easter and Christmas breaks when an influx of visitors come to the coast to take their holidays. Camper numbers along the coastal stretch at Lucky Bay can reach a couple of hundred campers. Because of this, campers will travel further along the coast in order to find a more isolated spot. Issues associated with a high number of campers include:

- Rubbish
- Health risks – people disposing of human waste and food waste in sand dunes
- Destruction of vegetation to make space and for firewood
- Potential spread of diseases and weeds
- Bushfire risk
- Resource costs to the Shire and community to clean up after busy periods.

A low-key camping node has recently been formalised at Lucky Bay, just north of the Halfway Bay shacks. A caretaker residence has been established at Halfway Bay where the access track leads to Lucky Bay. The caretaker will take a small fee from campers and will help manage the area. The small fee will cover costs associated with cleaning and managing the area and for using the toilet amenities provided. Campers will still be permitted to camp elsewhere along the Lucky Bay area as long as they have their own toilets.

## COASTAL ACCOMMODATION

Formal camping and caravanning are accommodated in caravan parks at Horrocks and Port Gregory. These are used to capacity at peak times such as Christmas and Easter. A caravan park is located at Port Gregory which comprises sites for caravans and campers, as well as chalets and cabins. Caravan parks are also located at Horrocks.

Coastal shacks are located at Halfway Bay. Lease agreements were recently entered into between the Shire and the shack owners.

Wagoe chalets are located high on the dunes at Wagoe, situated at the northern end of the study area.

## COMMERCIAL OPERATORS

The Wagoe chalets and quad bike tours are located at the northern end of the study area. The quad bike tours operate through the dunes from Wagoe to Lucky Bay.

## LAND USE CONFLICTS

Land use conflicts occur when different land uses take place in close proximity to each other, causing dangers and safety issues, such as vehicles on beaches which are also popular for swimming and walking. In these situations it is best practise to separate conflicting activities to reduce safety risks (which can be assisted through the use of signage). While land use conflicts do not appear to be a significant issue a majority of the time, it can be an issue during peak periods when there is a huge influx of visitors. It is a particular problem at Port Gregory where vehicles access the beach to drive to locations and to launch boats, and where the beach is also used for swimming, walking and other beach activities. It is not considered necessary to implement land use zones in this location as there has not been an indication that these issues have been significant. One suggestion from community consultation is that education could assist in alleviating some of the issues associated with land use conflict, such as making people aware of other beach uses, the appropriate speed for vehicles and the location of suggested tracks for driving.

## TOURISM

Tourism to the Mid-West has remained popular over the last 10-15 years. An estimated 547,700 visitors were recorded in 2014/2015. Intrastate tourists represent 85% of the tourist market with Interstate representing 7% and international visitors representing 8%. The average length of stay was 5 nights. 16% of domestic visitors and 29% of international visitors stay in caravan parks or commercial camping grounds (Tourism WA, 2015).

The total number of visitors to Geraldton being 180,500 visitors was averaged per year for the period between 2011 – 2013. 9% of domestic visitors and 44% of international visitors stayed in a caravan park or commercial camping ground (Tourism WA, 2017).

Tourism WA supported the preparation of this document as they recognise that the Shire of Northampton contains significant coastal tourism destinations including Kalbarri,

Port Gregory and Horrocks which provide a mix of accommodation, attractions and amenities for visitors to Western Australia seeking to experience the coastal environment. They consider it important that the Strategy ensures that these tourism attributes are protected and maintained but also that provision is included to enable further development.

## 10.4 ACCESS

### VEHICLE ACCESS

It is evident from an examination of public and private land tenure that access to the coast can only be achieved legally at a few locations. Once such access is gained, vehicle movement along the beach is possible for much of the coast, although the absence, or narrowness, of the beach precludes this in some locations.

- Access from Wagoe to Lucky Bay is either along the beach or, in places, along a track which meanders through secondary dunes and swales behind the frontal dune. Tracks exit this into mobile sandsheets to the east and through the frontal dune onto the beach to the west.
- Between Sandalwood Bay and Lucky Bay there are a multitude of tracks, including two primary north-south routes, one on the eastern edge of UCL and the other leading through Halfway Bay to Lucky Bay.
- North of Port Gregory drivers use both the beach and tracks through the dunes. From Port Gregory to Hutt River, vehicles travel only along the beach.
- South of the Hutt River mouth, vehicles tend to stay on the beach but cannot travel far before being stopped by steep limestone cliffs which rise from the ocean edge.
- Between the Bowes River and Woolawar Gully there is a single track immediately behind the beach. This track, below the slope that rises to the limestone escarpment, provides a coastal link between the Bowes River mouth and Coronation Beach. It is duplicated between Woolawar Gully and Oakabella Creek, with one track behind the frontal dune and another winding along the face of the secondary dune.

Vehicle access throughout the study area is relatively limited, with only a few sites accessible via 2WD and a majority only accessible with 4WD. Port Gregory and Halfway Bay are accessible with 2WD. The remainder of the coast is only accessible with 4WD by driving along the beach or through the dunes.

It should be noted that 4WD access through the dunes should be confined to designated tracks and the creation of new or duplicate tracks should be avoided and managed. This is to protect vulnerable coastal environments and to minimise public safety risks. Off-road vehicle access is discussed further below.

## OFF-ROAD VEHICLES AND ROAD REGISTERED VEHICLES

There are two types of vehicles that drive on the beach, Road Registered Vehicles (RRV) and Off Road Vehicles (ORV). RRVs are licensed vehicles which have the ability to be used off road. ORVs are unlicensed vehicles which can be used off road (such as quad bikes, dune buggies etc.). The Control of Vehicles (Off Road Areas) Act 1978 applies to land owned by the State of WA and areas designated by Local Government Local Laws for off road vehicles (unregistered) only. Registered Road Vehicles are managed under the Road Traffic Act 1978 and Local Government Local Laws.

Environmental damage occurs when vehicles are driven over the dunes and through vegetation without following designated or existing tracks. This leads to erosion and dune blowouts. The issue is exacerbated when multiple tracks are created and drivers leave their tyres at full pressure. It is a significant challenge managing vehicle use within coastal areas, particularly when some drivers do the right thing while others can cause damage. Other issues include the spread of dieback, disturbance to heritage sites and safety risks where other beach users are present. It is important that tracks are rationalised, drivers are educated and vehicle tracks avoid Aboriginal cultural heritage sites and historic heritage places.

The NACC Feasibility Report (NACC, 2015) has considered options for the creation of Permitted ORV Areas in the broader region under the Control of Vehicles (Off Road Areas) Act 1978. The intention of these areas is to focus off-road driving to certain areas rather than allowing vehicles to drive anywhere along the coast. No formal ORV areas were proposed in the Shire of Northampton.

The use of ORVs throughout the study area has not been identified as a significant issue compared to other coastal areas in the state. Issues associated with this activity include:

- Multiple and new tracks created in some areas
- Soft sand conditions on the beach which can result in vehicles getting bogged
- Tide conditions change significantly and bogged vehicles can become submerged
- Safety conflicts along some beaches, particularly

during peak period, where swimmers and other beach users use the same area

- Vehicles driving at an inappropriate speed, especially in areas with other beach users
- Dune destruction caused when drivers don't let tyre pressure down

It is recommended that more driver education is undertaken regarding tidal differences, tyre pressure, sand conditions and safe speed.

## PEDESTRIAN ACCESS

There are limited formal pedestrian access paths within the study area (i.e. hard surfaces such as timber boardwalks or concrete). This is due to the low-key nature of the study area and the low relief of the sand dunes meaning that steps are not required. Timber steps are provided from the carpark to the vehicle access track at Port Gregory (although these are currently covered in sand).

## DISABLED ACCESS

The Shire of Northampton has an existing Disability Access and Inclusion Plan (2007). Disabled access can sometimes be difficult in coastal areas due to the natural topography and landform which can be too steep and dangerous to provide access. However, access can be possible in certain areas and with certain facilities and it is recommended that the Shire explore these options.

## BOAT LAUNCHING

There are no formal boating facilities within the entire study area, however boat users launch and retrieve small boats at various locations along the coast. The size of the boats able to be launched is limited to users who own 4WD vehicles.

Boats are launched from the beach at Port Gregory and Lucky Bay. Although locals are able to launch boats with considerable ease, it is more difficult for visitors and tourists. The 2006 Strategy recommended that a new boat launching ramp was constructed at the north-western beach access point at Port Gregory. This is not recommended as any fixed infrastructure in this location is vulnerable to erosion from storms during periods of retreat and accretion during periods of erosion.

## 10.5 FACILITIES

### PUBLIC TOILETS

Public toilets are important for public health reasons, particularly popular sites and areas where camping is permitted. In terms of the types of toilets which can be

provided this can vary depending on the demand, the soil types, water availability, Shire resources and initial costs. They can vary from simple toilets such as long-drop toilets to compost toilets and sewerated toilets. The provision of toilets should be carefully considered because they create an additional facility which needs to be appropriately managed and maintained.

Public toilets are provided at the Port Gregory car park. Toilets have also recently been installed at the Lucky Bay camping area.

### **PICNIC FACILITIES AND BARBECUES DAY USE SITES**

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A number of coastal nodes are used as day use sites, such as Wollawar Gully, Oakabella Creek, White Cliffs, Hutt River mouth and Wagoe. No facilities are provided at these locations.

The only site with day-use facilities is Port Gregory which has a barbeque and picnic benches at the car park adjacent to the beach.

### **RUBBISH AND WASTE**

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The only coastal sites which are serviced with rubbish bins is Port Gregory and the Halfway Bay shacks and Camping Nodes. The provision of rubbish bins helps to manage waste and reduces littering in the surrounding coastal environment.

Rubbish was identified as a major issue in the community survey, and is a significant issue during peak season when a huge influx of visitors visit the Shire's coastal areas. While a majority do the right thing and dispose of rubbish responsibly, there are a few that do not. Another significant issue is human waste left in the dunes from campers who do not have or use toilet facilities

The local community does a great deal to tidy and cleanup the coastal environment, particularly after peak season. This is appreciated by the Shire and other coastal managers. It is important that the community continues to be supported by the Shire and other land managers. The sense of ownership and immense value that the community places on the coastal environment should be encouraged and opportunities should be identified to further support the community.

### **SIGNAGE AND SAFETY**

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Signs provide a way to inform people about the location they are in and the interesting features of the area. They also provide a means of informing people about local dangers, rules and regulations and give directions. The

types of available signs can be categorised as follows:

- Name – identifying the location
- Risk –describing dangers at the beach e.g. rips, swells, cliff hazards, sharks
- Directional – to point directions to a beach, toilets, camp areas, barbeques etc.
- Rules – particularly for camp areas e.g. ground fires, camp fees, dogs, rubbish etc.
- Facilities – what facilities are provided at the site e.g. toilets, barbeques, campsites
- Recreational – what can this beach offer e.g. good for surfing, swimming, walking dogs etc.
- Interpretative – signage describing certain aspects of the area e.g. environmental, historical.

Due to the low-key nature of the coastal area, the number of signs is heavily reduced in comparison to high use sites elsewhere in the state. Signs are located at higher use sites such as Port Gregory and Halfway Bay, some have been erected by the Shire or State Government. Others are informal in nature and have been erected by locals.

Risks to visitor safety along coastal areas include rock falls, slippery rocks, rips, big swells, off-road vehicles and uneven steps or paths. It is important that landowners are aware of their obligation to manage coastal hazards and to implement preventative actions where appropriate such as the erection of signage and fencing off dangerous areas. Signage can be used to inform visitors of coastal hazards and risks and how to avoid them.

## **10.6 HERITAGE**

### **ABORIGINAL CULTURAL HERITAGE SITES**

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The Northampton area boasts significant natural resource assets that are of high cultural and environmental value to Aboriginal people. These values must be recognised and appreciated for the effective management of the country. The aspirations, issues and needs of indigenous people for managing sea and country need to be considered. These vary between cultural groups in accordance with traditional Aboriginal lore and custom. Therefore all of the groups must be effectively engaged in any works arising from this Strategy.

There have previously been four registered native title claims within the study area including the Hutt River, Naaguja Peoples and Amangu claim (represented by the YMAC) and the Mullewa-Wadjari claim. Recently, the claim boundaries have changed and the Hutt River Claim Group is now the only claim group in the study area.

A search was undertaken of the Aboriginal Heritage Directorate Aboriginal Heritage Site Search for Registered Heritage Sites, Other Heritage Sites and Heritage Surveys throughout the study area (DPLH, 2017). A number of heritage sites are located along the coast, many of which are associated with the coastal dunes and river systems. A summary is provided below.

**Table 10.3 – Registered Aboriginal Heritage Sites**

Site	Site ID	Site Type	Location
Wagoe Farm Burial	6750	Artefacts/Scatter, Midden/Scatter, Skeletal Material/Burial	Wagoe
Lucky Bay	4647	Artefacts/Scatter, Skeletal Material/Burial	Inland from Lucky Bay
Lynton Station	4491	Artefacts/Scatter, Skeletal Material/Burial	Hutt River
Graves	4732	Skeletal Material/Burial	Hutt River
Hutt River	5672	Painting	Hutt River
Taylors Farm Northampton	5556	Painting, camp	Inland from White Cliffs
Lynton Station	5557	Artefacts/scatter	Inland from White Cliffs
South Hutt Burial	17452	Artefacts/Scatter, Skeletal Material/Burial	Inland from White Cliffs
Woolawar Gully	5467	Artefacts/Scatter, Skeletal Material/Burial	Woolawar Gully
Northampton	5560	Skeletal Material/Burial	Inland from Oakabella Creek
Woods Farm Blowout	437	Artefacts/Scatter	Inland from Oakabella Creek
Woods Farm Painting	436	Painting	Inland from Oakabella Creek

**Table 10.4 – Other Heritage Sites**

Site	Site ID	Site Type	Location
Balline 1	29011	Artefacts/Scatter, Arch Deposit	Lucky Bay
Balline 2	29012	Artefacts/Scatter, Arch Deposit, Shell	Lucky Bay
Balline Isolated Artefacts	29013	Other: 6 Isolated artefacts	Lucky Bay
Utcha Well	1028	Artefacts/Scatter	Port Gregory
Gill Hill	1027	Artefacts/Scatter	White Cliffs
Errinringy Pool	4790	Artefacts/Scatter	White Cliffs
Port Gregory Road Burial	17462	Skeletal Material/Burial	White Cliffs
Horrocks Midden	18433	Artefacts/Scatter, Midden/Scatter, Ochre	White Cliffs
Horrocks-Northampton Road	17464	Skeletal Material/Burial	South of Bowes River Mouth
Coronation Beach Area	15859	Camping/Hunting Place	South of Oakabella Creek

It is also noted that the study area is subject to Native Title claims. It will be necessary to consult with relevant Native Title claim groups and their representative body (YMAC) to ensure appropriate consideration is given to the rights and interests of Traditional Owners, including heritage matters. Compliance with the procedural obligations of the Native Title Act 1993 (Cth) at all times shall be required.

Land use or development that may impact upon a heritage site is required to obtain the consent of the Minister under section 18 of the Aboriginal Heritage Act 1972. The Section 18 process involves giving notice to the Aboriginal Cultural Material Committee (ACMC) accompanied by the information as to the intended use of the land and Sites on the land. The Aboriginal Heritage Directorate recommends that developers undertaking activities within the study area take into consideration the DPLH’s Aboriginal Heritage Due Diligence Guidelines when planning. The guidelines have been developed to assist proponents to identify any risks to Aboriginal heritage and to mitigate risks where heritage sites may be present. Due diligence may involve one or more of the following actions:

- assessing the landscape where an activity is to take place
- assessing the proposed activity and the potential impact on the landscape
- searching the Register of Aboriginal Sites and the Aboriginal Heritage Inquiry System
- consulting with the relevant Aboriginal people
- agreeing to an Aboriginal heritage survey
- other heritage management strategies.

### HISTORIC HERITAGE PLACES

A search of the Heritage Places database was undertaken and the results are listed in the table below (DPLH, 2017). Some are outside of the study area but located in close proximity to coastal sites (such as the Lynton convict hiring depot, pensioner guard cottages and the lime kiln and quarry).

**Table 10.5 – Historic Heritage Places**

Site Name	ID	Description	Listing
Lime Kiln and Quarry	08918	The lime kiln & quarry is believed to have been used in the construction of the various buildings which made up the Lynton Hiring Depot (Site No. 25), Sanford's House (Site No. 26) and the Pensioner Guards Cottages (Site No. 27). The lime kiln is mentioned in the inspection report of April 1854.	Municipal Inventory – Category 4A

Site Name	ID	Description	Listing
Pensioner Guard Cottages (Ruins)	08917	Accompanying the ticket-of-leave men to the Lynton Hiring Station (Site No. 25) were 9 Pensioner Guards, mainly from the Crimean War and the Indian Mutiny. Some of the Pensioner Guards sent for their wives and families to join them. Adjoining the Lynton townsite there was to be a Pensioner Village for locating each of the Enrolled Pensioner Guards at the Lynton Hiring Depot on three acres of good land. Several stone cottages are said to have been built to house the guards and their families.	Municipal Inventory – Category 4A
Hutt Lagoon	17837	Salt mining was carried out in this locality.	Municipal Inventory
Port Gregory Townsite	08916	Small coastal fishing / holiday town near the mouth of the Hutt River. Town comprises several streets, some with holiday houses and others with permanent residents. There is also a caravan park, general store and some recreation facilities. Port Street finishes at the coast overlooking a small bay or anchorage surrounded by reefs which act as a breakwater. A timber jetty projects out into the anchorage for servicing fishing and pleasure boats.	Municipal Inventory – Category 4A
Kirtons Group	03776	The place contains substantial evidence of the early and later phases of its mining history and is highly significant at the local level.	Municipal Inventory – Category 2
Lynton Convict Hiring Depot (Ruins)	01915	Lynton Convict Hiring Depot is an important example of convict hiring depots in Western Australia. It demonstrates the role of ticket-of-leave men and how they were organised as part of the penal system.	State Register Municipal Inventory – Category 1A
Yallabatharra School - site	17834	The site of the Yallabatharra School has historic significance as evidence of the development of the Northampton district. Combined with the other school sites, this place reveals the effect of centralisation of education as well as the changing settlement patterns of the area.	Municipal Inventory – Category 4A
Oakabella Homestead	03271	Oakabella, comprising: homestead and associated walled garden and trees; a kitchen and quarters; two storey barn; blacksmith's shop (ruin); stables; shearing shed; and two framed houses with various modern light-framed shelter structures.	State Register Municipal Inventory – Category 1A

## 10.7 COMMUNITY INVOLVEMENT

### COASTAL EDUCATION AND AWARENESS

Community involvement in coastal issues and management is beneficial as it creates a sense of ownership and helps to achieve better management outcomes. The Shire should work with other coastal land managers and adjoining landowners to support and encourage involvement of

landowners and the community. Involvement of the wider community can also help to increase community knowledge of the coastal environment, and achieve community level behavioural change, which can result in increased care for the environment and a reduction in harmful activities.

While a majority of the study area is relatively remote, it is regularly used by nearby communities and tourists, even residents as far as Geraldton which is only approximately one hour drive away. The City of Greater Geraldton has banned the use of off-road driving on sections of their beaches which has meant that this user group has had to look outside the City of Greater Geraldton for areas to drive.

Options that may assist in raising public awareness of coastal issues include:

- Driver/Coastal Education Program – including visitor safety, sustainable coastal use and off-road safety. Include information on vehicle use within coastal areas (refer to the South Coast NRM code of conduct manual and any other user group codes i.e. Trail Bike Riders) and educate vehicle drivers on the Control of Vehicles (Off-Road Areas) Act 1978 and how it is applicable to the coastal areas of the Shire. Ensure that associated resources (such as tourist brochures and maps with warnings about coastal hazards) are available and accessible to the public (available at popular tourist locations, shops, information centres, accommodation and businesses).
- Coastal Community Support Program – encourage and support voluntary individuals and groups who manage coastal areas.
- Coastal Training Programs – run short courses on coastal management through training organisations to educate a number of interested people on coastal issues and management.

## COASTAL RESEARCH

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Increasing the information base on the coastal environment will be beneficial in determining the scale of impact and what should be done to manage the coast. The information which can be gathered includes visitor numbers, activities undertaken and nights staying/camping along the coast. More information can be gathered over time as more studies are conducted and monitoring and research is undertaken.

The demographics of people visiting coastal nodes is important in order to determine the scale of use and how much management is required to reduce impacts. The Shire can monitor visitor numbers at Lucky Bay through registrations, camp fees and from observations by the caretaker. It could also be beneficial to survey these users to determine their expectations and experiences. This

will also help the Shire and other land managers to plan for expected visitor numbers, to provide the appropriate facilities and make appropriate decisions regarding management of coastal sites.

# 11.0

# BIBLIOGRAPHY

AECOM Australia Pty Ltd and Batavia Regional Organisation of Councils, (2010), Climate Change Adaptation Action Plan, Batavia Regional Organisation of Councils, WA.

Australia ICOMOS Incorporated, (2013), The Burra Charter The Australia ICOMOS Charter for Places of Cultural Significance, Australia ICOMOS Incorporated, VIC.

Batavia Coast Coastal Planning Group and Landvision, (2001), Batavia Coast Strategy, Ministry for Planning, WA.

Bruch, J., and Freeman, M.J. (2017), Migration of limesand dunes in Western Australia and their impacts, Department of Mines and Petroleum, Perth, WA.

Bureau of Meteorology, (2017), Climate Data Online, From <http://www.bom.gov.au/climate/data/index.shtml?bookmark=200>

Caring for Our Country, Weed Management Guide, Weed of National Significance, African Boxthorn.

Department of Agriculture and Food (DAFWA), (2017), Natural Resource Management – Shared Land Information Platform, From <https://www.agric.wa.gov.au/resource-assessment/nrinfo-western-australia>

Department of Aboriginal Affairs and Department of Premier and Cabinet, (2013), Aboriginal Heritage Due Diligence Guidelines, WA.

Department of Planning, Lands and Heritage, (2017), Aboriginal Heritage Inquiry System, From website <https://www.daa.wa.gov.au/heritage/place-search/>

Department of Planning and Ecoscape, (2010), Geraldton Regional Flora and Vegetation Study, Western Australian Planning Commission, WA.

Department of the Environment, (2015), Wildlife Conservation Plan for Migratory Shorebirds, Commonwealth of Australia.

Eliot I, Gozzard JR, Eliot M, Stul T and McCormack G. (2012) The Coast of the Shires of Coorow to Northampton, Mid West, Western Australia: Geology, Geomorphology and Vulnerability, WAPC, Perth, WA

En Health Environmental Health Standing Committee (2012), Risky business – a resource to help local governments manage environmental health risks, Australian Government Department of Health and Ageing, Canberra.

Evolve Solutions (2014), Mid West Tourism Development Strategy, Mid West Development Commission and Regional Development Australia, WA.

Greenskills, (2010), Coastal Management Specification Manual, South Coast Management Group and DPLH, WA.

Heritage Council of Western Australia, (2017), Sites Register, From <http://www.stateheritage.wa.gov.au/>

Land Insights and Shire of Chapman Valley (2016), Shire of Chapman Valley Coastal Management Strategy and Action Plan, Shire of Chapman Valley, WA.

Life Saving Victoria, (2006), National Aquatic and Recreational Signage Style Manual, Life Saving Victoria, VIC.

Northern Agricultural Catchments Council, Regional Management Plan Control of African Boxthorn *Lycium ferocissimum*, Northern Agricultural Catchments Council, WA.

Pretzel S, (2015), Off-Road Vehicle Areas in the Northern Agricultural Region of Western Australia Feasibility Study a report by Trail Bike Management Australia to the Northern Agricultural Catchments Council, Northern Agricultural Catchments Council, WA.

R & E O'Connor Pty Ptd, (2015), Aboriginal Heritage Study of the Three Coastal Nodes in the Shires of Northampton, Irwin and Dandaragan, Shire of Irwin, WA.

Rodrigues and Anderson, (2006), Pakington Whaling Station, <https://www.yumpu.com/en/document/view/17995289/no-214-pakington-whaling-station-by-j-rodrigues-and-r-6>

Shire of Northampton, (2006), Shire of Northampton Coastal Strategy, Shire of Northampton, WA.

Shire of Northampton, (2009), Local Planning Strategy, Shire of Northampton, WA.

Shire of Northampton, (2012), Shire of Northampton Local Planning Scheme No. 10, Shire of Northampton, WA.

Shire of Northampton (2016), Community Strategic Plan 2016 – 2026, Shire of Northampton, WA.

Shire of Northampton (2016), Lucky Bay Coastal Nodes Project, Shire of Northampton, WA.

Shire of Northampton, Delegation Register and Policy Manual, Shire of Northampton, WA.

Shire of Northampton (2007), Disability Access and Inclusion Plan, Shire of Northampton, WA.

- South Coast Natural Resource Management Group, (2009), Proceedings of the Regional Forum: Vehicles in the Coastal Zone, South Coast Natural Resource Management Group, WA.
- South Coast Natural Resource Management Group, (2010), Managing Phythophthora cinnamoni for Biodiversity Conservation in the South Coast NRM Region of Australia, South Coast Natural Resource Management Group, WA.
- South Coast Management Group, (2012) South Coast Vehicle Working Group Discussion Paper, South Coast Management Group, WA.
- Standing Council on Energy and Resources, (2013), Multiple Land Use Framework, Standing Council on Energy and Resources.
- Stul T, Gozzard JR, Eliot IG and Eliot MJ (2014) Coastal Sediment Cells for the Northampton Region between Glenfield Beach and the Murchison River, Western Australia, Department of Transport, Fremantle.
- Surf Life Saving Australia, (2007), Australian Coastal Public Safety Guidelines 1st Edition, Surf Life Saving Australia, WA.
- Tourism WA, (2012), A Strategic Approach to Caravan and Camping Tourism in Western Australia, Tourism WA, WA.
- Tourism WA, (2014), Tourism Planning Guidelines, A Guide to Preparing the Tourism Component of a Local Planning Strategy in Western Australia, Tourism WA and DPLH, WA.
- Tourism WA, (2015), Mid West Development Commission Area Overnight Visitor Fact Sheet 2014/2015, Tourism WA, WA.
- Tourism Research Australia, (2016), From [http://tra.gov.au/Tourism\\_in\\_Local\\_Government\\_Areas\\_2016/LGA\\_Profiles/index.html](http://tra.gov.au/Tourism_in_Local_Government_Areas_2016/LGA_Profiles/index.html)
- Tourism WA, (2017), From <http://www.tourism.wa.gov.au/Research-Reports/Facts-Profiles/Pages/Development-Fact-Sheets.aspx>
- Western Australian Government, (2003a), State Planning Policy No. 2 Environment and Natural Resource Policy, Western Australian Planning Commission, Perth
- Western Australian Planning Commission, (2003b), Coastal Planning and Management Manual, Western Australian Planning Commission, WA.
- Western Australian Planning Commission, (2007), Visual Landscape Planning in WA: A Manual for Evaluation, Assessment, Siting and Design, Western Australian Planning Commission, Perth.
- Western Australian Planning Commission, (2007), State Planning Policy No. 3.5 Historic Heritage Conservation, Western Australian Planning Commission, WA
- Western Australian Planning Commission, (2010), Sea Level Change in Western Australia – Application to Coastal Planning, WAPC, WA.
- Western Australian Planning Commission, (2012), Status of Coastal Planning in Western Australia, Western Australian Planning Commission, WA
- Western Australian Planning Commission, (2013a), State Planning Policy No. 2.6 State Coastal Planning Policy, Western Australian Planning Commission, WA
- Western Australian Planning Commission, (2013b), State Planning Policy No. 2.6 State Coastal Planning Policy Guidelines, Western Australian Planning Commission, WA
- Western Australian Planning Commission (2014), Coastal Hazard Risk Management and Adaptation Planning (CHRMAP) Guidelines, Western Australian Planning Commission, WA
- Western Australian Planning Commission (2015), Mid West Regional Planning and Infrastructure Framework, Western Australian Planning Commission, WA

# **APPENDIX A**

## **Landform and Vulnerability Mapping**

# Legend

## Compartment and sediment cell boundaries

- ✦ Primary compartment
- ✦ Secondary compartment
- ✦ Tertiary compartment

## Cell number

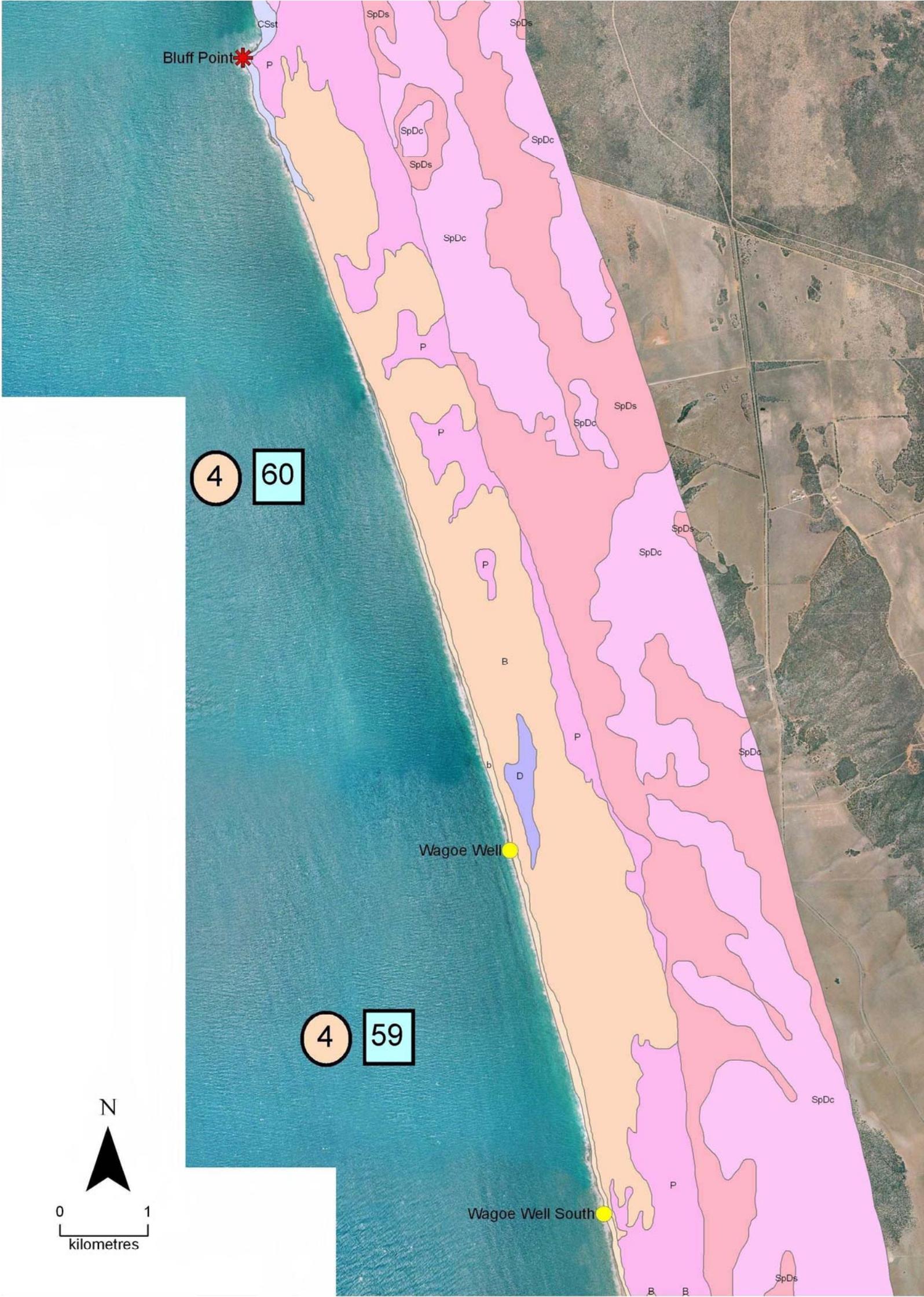
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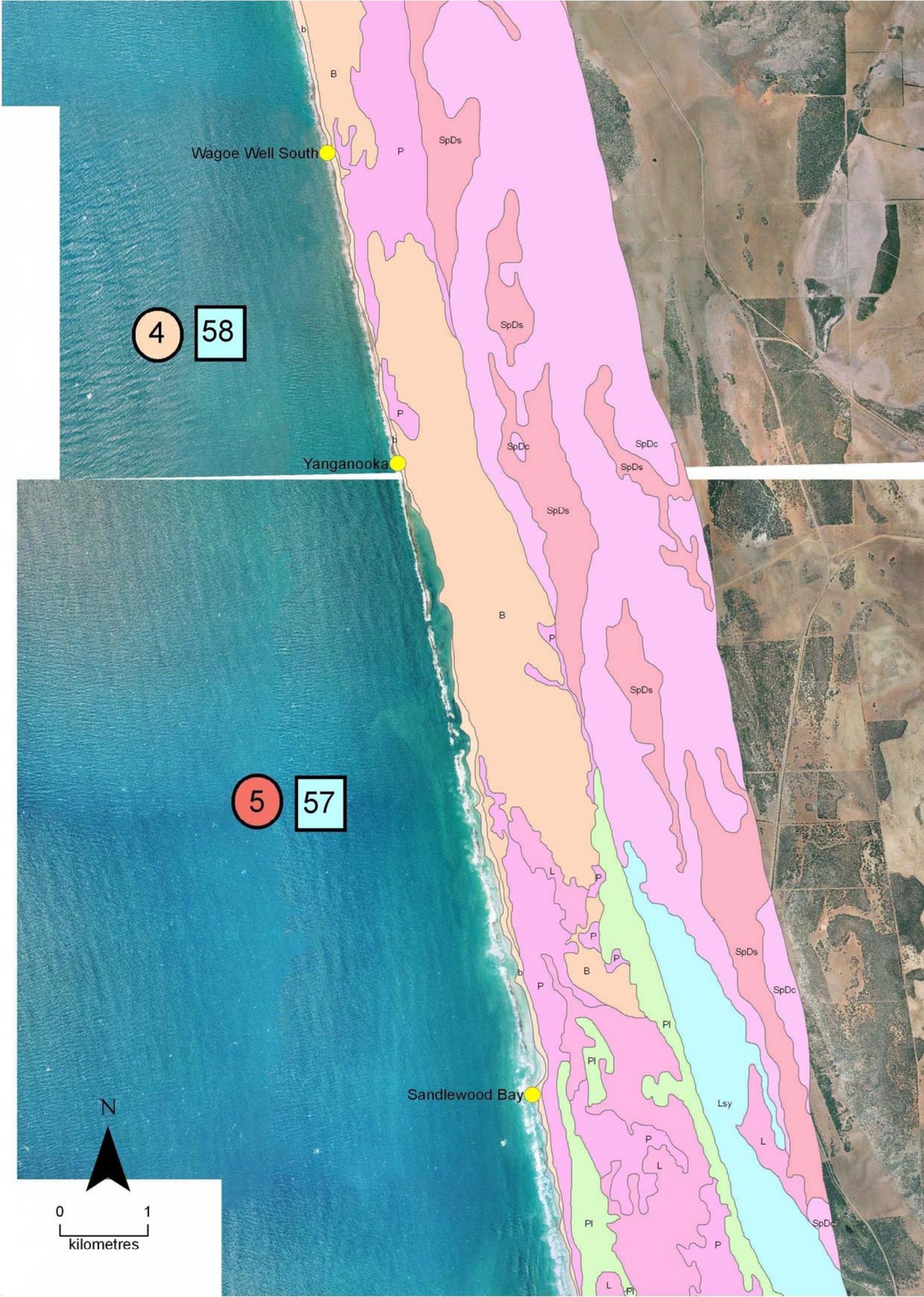
## Landform vulnerability

- 1 Low
- 2 Low to moderate
- 3 Moderate
- 4 Moderate to high
- 5 High

## Coastal geomorphology

Made	Made ground	Cfs	Cliff-foot slope
W	Water	Csf	Colluvial footslopes
b	Beach	Csg	Colluvial slopes, lateritic sands and gravels
F	Foredunes	Css	Colluvial slopes, sand
Fp	Foredune plain	Cst	Talus slope
B	Active parabolic dune lobes and blowouts, Quindalup Dunes	SpDc	Barrier complex, Spearwood Dune System calcarenite
P	Parabolic and nested parabolic dune complexes, Quindalup Dunes	SpDcc1	Cliffs, Spearwood Dune System
Pd1	Older dunes, Quindalup Dunes	SpDcc2	Degraded scarps and cliffs, Spearwood Dune System
Pd2	Older deflated dunes, Quindalup Dunes	SpDs	Barrier complex, Spearwood Dune System sand
PI	Long-walled parabolic dunes, Quindalup Dunes	CSst	Cliffs, Tumblagooda Sandstone
D	Deflation basins	ScSst	Scarp, Cattamarra Coal Measures
DI	Deflation basins, calcarenite floor	HsC	Hills and slopes, Toolonga Calcilutite
A	Alluvial flats	HsNCg	Hills and slopes, Northampton Complex
Ac	Alluvial channel	HsR	Hills and slopes, Windalia Radiolarite
Af	Alluvial fan	HsSst	Hills and slopes, Tumblagooda Sandstone
At	Alluvial terrace	HsZ	Hills and slopes, Kockatea Shale and siltstone
Av	Valley flats	Ps	Planation surface, lateritic duricrust
E	Estuarine flats	S	Sandplain
L	Lacustrine flats	G	Gravel plain
Lsy	Lagoons and swamps, younger	PC	Plateau, calcrete
Lso	Lagoons and swamps, older	PWR	Plateau, Windalia Radiolarite





Wagoe Well South

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Yanganooka

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Sandlewood Bay

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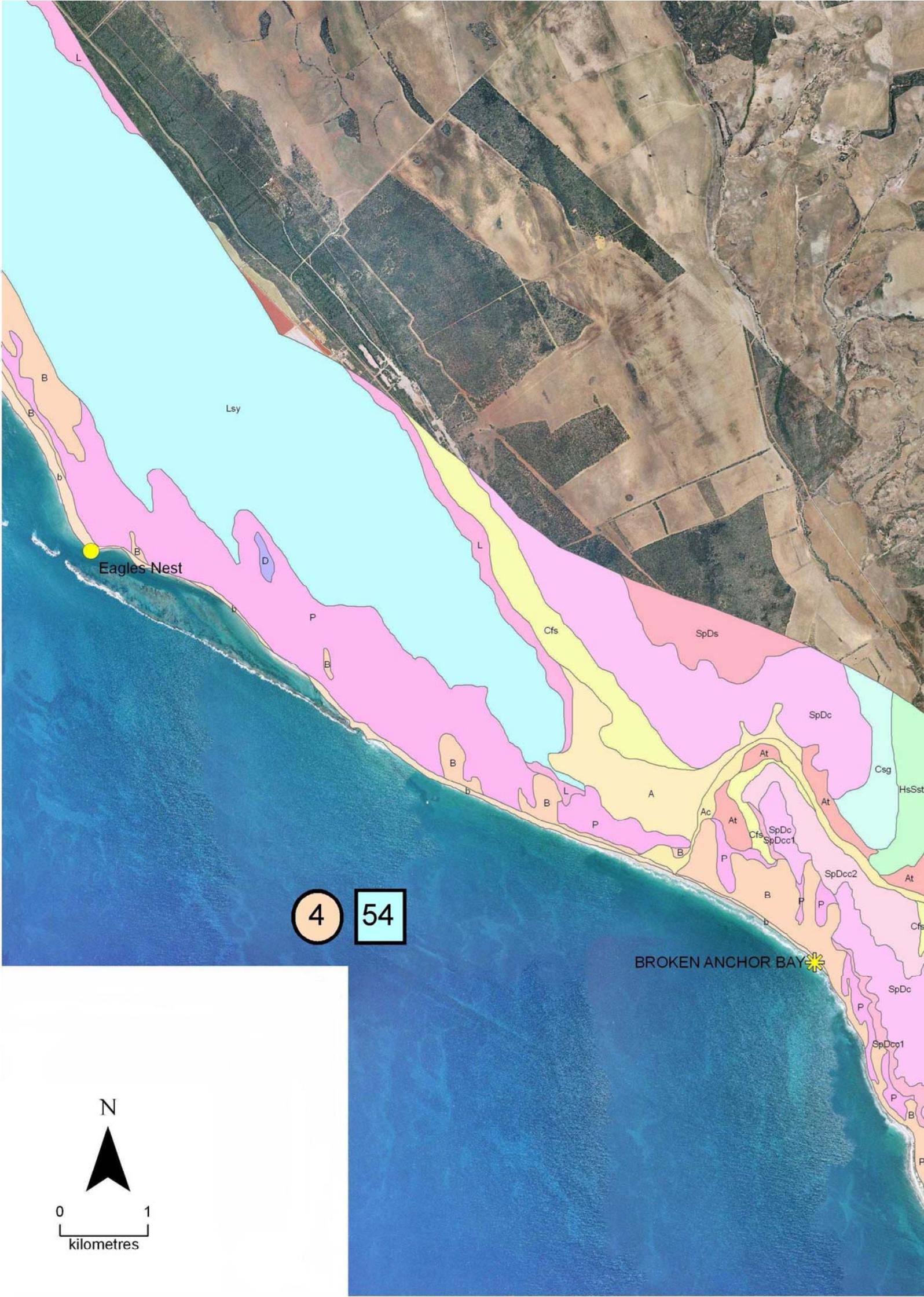
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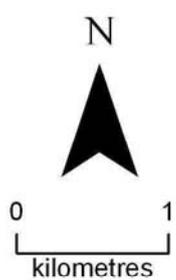
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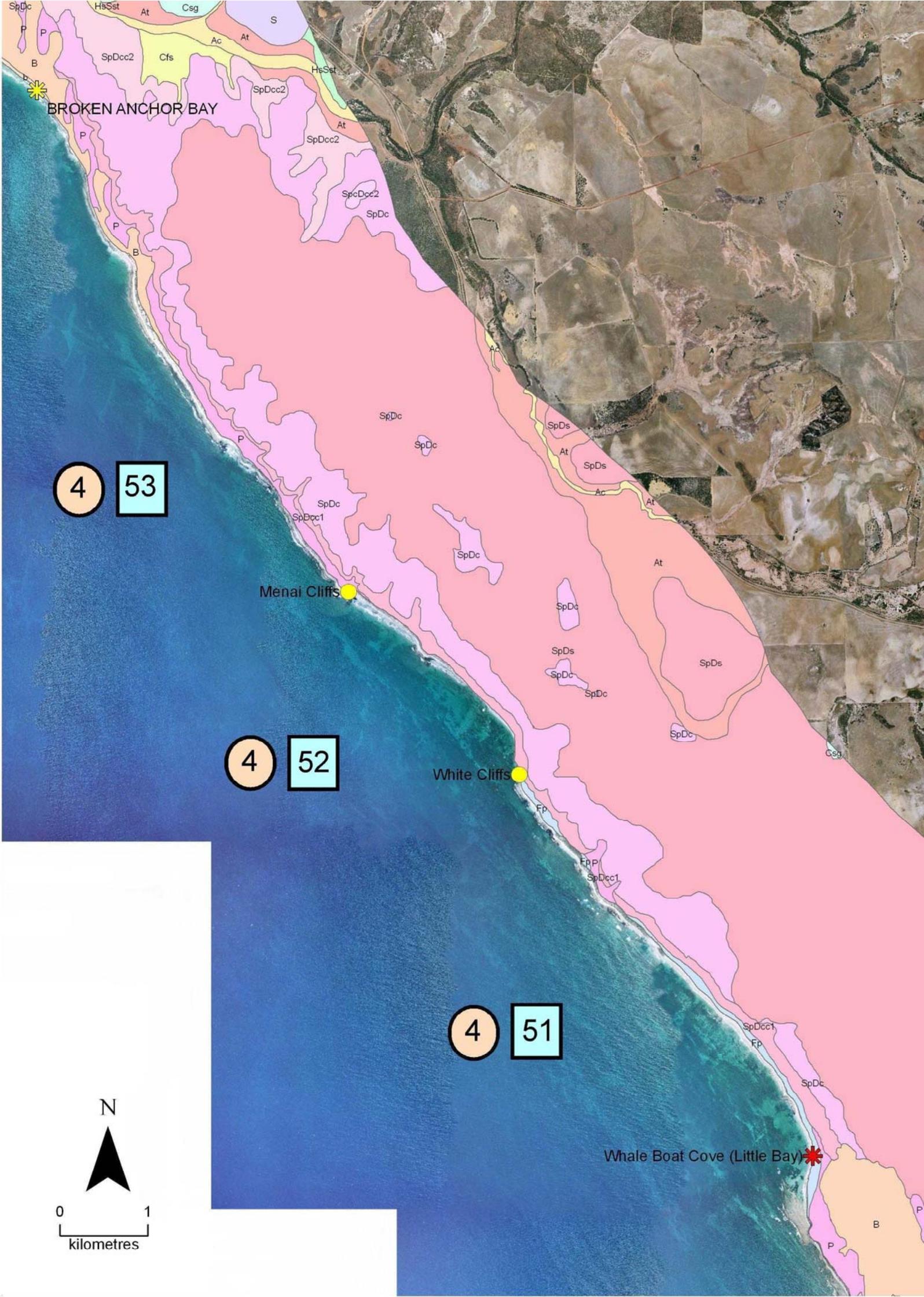


Eagles Nest

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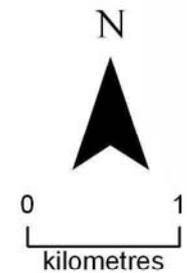
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