

# Preston Beach

## Foreshore Management Plan

Waroona Shire Council

31 August 2021





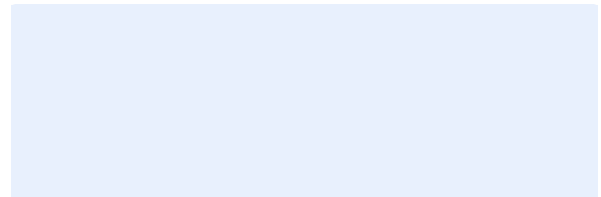
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## EXECUTIVE SUMMARY

The Shire of Waroona (SoW) coastal zone is an important social, environmental, and economic asset for the region. The SoW coastline is approximately 15 km long and extends from the northern boundary with the City of Mandurah to the southern boundary with the Shire of Harvey. It contains iconic sandy beaches and foredunes, and areas of significant social and recreational amenity for both residents and visitors alike. The risks associated with coastal erosion and inundation will increase over the coming decades due to sea level rise and other climate change impacts. In addition to these natural hazards, the foreshore is also exposed to the pressures associated with recreational uses.

To effectively manage these pressures, the SoW in conjunction with the Preston Beach Progress Association engaged Water Technology to develop an updated Foreshore Management Plan (FMP) for the area. The aim of the FMP is to set a 10-year strategy for the coordinated management of the SoW coastal foreshore. The FMP seeks to identify coastal management issues, pressures, risks, and opportunities - and the actions required to address these issues in a strategic and integrated manner. The Scope of Work for the development of the FMP comprised the following elements:

- A site inspection, and liaison with the SoW staff and project stakeholders
- Review of the existing 2002 Foreshore Management Plan
- Review of the prevailing coastal processes, ecological environment and processes and recreational usage.
- Assessment of coastal erosion and inundation hazards
- Assessment of the recreational amenity and community uses
- An overview of existing coastal land use and tenure
- Development of an FMP that provides a staged program of management actions for the foreshore through to 2030.
- Consultation with the local community and project stakeholders during the development of the plan, through the development of a Stakeholder Engagement Strategy.

The calculated erosion hazard in the vicinity of the car park and Preston townsite in 2030 has relatively low impact. Except for vehicle access ways and sand dunes, no other coastal assets are found located within the predicted erosion hazard zone. Assessment has also shown very minimal inundation risk in the next 10 years. The primary risk could be storm water runup through the vehicle access tracks and into the current green waste disposal site / car park. The nature of severe storms means inundation of these areas is likely to be very short-lived – associated with the peak of a storm (minutes to hours) or even individual waves.

A Community and Stakeholder Engagement Plan was prepared to identify relevant stakeholders and the structure and pathways for their engagement in accordance with the International Association of Public Participation (IAP2) Spectrum of Public Participation. A community workshop and survey were undertaken to understand the local community's values, and their perceptions of the key issues. A drop-in session was undertaken to obtain feedback on the Draft FMP.

The results of the survey, in combination with the outputs from the workshop have informed the prioritisation of recommendations for the foreshore at the end of this document. The primary concerns from the community related to antisocial behaviour by four-wheel drivers on the beach; misuse and maintenance issues associated with the ablutions block and car park amenities; and a desire for improved pedestrian access to appreciate the beach and coastal environment for people living with a disability and frail/elderly community members.

As part of the scope of works, the feasibility of the establishment of a caravan park at Preston Beach was considered, with reference to land parcel R32010. The erosion and inundation hazard risk assessment found



land parcel R32010 is unlikely to be subject to erosion for several decades. Depending on how the shoreline responds in coming decades, occasional inundation could impact the parcel sooner. These erosion and inundation risks are of no particular concern because the shape and location of the land parcel means the most accessible and suitable area for a caravan park is in the northeast corner (relatively flat, least risk of coastal hazards) – landward of the car park and amenities. This means any erosion or inundation risk would need to be addressed for these assets initially anyway before the caravan park. Following review of the details, it is considered that the site is not overly suitable for establishment of a caravan park and that other sites around town should be considered.

A summary of recommended management actions for the foreshore is provided for the study area. Indicative timeframes for implementing the actions are provided, along with suggested prioritisation (high, medium, low). Concept cost estimates for budgeting purposes are also provided.



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# 1 INTRODUCTION

## 1.1 Background

The Shire of Waroona (SoW) coastal zone is an important social, environmental, and economic asset for the region. It contains iconic sandy beaches and foredunes, and areas of significant social and recreational amenity for both residents and visitors alike (Figure 1-1). Preston Beach townsite is also home to a passionate local community, who are heavily invested in the utility and management of the foreshore.

The SoW foreshore is directly exposed to ocean swells, and periodically experiences coastal erosion and inundation. It is likely that the risks associated with these hazards will increase over the coming decades due to sea level rise and other climate change impacts.

In addition to these natural hazards, the foreshore is also exposed to the pressures associated with recreational uses. Owing to the Coastal Lakelands to the east of the dunes, the SoW foreshore is not easily accessible to the broader population, and Preston Beach is the only coastal town with full access to the foreshore in between Dawesville in the City of Mandurah and Myalup in the Shire of Harvey. Preston Beach is therefore a highly popular destination for recreational activities including swimming, fishing, and four-wheel-driving (4WD) beach recreation.

To effectively manage these pressures, the SoW in conjunction with the Preston Beach Progress Association has determined to develop an updated Foreshore Management Plan (FMP) for the area. The previous plan dates to 2002 and required an update to be consistent with the current state government coastal management and adaptation planning frameworks, including the latest climate change projections. This updated plan builds on the 2002 FMP whilst ensuring the SoW has a well-defined and holistic vision for the foreshore's management for at least the next 10 years.

A project Steering Committee was established to oversee preparation and completion of the FMP, including review of project deliverables. The Steering Committee played an advisory role in the project and consists of representatives from:

- Shire of Waroona
- Preston Beach Progress Association
- The Peron Naturaliste Partnership (including the adjacent Councils of Shire of Murray and Shire of Harvey)
- Department of Biodiversity, Conservation and Attractions
- Department of Planning, Lands and Heritage.

## 1.2 Aim and Objectives

The aim of the FMP is to set a 10-year strategy for the coordinated management of the SoW coastal foreshore. The FMP seeks to identify coastal management issues, pressures, risks, and opportunities - and the actions required to address these issues in a strategic and integrated manner.

A suite of objectives has been developed for the FMP, to ensure that the outcomes of the FMP are consistent with the principles of ecologically sustainable development for the social, cultural, and economic well-being of the SoW coast. The objectives of the FMP are:

- To identify existing and potential future risks from coastal hazards
- To protect and enhance the integrity and resilience of the environmental values of the study area for current and future generations.



- To support the social and cultural values of the foreshore and maintain public access and recreational amenity.
- To acknowledge Aboriginal peoples' spiritual connection to the study area and to protect local indigenous cultural heritage.
- To recognise the SoW coast as a vital economic resource for the region; and
- To maintain meaningful engagement with the community, and to support public participation in coastal management and planning, and to foster greater public awareness, education and understanding of coastal processes and management actions.

The Scope of Work for the development of the FMP comprised the following elements:

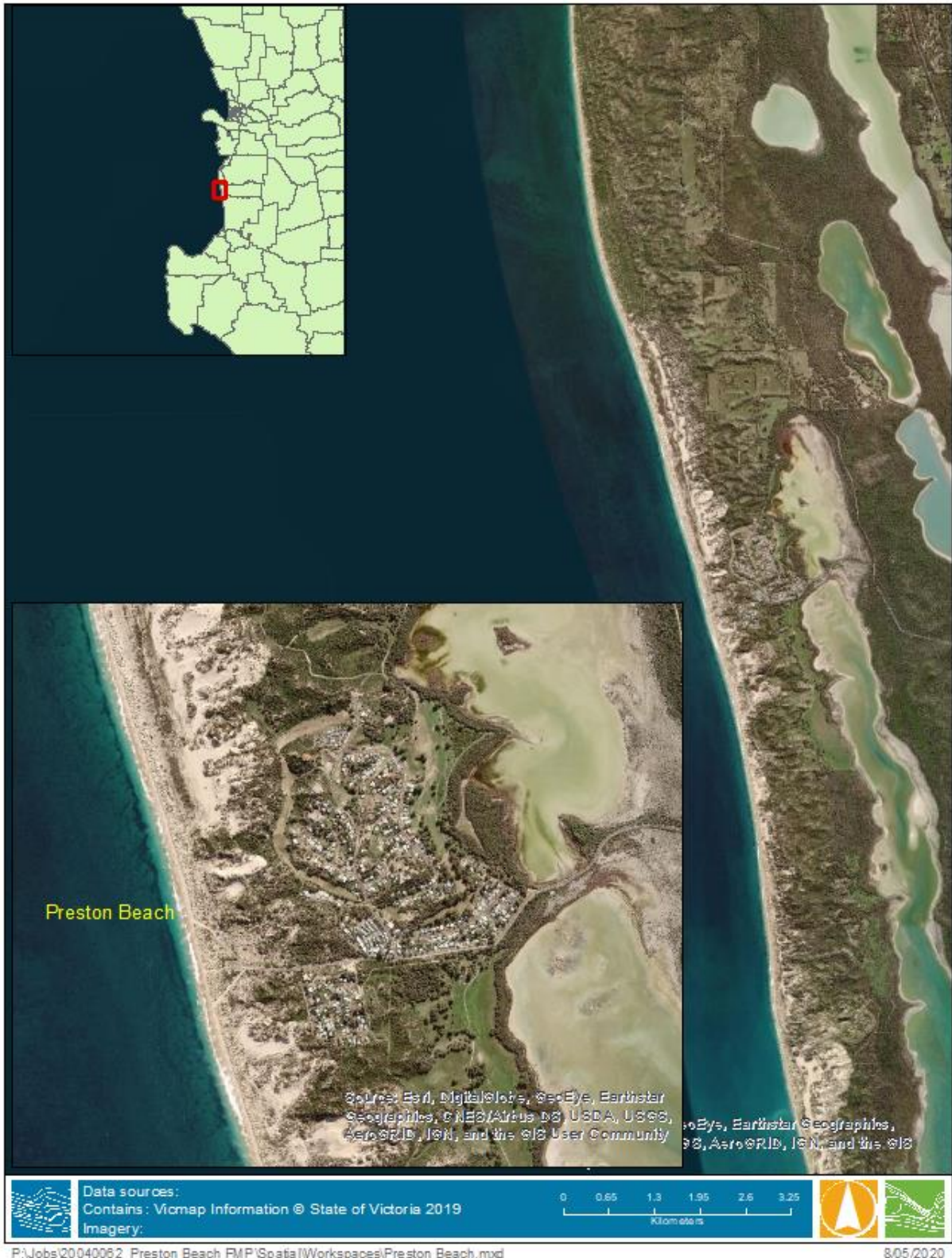
- A site inspection, and liaison with the SoW staff and project stakeholders
- Review of the existing 2002 Foreshore Management Plan
- Preparation of a summary of the strategic context for the FMP, including the prevailing coastal processes (tides, waves, winds, and sediment transport pathways), ecological processes (local flora and fauna) and recreational usage.
- Assess the recreational amenity and community uses, identifying issues such as access, public safety and projected future usage associated with local and regional population change.
- An overview of existing coastal land use and tenure
- Development of an FMP that provides a staged program of management actions for the foreshore through to 2030.
- Consultation with the local community and project stakeholders during the development of the plan, through the development of a Stakeholder Engagement Strategy.

### 1.3 Study Area

The SoW coastline is approximately 15 km long and extends from the northern boundary with the City of Mandurah to the southern boundary with the Shire of Harvey (Figure 1-1). The coastline across the LGA largely comprises:

- Undeveloped coastal reserves managed by the SoW, including R41776, R32010, R33345 and R25659
- Yalgorup National Park managed by the Department of Biodiversity, Conservation and Attractions (DBCA)

The study area is technically bounded by the low water mark to the west, and to the landwards extent of the coastal reserves to the east. The study area includes Preston Beach townsite, which contains a small permanent population of around 220 people (ABS, 2016).



**FIGURE 1-1 STUDY AREA AND LOCALITY PLAN**

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## 1.4 Site Inspection

A site inspection was undertaken at project inception on the 17<sup>th</sup> June 2020 to assess the local coastal processes and environmental values. Water Technology (WT) coastal engineers inspected both northern and southern extents of Preston Beach, as well as the car park, the inter-dune swale (between the primary and foredunes), the green waste disposal site, access road, beach access tracks, pedestrian access track and the coastal lookout point.



At the time of inspection, it was observed that the site was still experiencing energetic wave activity and strong wind gusts associated with the passage of a low-pressure system/cold-front. Waves of around one metre in height were observed at the shoreline, with wave breaking visible at both the shoreline as well as at nearshore sandbars. Despite these energetic weather conditions there was almost no evidence of significant beach erosion (often present in the form of large erosion scarps at the back of the beach). The beach condition was largely homogenous for approximately 1km either side of the swimming beach. The two vehicle access tracks are potentially vulnerable sites for storm inundation and subsequent erosion in severe storm events. The outcomes of site inspection are summarised in Table 1-1.

**TABLE 1-1 SITE INSPECTION OUTCOMES**

Location	Photos	Comments
Southern Beach (about 1 km south of townsite)		<ul style="list-style-type: none"> <li>■ Low but well maintained foredune with consistent vegetation.</li> <li>■ Little evidence of erosion scarps (~20cm) associated with severe storms in May and June 2020.</li> <li>■ Cuspate beach berm features evident in swash zone with wavelength approximately 40m.</li> <li>■ Wide depression behind foredune ~200 m width until primary dune – significant feature for this stretch of coast.</li> <li>■ Clear evidence of foredune brushing program.</li> <li>■ Well maintained vehicle access tracks to beach</li> <li>■ Evidence of tyres near the vehicle access being mobilised by storms</li> </ul>




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Location	Photos	Comments
<p>Swimming Beach (between two vehicle access tracks)</p>		<ul style="list-style-type: none"> <li>■ Low but well maintained foredune with consistent vegetation. No evidence of erosion scarps from severe storms in May and June 2020, but recent storm wave runup appears to have reached vehicle and pedestrian paths.</li> <li>■ Well maintained pedestrian track to swimming beach</li> <li>■ Recently established CoastSnap photo monitoring station</li> </ul>
<p>North Beach (about 1 km north of townsite)</p>		<ul style="list-style-type: none"> <li>■ Low but well maintained foredune with consistent vegetation.</li> <li>■ No sign of erosion scarps associated with severe storms in May and June 2020.</li> <li>■ Cuspate beach berm features evident in swash zone with wavelength approximately 40m.</li> <li>■ Wide depression behind foredune ~200 m width until primary dune – significant feature for this stretch of coast.</li> <li>■ Clear evidence of foredune brushing program.</li> <li>■ Well maintained vehicle access tracks to beach</li> </ul>

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Location	Photos	Comments
Car Park		<ul style="list-style-type: none"> <li>■ Car park and associated amenities including toilet block, showers, electric lights and CCTV, BBQs, playground, reticulated grass, shade shelters and picnic tables.</li> </ul>
Green Waste Disposal Site		<ul style="list-style-type: none"> <li>■ The site is located on northern side of car park. It is connected to the beach through the northern vehicle access.</li> <li>■ The elevation of the green waste site is similar to the car park.</li> <li>■ Used as a temporary hardstand area to store green waste for foredune brushing and tyres to demarcate swimming beach extent.</li> <li>■ No evidence of pooling/flooding during the site visit</li> </ul>
View of Existing Platform		<ul style="list-style-type: none"> <li>■ The viewpoint is about 300 m landwards from the beach, on the primary dune, accessible via a small path off beach access road.</li> <li>■ The platform itself appears to be in average condition.</li> </ul>

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## 2 PLANNING AND POLICY CONTEXT

### 2.1 Literature Review

A literature review was undertaken to compile relevant information on planning and policy context; coastal processes and hazards; social, cultural, and environmental context; and past and present management activities for the SoW coast. Additional data sets, and information that was utilised in compiling the document has been referenced throughout. The following is a summary of key documents reviewed:

- Waroona Foreshore Management Plan (Coastwise, 2002)
- Peel Region Scheme (WAPC, 2013)
- Coastal and Lakelands Planning Strategy (WAPC, 1999)
- SoW Local Planning Strategy (Shire of Waroona, 2009)
- SoW Local Planning Scheme (DPLH, 2020)
- Coastal Hazard Mapping for Economic Analysis of Climate Change Adaptation in the Peron-Naturaliste Region (Damara, 2012)
- The Yalgorup Coast – Binningup to Cape Bouvard, Western Australia (Damara, 2009)

These key documents combined with other state-wide policies have informed the development of this Foreshore Management Plan. The sections below summarise items of relevance from documents that have the most influence over the management of the SoW foreshore.

### 2.2 Peel Region Scheme

The Peel Region Scheme is the statutory scheme which applies under the Planning and Development Act 2005, for the LGA areas of Mandurah, Murray, and Waroona. The scheme provides for the reservation and protection of land for public uses and zoning of land for various uses while considering issues such as compensation, environmental values, regionally significant issues, and competing land use requirements (e.g., urban, industrial, agricultural, environmental conservation, mineral extraction). The scheme promotes sustainable development including consideration of regional infrastructure requirements, open space, surface, and ground water. If the Scheme is inconsistent with a local planning scheme, the scheme prevails.

A key aim of the scheme is to protect the region's coastal foreshores as regional open space. The scheme also includes a Boating Facilities Policy which may apply to any boat launching facilities.

### 2.3 State Coastal Planning Policy SPP2.6

The State Coastal Planning Policy, State Planning Policy 2.6 (SPP2.6 - WAPC, 2013), provides guidance for decision-making within the coastal zone, including for managing development and land use change, the establishment of foreshore reserves, and to protect, conserve and enhance coastal values.

SPP2.6 informs and guides decision-making by the Western Australian Planning Commission (WAPC) and its Committees and aims to integrate and coordinate the activities of state agencies that influence the use and development of land in the coastal zone. SPP2.6 also guides local governments, state government agencies, the State Administrative Tribunal, and the State Government on aspects of state planning policy concerning the coastal zone that should be considered in decision-making. The policy provides a framework for coordinating those agencies activities with those of the private sector to ensure a cohesive approach to coastal planning.

SPP2.6 also contains guidance for the preparation of foreshore management plans (sections 5.9 and 5.10). Further information relating to foreshore management plans is presented in the SPP2.6 Guidelines (WAPC).



2013b) in Sections 7, 8, and 9. The SPP2.6 Guidelines also requires that landscape, seascape, and visual landscape elements of coastal planning reflect the advice within the Visual Landscape Planning manual (WAPC, 2007). The manual contains guidance for evaluation, assessment, siting, and design of coastal development. Advice on techniques for incorporating visual landscape planning into typical planning tasks is provided along with guidance on the retention/restoration of natural landforms and vegetation and for the siting of foreshore infrastructure.

## 2.4 Shire of Waroona Local Planning Strategy

The SoW strategy sets out the long-term planning directions for the Shire, applying state and regional planning policies, and provides rationale for zoning. The document considers timeframes to approximately 2035. This strategy presents and updates much of the content of the 1999 Coastal and Lakelands Planning Strategy (WAPC, 1999) with a key change being the WAPC resolution to support deletion of the previously proposed scenic tourist road between Preston Beach and Myalup.

The document identifies a section of frontal dunes a few kilometres north of Preston Beach town as Conservation Wetland and earmarks an expansion of Preston Beach town in future following the release of more residential lots, which has not yet occurred. The strategy notes the intention for the beach car park area to remain the focus for coastal recreation in future.

## 2.5 Shire of Waroona Local Planning Scheme

The scheme sets out the local government planning aims and intentions for the Shire of Waroona - including identifying local reserves, presenting land zoning, controlling, and guiding development and various other items. The scheme maps display the extent of the Shire's foreshore reserves – the study area for the foreshore management plan.

## 2.6 Review of 2002 Foreshore Management Plan

The 2002 Waroona Foreshore Management Plan (Coastwise, 2002) reviewed relevant material available at the time and provided recommendations for the Shire for the management, protection, and preservation of the foreshore. Table 2-1 below summarises the scope, method, and key findings of the work. Table 2-2 presents the 32 Recommendations from the 2002 plan and a summary of their status.





**TABLE 2-1 OVERVIEW OF CONTENT, METHODS AND KEY FINDINGS FROM 2002 SHIRE OF WAROONA FORESHORE MANAGEMENT PLAN BY COASTWISE**

Report section	Notes
1. Introduction	Summarises the scope and objectives of project and introduces the study area.
2. Coast flight and inspections	Documents a site inspection including flight in a light aircraft to collect oblique aerial photography. Note - Despite efforts by WT and Shire staff the resultant photographs have not been able to be located in 2020/21.
3. Environmental assessment	<ul style="list-style-type: none"> <li>▪ Summarises the relevant coastal geomorphology and processes; identifies characteristic flora and fauna and threatened species.</li> <li>▪ Section 3.1 - Notes likely cause of stable shorelines is prevailing onshore winds driving onshore sediment transport.</li> <li>▪ Section 3.2 – Characterises a net northward longshore sediment transport without quantities. Summarises shoreline accretion and recession from 1955 to 1982. Notes accreting sections of coast had most unstable dune areas.</li> <li>▪ Section 3.6 - Notes Chuditch as a threatened species and the Hooded Plover as requiring further investigation.</li> <li>▪ Section 3.7 - Notes high quality scenic values of area and needing to be careful with development impacts (such as placement and colours)</li> </ul>
4. Land use assessment	Considers Aboriginal and European Heritage context; summary of population statistics; previous coastal planning context and documents; current foreshore management and usage.
5. Community consultation	<p>Coastwise undertook a “visioning workshop” and survey questionnaire to identify the values, concerns and visions for the Shire foreshore.</p> <p>Key values were identified relating to the peaceful and remote environment, recreation opportunities, strong local community, and minimal commercial undertakings.</p> <p>Concerns identified included a lack of appropriate parking and rubbish collections, the need for increased Shire Ranger presence, desire for improved foreshore amenity such as shade, access paths, disabled access.</p> <p>Visions for the future included a viewing platform, wheelchair access, fulltime Shire Ranger, cycle paths, increased parking and more shade at foreshore, boat ramp with protective breakwater.</p>
6. Management recommendations	Presents 32 individual recommendations for foreshore management – see Table 2-2 below.
7. Implementation	Identifies approximate implementation costs and timing for each recommendation (short, medium, long term)

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**TABLE 2-2 RECOMMENDATIONS FROM 2002 SHIRE OF WAROONA FORESHORE MANAGEMENT PLAN BY COASTWISE AND NOTES ON THEIR STATUS**

Recommendation	Status
<b>General Recommendations</b>	
<b>Recommendation 1:</b> Pedestrian and vehicular access points onto the beach should be clearly fenced and signposted to prevent general deterioration of vegetation in their vicinity.	New vehicle access and car park area with foreshore amenities was completed between 2002 and 2010.
<b>Recommendation 2:</b> Local native plant species should be used for landscaping in as many places as possible and the spread of exotic plant species should be discouraged wherever possible.	Supported by the Shire where possible.
<b>Recommendation 3:</b> Localised areas of weed invasion should be separately assessed as to the best method of weed eradication and management programs based on the most effective methods should be prepared.	Ongoing
<b>Recommendation 4:</b> Degraded dune areas near Preston Beach should be fenced and covered with brush to discourage pedestrian traffic, to lift the wind off the sand and to promote seed germination and revegetation.	Undertaken by Shire or its contractors for many years, with community-donated green waste deposited in hardstand near beach car park
<b>Recommendation 5:</b> A program to eradicate feral animals from particular areas should be developed by the Shire and CALM in conjunction with the Agricultural Protection Board. The use of baits, trapping and fencing of certain habitats needs to be considered on a site-specific basis.	To be considered within and following this updated FMP.
<b>Recommendation 6:</b> Parking facilities should be set back from the beach on stable land. Parking areas should be separated from the active foreshore by a managed 100m dune buffer.	New vehicle access and car park area with foreshore amenities was completed between 2002 and 2010.
<b>Recommendation 7:</b> Boat launching facilities at Preston Beach should be maintained as low key for the foreseeable future or until adequate funds are available to undertake a detailed engineering assessment.	Not continued as a priority by Shire. Significant work would be required under Peel Region Scheme Boating Facilities Policy (WAPC, 2014)
<b>Recommendation 8:</b> Recreational activities should be given a high priority as a beach use along the Waroona foreshore.	Supported by the Shire where possible.
<b>Recommendation 9:</b> The use of fires along the coast should continue to be prohibited. Personal gas barbeques should be encouraged in order to further reduce the risk of fire spreading to surrounding coastal vegetation.	Enforced by Shire where possible with input from Volunteer Rangers.
<b>Recommendation 10:</b> In the event of a fire, people should be discouraged from entering the affected area so that vegetation cover is replaced as soon as possible.	Supported by the Shire where possible.

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Recommendation	Status
<b>Recommendation 11:</b> The Shire's staff should continue the good work of rubbish collection in order to ensure the maintenance of a litter free coastal environment.	Rubbish collection continued by Shire
<b>Recommendation 12:</b> A sign should be erected at each of the main beach vehicular entry points requesting beach users to remove rubbish and dispose of it through existing rubbish removal services.	Shire installed signage along foreshore.
<b>Recommendations for the Preston Beach Sector</b>	
<b>Recommendation 13:</b> A system of signs for the coast in the Shire should be prepared along with locational guidelines so as to ensure that signs enhance the landscape rather than detract from it.	Shire installed signage along foreshore.
<b>Recommendation 14:</b> The Preston Beach sector is extremely fragile and should be managed conservatively.	With regard to impacts from 4WDing on the beach this has been enforced by Shire where possible with input from Volunteer Rangers.
<b>Recommendation 15:</b> Parabolic blowouts adjacent to the town and amenities should be managed. The recommended management is to prevent pedestrians and vehicles from entering them and if funds and adequate labour can be mobilised, brush the dunes in the same way as the deflation hollow north of Mitchell Road was treated.	Various revegetation works undertaken by Shire.
<b>Recommendation 16:</b> The parking area should be retained in roughly its present position with additional parking spaces provided on the northern side.	New vehicle access and car park area with foreshore amenities was completed between 2002 and 2010.
<b>Recommendation 17:</b> The picnic area should be increased in size and trees should be planted for shade.	New vehicle access and car park area with foreshore amenities was completed between 2002 and 2010.
<b>Recommendation 18:</b> Beach access paths should be constructed from the end of Bouvard Place and two future paths should be designed into the new Preston Beach Golf Resort to the north of the existing townsite. These paths should be fenced, and the edges brushed to ensure sand drift does not occur.	Not pursued as a priority by the Shire.
<b>Recommendation 19:</b> The existing pedestrian path to the beach from the parking area should be maintained in its present form. The opening onto the beach will need regular maintenance to clear excess sand and the dune areas adjacent to the path, especially to the south of the beach entry, need to be brushed to encourage vegetation cover.	Maintained by the Shire.

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Recommendation	Status
<p><b>Recommendation 20:</b> The existing path should be maintained and should be regularly managed to clear excess sand and the dune areas adjacent to the beach exit should be regularly brushed to increase vegetation cover.</p>	<p>Maintained by the Shire.</p>
<p><b>Recommendation 21:</b> The general vehicular beach access system should be maintained but should be improved by constructing T intersections to distribute traffic safely between the southern beaches, parking area and northern beaches. The southern beach access should be realigned to prevent sand being blown directly along the road.</p>	<p>New vehicle access and car park area with foreshore amenities was completed between 2002 and 2010.</p>
<p><b>Recommendation 22:</b> The general beach recreation between the southern vehicle beach access and the northern vehicle beach access should be maintained with vehicles excluded and other activities such as swimming and fishing permitted in particular areas.</p>	<p>This demarcation has continued with the Shire trialling different methods to restrict beach access onto the Swimming Beach.</p>
<p><b>Recommendation 23:</b> A boardwalk should be constructed from the parking area to the beach.</p>	<p>Shire has considered several concept options for boardwalk and viewing platforms to provide increased disabled access to foreshore areas.</p>
<p><b>Recommendation 24:</b> Dogs should be permitted on the beach on the understanding that dog excrement be removed and disposed of by dog owners.</p>	<p>Not pursued as a priority by the Shire.</p>
<p><b>Recommendation 25:</b> An information/education shelter should be constructed in a central area such as the car park to inform people about the management, environmental safety, emergency numbers and nearest public telephone.</p>	<p>Educational signage provided by the Shire with car park redevelopment.</p>
<p><b>Recommendation 26:</b> A system of signs for Preston Beach should be developed so as to direct and inform people but not detract from visual values.</p>	<p>Educational signage provided by the Shire with car park redevelopment and in foreshore.</p>
<p><b>Recommendation 27:</b> A rubbish removal system from the parking/picnic area should be continued and this should be backed up with the expectation that beach users remove their own rubbish and take it home for disposal.</p>	<p>Rubbish collection continued by Shire</p>
<p><b>Recommendations for the Southern and Northern Beach Sectors</b></p>	
<p><b>Recommendation 28:</b> The driving of 4WD vehicles and trail bikes on the northern and southern beaches should be permitted on the understanding that vehicles should not disturb dune vegetation on the back of the beach or enter the dunes for any purpose</p>	<p>Supported by the Shire where possible with assistance from Volunteer Rangers to help educate people 4WDing on the beach.</p>

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Recommendation	Status
<p><b>Recommendation 29:</b> Signs reminding people not to enter into the dunes should be erected at each entry point to the southern and northern coastal sectors.</p>	<p>Shire installed signage along foreshore.</p>
<p><b>Recommendation 30:</b> All litter and rubbish generated in the northern and southern beach sectors should be removed by the beach users and taken home. Signs to this effect should be erected at regular intervals (500 metres).</p>	<p>Shire installed signage along foreshore.</p>
<p><b>Recommendation 31:</b> Additional coastal access points should be identified with CALM possibly in the vicinity of Reserve 11710 in the north. Additional access in the south may be possible via Shire controlled R 22091.</p>	<p>Not pursued as a priority by the Shire.</p>
<p><b>Recommendation 32:</b> The Shire should consider the possibility of forming a Coastal Management Committee to work together with the Preston Beach Progress Association and the Preston Beach Coastcare Group.</p>	<p>Not progressed, the PBPA (Preston Beach Progress Association) provides community representation to the Shire on coastal management issues.</p>



## 3 COASTAL PROCESSES

### 3.1 Coastal Setting

The study area experiences a Mediterranean climate with hot dry summers and cool wet winters with frequent storms. The SoW coastal foreshore is dominated by sand dunes with ridges 45-60m high and several kms wide in places, and generally parallel to the coast (Spearwood and Quindalup dune systems). The coastal zone is characterised by these series of linear, shore-parallel barrier dune systems. Simple, gently sloping bathymetry is present, with nearshore lakes and linear ridges of onshore limestone and sand dune systems (Searle and Semenuik, 1985). This predominantly sandy coast is comprised of sedimentation from the Holocene period.

The nearshore coastal zone is characterised by offshore rocky limestone reefs supporting macroalgae (seaweed communities) and nearshore areas of shallow sand-based benthic habitats dominated by seagrass communities. The limestone reef chains provide significant, but inconsistent, wave sheltering to the coastline, but Preston Beach townsite is more protected than some sections of coast to the north and south. Seasonal weather patterns drive changes to beach width, being wider in summer and narrowing in winter due to storm erosion.

Climate change will cause variations in many environmental variables including mean sea level, ocean currents and temperature, wind climate, wave climate, rainfall/run-off, and air temperature (WAPC, 2013a). Whilst consideration of changes in other variables may be suitable as knowledge improves, the key variable to consider when determining coastal processes is mean sea level rise, which is addressed further below.

### 3.2 Metocean Climate

#### 3.2.1 Water Levels

##### *Astronomical Tides*

Water levels along the SoW coast are dominated by the astronomical tide and are diurnal – meaning that the region experiences one high tide and one low tide per day. The region is characterised by a micro-tidal climate, with a maximal range of ~1 m.

Tidal planes from various sources were reviewed including 1) Department of Transport (DoT) Fremantle Fishing Boat Harbour 2017 submergence curve; 2) Australian National Tide Table 2018; 3) DoT 2010 submergence curve (Table 3-1). There are no direct water level measurements at the site. The tidal planes for the SoW coast have been inferred from the nearby Mandurah site that is approximately 40 km to the north.



**TABLE 3-1 TIDAL PLANES**

Tidal Plane	Fremantle* (AHD m)	Mandurah** (AHD m)	Mandurah*** (AHD m)	Preston Beach (considered by WT, AHD m)
HAT	0.63	0.5	0.46	0.5
MHHW	0.38	0.3	0.24	0.3
MLHW	0.27	0.2	0.18	0.2
MSL	0.04	0.0	0.02	0
MHLW	-0.2	-0.1	-0.15	-0.1
MLLW	-0.3	-0.2	-0.21	-0.2
LAT	-0.51	-0.3	-0.35	-0.4

\*DoT Fremantle Fishing Boat Harbour Apr 2017 - Submergence Curve

\*\*Australia Tide Table (2018)

\*\*\*DoT Fremantle 2010 - Submergence Curve

### Storm Surge

Variations in water level are caused not only by the astronomical tides, but also by phenomena such as wind setup, wave setup, atmospheric pressure, and oceanographic variations. Wind blowing over the surface of the water causes water to “pile up” against the coast towards which the wind is blowing (wind setup). Wave dissipation and breaking also causes water to “pile up” against the coast (wave setup). Atmospheric pressure leads to local changes in sea level, with high pressure lowering the sea level and low pressure increasing the sea level, a process referred to as the inverse barometric effect.

Along the Western Australian coastline, it has long been recognised that ocean climate variability can have a substantial influence on seasonal and interannual variability in coastal sea levels which shows some correlations with the El Nino Southern Oscillation (ENSO) cycle (Pearce & Feng, 2013). Since the 1990s, the Pacific Decadal Oscillation (PDO), with its multidecadal time scale of 20–30 years, has also swung to a negative phase sustaining positive heat content and more frequent cyclonic winds off the WA coast. These large-scale ocean climate drivers are thought to have led to stronger La Nina over the past two decades. These oceanographic processes led to approximately 0.3 m water level increase during the 2011 La Nina event which is not related to either tide or local winds. Impacts from these oceanographic processes may be enhanced in the future due to the increased risk of extreme La Nina events under a warmer climate.

There are numerous other oceanic processes that can cause local variations in sea level at the coast. All these mechanisms combine, resulting in observed water level deviations from astronomical tides. They are often grouped under the term “storm surge” since their combined effects are greatest during a storm event. The study area’s small tidal range means that non-tidal drivers of sea level change (storm surge) are much more important drivers of coastal processes than at locations with larger tidal ranges.

In the Southwest WA region, most storm surges arise in relation to strong winter storms moving out of the Southern Ocean. Significant summer storms and tropical cyclones, while possible, are exceedingly rare. The higher water levels associated with winter storms are significant because they allow high-energy waves from the same storms to propagate into the foredunes and erode them away.

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### Extreme Water Levels

The results of extreme water level analysis for nearby tidal gauges are presented in Table 3-2. They are primarily driven by storm surge resulting from either winter storms or ex-tropical lows.

Extreme water levels suitable for use along the SoW coast have been determined using a linear interpolation between Fremantle and Bunbury as shown in Table 3-2. Note Mandurah Tide gauge is located in the entrance to Peel Harvey Estuary which does not capture the wave/wind setups as opposed to tidal gauges located on the open coast. It is also important to note that it is generally only appropriate to determine ARI values up to approximately three times the length of the data record. Values for ARI's more than three times are considered less accurate. To address this issue with the shorter datasets, multiple sites have been compared.

**TABLE 3-2 EXTREME WATER LEVELS**

Return Periods (Years)	Fremantle (AHD m) Jun 1997-Jan 2011	Mandurah (AHD m) Nov 1990-Jan 2011	Bunbury (AHD m)	Preston Beach (proposed by WT, AHD m)
1	1.14	0.95	1.21	1.17
5	1.24	1.03	1.31	1.27
10	1.29	1.07	1.36	1.32
25	1.34	1.11	1.41	1.37
100	1.36	1.14	1.45	1.40
200	1.42	1.18	1.49	1.45

### Sea Level Rise

SPP2.6 (WAPC, 2013a) requires that a vertical sea level rise of 0.9 m be adopted when considering the impact of coastal processes over a 100-year planning timeframe. As the timeframe for this FMP is considerably less than 100 years, a review of the sea level rise projections was undertaken. IPCC AR5 (Church J.A., 2013) provides the most recent updates of global sea level rise projections built on progress in understanding of sea level change over the last decade. It considers a range of representative concentration pathways (RCPs) e.g., RCP2.6, RCP4.5, RCP6.0 and RCP8.5 for greenhouse gas emission scenarios. The improved understanding shows regional differences in the rate of SLRs which led to the study by CSIRO (Church & Kathleen L. McInnes, 2016). Table 3-3 presents the RCP8.5 projections extracted from IPCC AR5 and CSIRO 2016 reports relevant to the study area. For 2030 the anticipated sea level rise in the study area is approximately 0.05 m (the difference of the IPCC projections for 2020 and 2030 – **highlighted** in Table 3-3 below).

**TABLE 3-3 SEA LEVEL RISE PROJECTIONS AT FREMANTLE (MEDIAN VALUES AND 66% LIKELY RANGES)**

Scenarios	Average (1985-2005)	2020	2030	2070	2090
RCP 8.5 (IPCC AR5)	0	<b>0.08</b> (0.05-0.10)	<b>0.13</b> (0.08-0.17)	0.43 (0.29-0.54)	0.62 (0.43-0.82)
CSIRO (Fremantle)	0	0.08 (0.05-0.10)	0.12 (0.08-0.17)	0.41 (0.27-0.56)	0.61 (0.39-0.84)

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### 3.2.2 Winds

Southwest WA experiences a synoptic climate mainly influenced by typical summer anticyclonic high-pressure systems which are associated with daily sea breezes – easterly winds in the morning and westerly winds in the afternoon. Winter storms bring wind regimes variable in direction and intensity. The wind climate in the study area is characterised as follows (see Figure 3-1 for wind roses at Mandurah):

- Summer is usually very calm while occasionally interrupted by periodic low-pressure ex-tropical cyclones from the north. Typical summer wind comprises of a moderate to afternoon sea breeze with wind blowing from the south-south-west. Wind generated by dissipating tropical cyclones in summer can have extremely dramatic but noticeably short term affects. Common features are morning easterly winds and the diurnal south-westerly to southerly sea breezes.
- Winter climate is characterised by mild weather and winds interspersed by winter storms. Winter wind is variable due to the presence of winter storms from various directions. Strong winds are predominantly from the west/north.
- Diurnal sea breeze is one of the typical meteorological features. It is generated by thermal gradients between land and sea as land absorbs and releases heat a lot quicker. In WA, the sea breeze is among the strongest worldwide.

Although rare the SoW coast may occasionally experience tropical cyclones (e.g., Mangga, Alby) from the Indian Ocean. These strong storm events are typically stronger than winter storms and bring strong wind gusts and heavy rainfalls along the track of the cyclone and often result in flooding from rainfall, coastal inundation, and major erosion hazards.

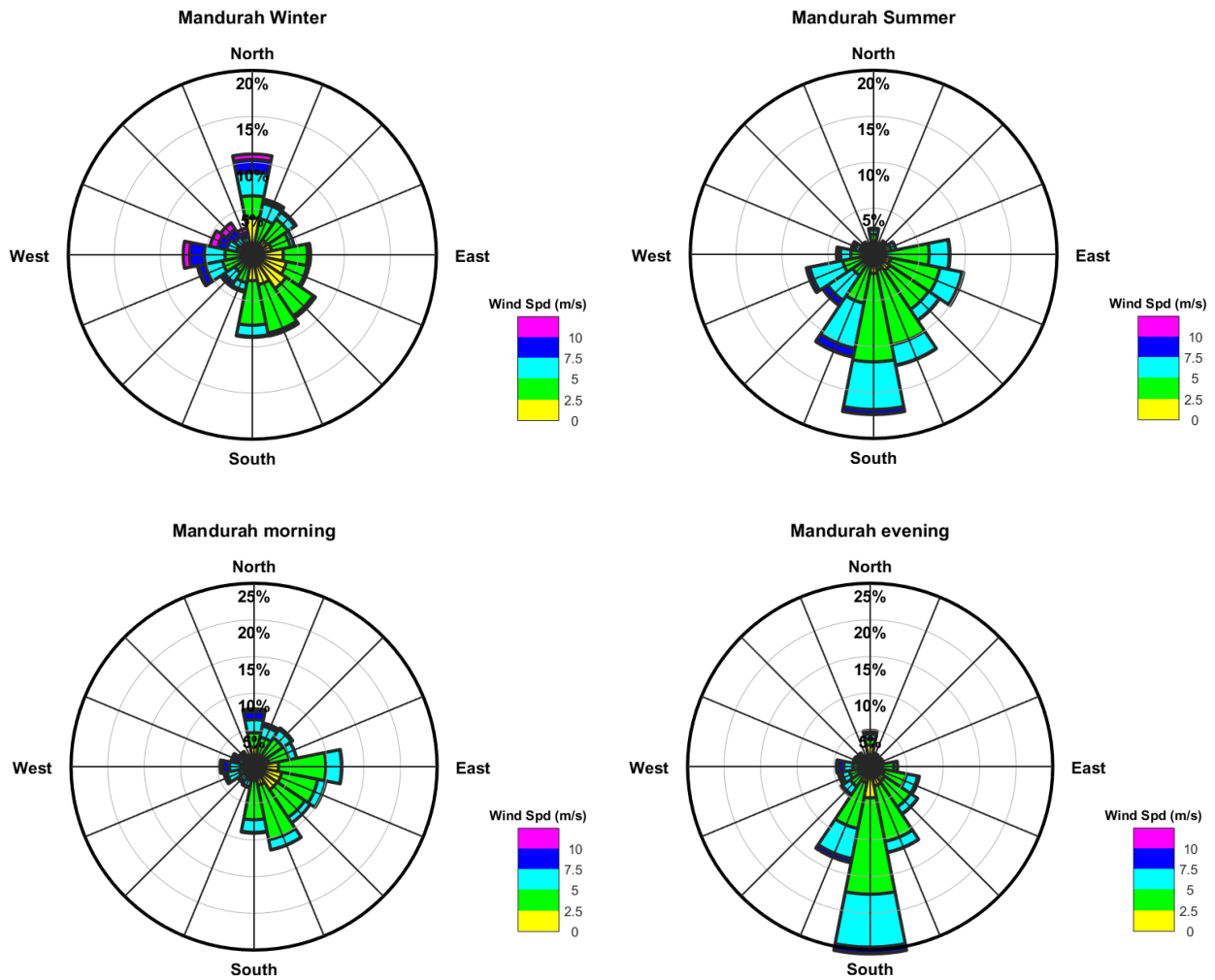


FIGURE 3-1 WIND ROSES AT MANDRUAH (BOM WIND DATA 2010-2020)

### 3.2.3 Waves

The wave climate at SoW is dominated by deep-water waves generated by large-scale weather systems over the Indian and Southern oceans. Seasonal variability in the wave climate is driven by the following mechanisms:

- Continuous west to southwest offshore swells from the southern Indian Ocean
- Seas generated by the local sea breeze pattern with short periods (e.g., <8 s) from the west to southwest predominantly from October to April.
- Seas generated by winter storms from various directions.
- Infrequent tropical/extratropical cyclones (e.g., Alby in 1978 and Bianca in 2011)

The presence of offshore ridges rising to depths of as little as -3.0m AHD (DPI, 2007) plays a significant role in modifying the nearshore wave climate and sheltering the coastline. This sheltering is likely to have had a large effect on the littoral drift processes locally and shaped the coast. During the site inspection, constant wave breaking was visible across the offshore ridges (approximately 5km offshore).

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### 3.3 Coastal Geomorphology and Sediment Transport

#### 3.3.1 Coastal Landforms and Geomorphology

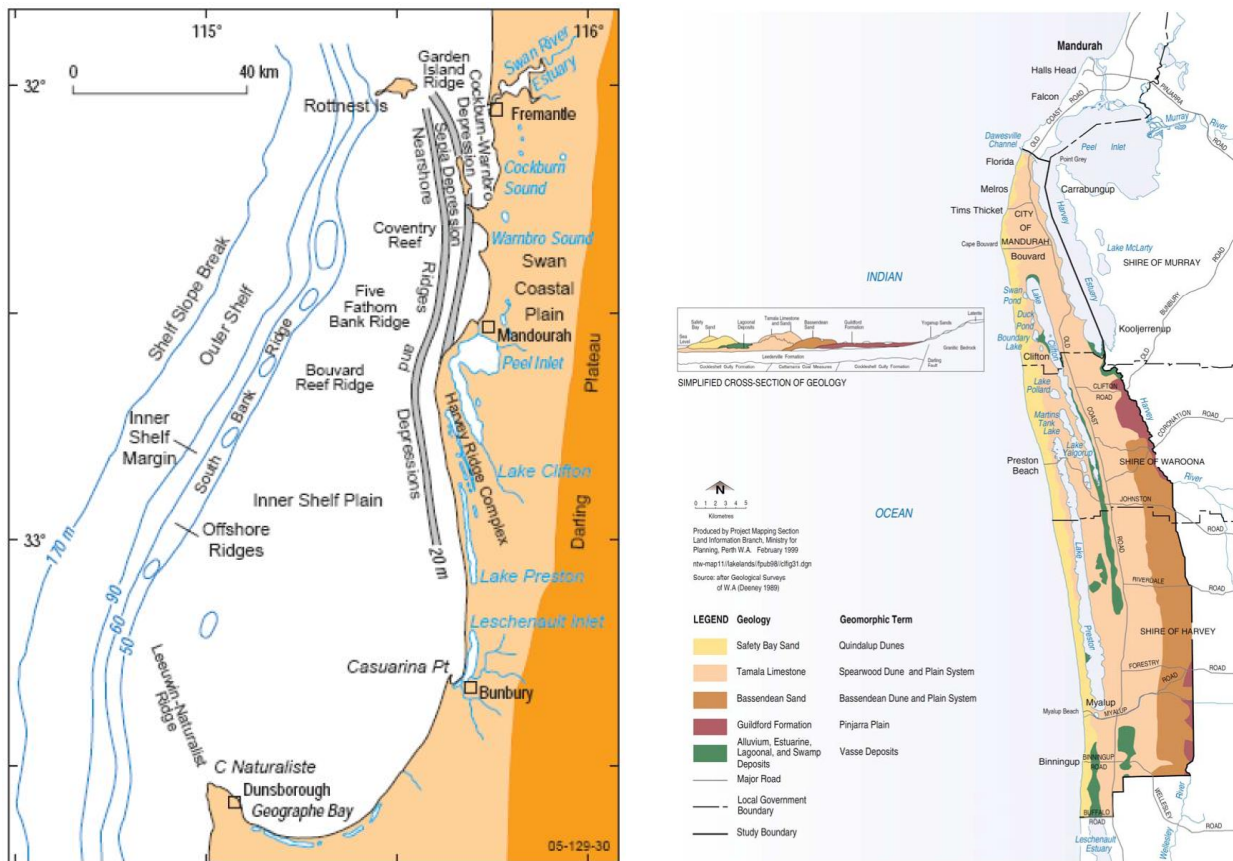
Historic reports were reviewed to provide the context of local coastal processes. Regional morphology and geology characteristics are presented in Figure 3-2. The coastal geomorphology of the area between Mandurah and Bunbury is fragile and fronts an extensive environmentally significant lake system. Retention of the rural, bushland and lakeland character of the area between Mandurah and Bunbury and the protection of important natural habitats within the strategy area will have increasing significance for the present and the future generations of Western Australians (WAPC, 1999). There are no known erosion hotspots of state significance along the Shire's coastline according to the DoT's state-wide assessment (Seashore Engineering 2019).

The foreshore is characterised by simple offshore bathymetry, sand dunes parallel to the coast and depressions/wetlands/lakes between dune ridges. Offshore reefs rise to between 10-5m depth several kilometres offshore. Dunes commonly reach heights of ~40m and are often present as naturally unvegetated dune "blowouts" which demonstrates the important of wind-driven processes in the area. A feature of the region is the separation of foredunes from primary dunes resulting in dune depressions which are sometimes vegetated by sedgeland, and occasionally below water table levels – particularly in winter (Damara, 2016).

Studies have noted the presence of underlying limestone rock in some areas, but it is seldom observed above mean sea level.

Beach sands are predominantly made up of quartz from re-working of Holocene deposits. Some calcareous sand is present from adjacent estuaries and seagrass beds and riverine inputs are minimal (Searle and Semenuik, 1985). The SoW coast is dominated by Quindalup Dunes, comprised of Safety Bay Sands, which have been reworked over the Holocene period, approximately the last 6,000 years (Damara, 2009).

At a geological scale, sand dune evolution is continuing at present as sediment is moved along and across the shore which contributes to development of the dune ridge through the formation of foredunes, blowouts and sand dunes as the barrier moves inland (Damara, 2009). The formation of dunes and their migration currently utilises sediment supply from offshore and alongshore from the south. Alongshore variations in beach erosion, foredune formation and dune development occur because of the complex processes resulting from modern metocean process reworking the geological scale landforms.



**FIGURE 3-2 REGIONAL MORPHOLOGY AND GEOLOGY (DAMARA, 2009)**

Key geomorphological features are distinct foredunes, primary dunes and secondary dunes with nested blowouts/parabolic dunes, mobile sand sheets and deflation basins. These features are present both in vegetated, partially vegetated and unvegetated states (Damara, 2009)

### 3.3.2 Long Term Shoreline Evolution

The location of beach waterlines and vegetation lines occurs over a range of time scales including:

- At the geological scale (10-100,000+years), coastal change is dominated by sea level movements and large-scale geological processes primarily dealing with the location and movement of rock.
- At geomorphic scales (100-10,000years), coastal evolution is determined by the sediment transport driven by regional and local metocean climate and sediment provenance and availability.
- Over planning scales (10-100years), sediment sources and sinks and pathways due to local landform changes and metocean climate and weather events.
- Over coastal management scales (Days to 10years), significant changes occur due to storms – generally cross-shore erosion.

There have been significant shoreline variations in the past 6000 years as reported by (Semenuk V, 2000) . At geological scales, shorelines have a variable nature due to limited rock features and presence of mobile sand ridges (see Figure 3-3).

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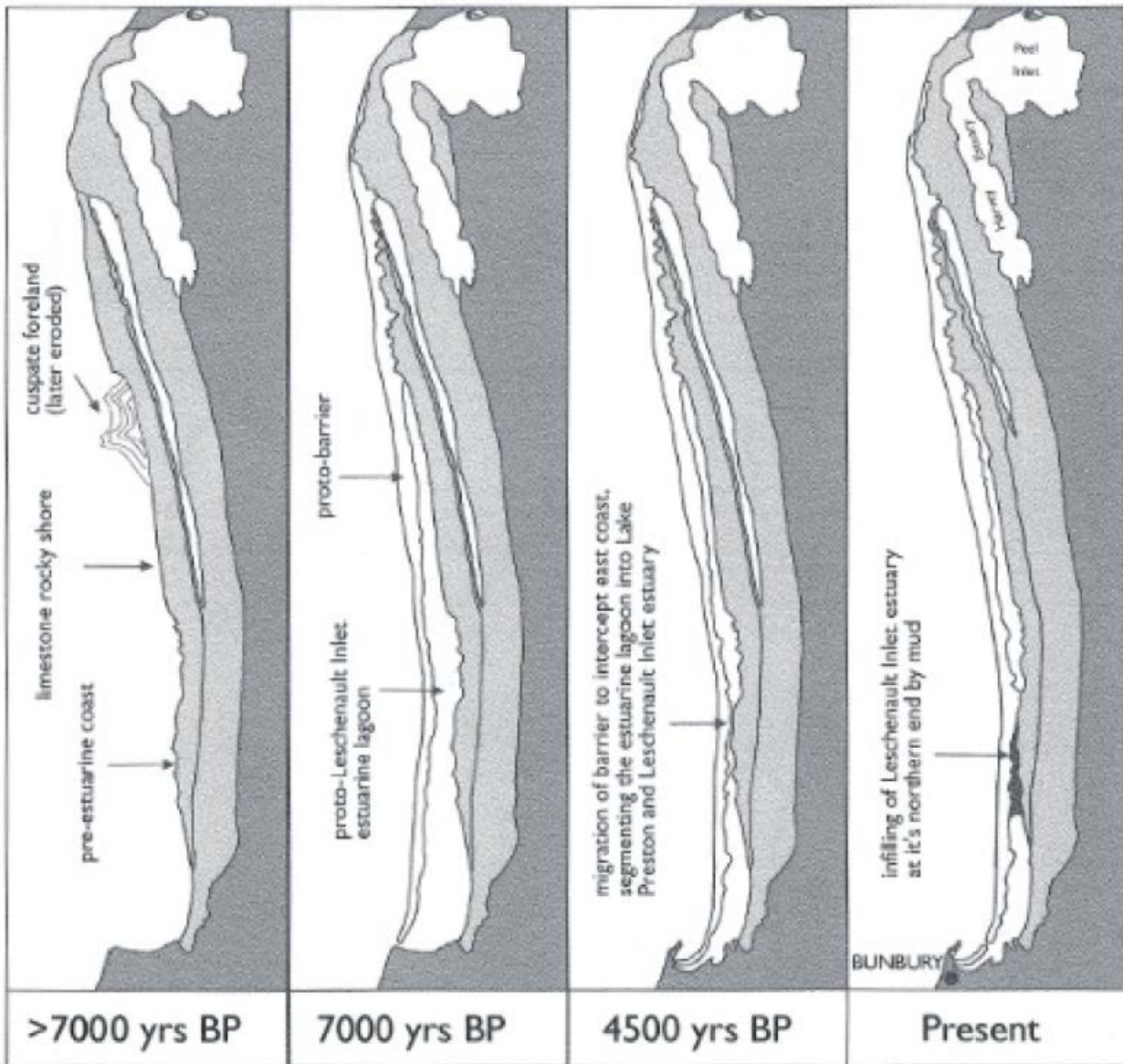


FIGURE 3-3 LONG TERM COASTAL EVOLUTION (SOURCE: SEMENUK V., 2000)

### 3.3.3 Sediment Cells and Beach Formation

A hierarchy of sediment cells is used to assist coastal planning, management, engineering, science, and governance along the coast. Sediment cells are spatially discrete areas of the coast within which marine and terrestrial landforms are likely to be connected through processes of sediment exchange, often described using sediment budgets. They include areas of sediment supply (sources), sediment loss (sinks), and the sediment transport processes linking them (pathways). Sediment transport pathways include both alongshore and cross-shore processes, and therefore cells are best represented in two-dimensions. They are natural management units with a physical basis and commonly cross jurisdictional boundaries (Stul et al., 2015). Figure 3-4 depicts a typical display of sediment cell layout.

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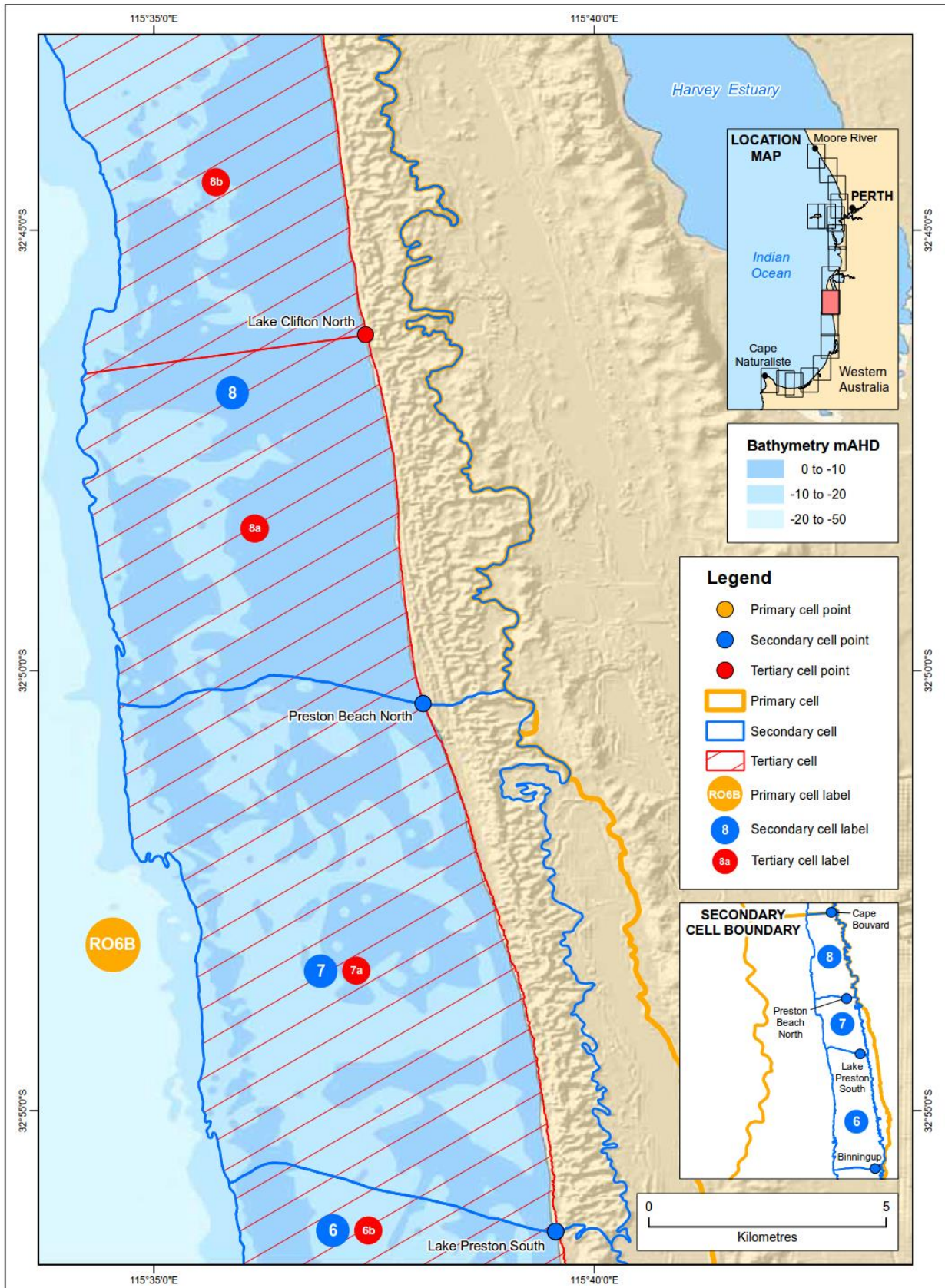


FIGURE 3-4 SEDIMENT CELLS ALONG SHIRE COAST (STUL ET AL 2015)

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Sediment cells provide a summary of coastal data in a simple format and can be used to:

- Identify the geographical context for coastal evaluations.
- Provide a visual framework for communicating.
- Support coastal management decision-making.
- Support other technical uses; and
- Reduce problems caused by selection of arbitrary or jurisdictional boundaries.

Sediment cells were defined in three steps through the selection of points along the shoreline, offshore and onshore boundaries, and alongshore boundaries connecting the beach face points to the offshore and onshore boundaries. The cells have been mapped as a hierarchy of primary, secondary, and tertiary levels to incorporate three space and time scales. This hierarchical representation of cells gives a basis for implementation of integrated planning and management at a range of scales, from small-scale engineering works, through to large-scale natural resource management.

Primary cells are related to large landforms and are most relevant to potential change in large landform assemblages or land systems over coastal management timescales of more than 50 years. Secondary cells incorporate contemporary sediment movement on the shoreface and potential landform responses to inter-decadal changes in coastal processes (Stul et al., 2015). Tertiary cells are defined by the reworking and movement of sediment in the nearshore and are most relevant for seasonal to inter-annual changes to the beach face. The tertiary cells are the most relevant for the preparation of this Foreshore Management Plan.

Sediment cells provide an indication of a spatial area within which marine and terrestrial landforms are likely to be connected through the process of sediment exchange. This implies that either natural or imposed changes at any point in the cell may affect any other part, recognising such relationships are strongly bound by proximity. A fundamental use of sediment cells is therefore one of context, to identify an area that should be considered in a coastal study. They help focus coastal managers' attention upon the connected nature of marine and terrestrial landforms (Stul et al., 2015). Given the ~10-year timeframe for this Foreshore Management Plan it is important that any management decisions regarding assets or key areas consider the behaviour of the entire tertiary sediment cell to which it belongs.

The Shire of Waroona coast is located within primary cell RO6B, secondary cells 7 and 8 and tertiary cells 7a (south) and 8a (north). Information for these cells is summarised in Table 3-4.

**TABLE 3-4 SEDIMENT CELL AND BEACH FORMATION SUMMARY**

Sediment Cell	Geomorphology Notes
R06B8. Preston Beach North to Cape Bouvard	<ul style="list-style-type: none"> <li>▪ Continuous -15m AHD isobath closest to shore</li> <li>▪ Narrow parabolic dunes</li> <li>▪ Cuspate beach berm features evident in swash zone.</li> <li>▪ Beach salient at southern end is approximate "open" boundary</li> </ul>
R06B7. Lake Preston South to Preston Beach North	<ul style="list-style-type: none"> <li>▪ Continuous -15m AHD isobath closest to shore</li> <li>▪ Narrow parabolic dunes</li> <li>▪ Cuspate beach berm features evident in swash zone.</li> <li>▪ Beach salient at northern end is approximate limit of broad mobile dunes</li> </ul>

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### 3.3.4 Sediment Transport

Sediment transport along the SoW coast is summarised by:

- Prevailing southerly/south-westerly sea breezes and waves driving sediment northwards in the wave-breaking zone and nearshore areas.
- Long-term patterns are interrupted by storm events from the northwest which can temporarily reverse sediment transport – moving sand from north to south.
- Seasonal changes in beach width due to changes in seasonal wave climate – more large energetic waves in winter causing erosion and narrowing of beaches.
- Intensive erosion from very severe storms such as Cyclone Alby in 1978 and the large storm in 1996. These exceptionally large events may cause stepwise changes as opposed to seasonal changes generated by typical winter storms.
- A lack of detailed datasets and analysis – the information above is largely based on metocean weather information and shoreline movement analysis as opposed to local beach 2D or 3D beach profile change in formation.

### 3.3.5 Coastal Monitoring

Coastal monitoring activities in the shire of Waroona include the following:

- Beach width measurements
- Dune measurements
- Oblique aerial photos
- Field photographs

#### *Beach width and dune measurements*

The Peron Naturaliste Partnership (PNP) currently undertake annual monitoring of primary dune positions near Preston Beach and beach width monitoring across the Shire's coastline.

Dune monitoring is undertaken near the town (commenced in October 2017). One dune (to the south of the beach access road) is quite stable with minimal change in vertical height. The other dune (to the north of the beach access road) has been very mobile with ~1.4m of vertical movement recorded between October 2017 and November 2018. This required the establishment of a new monitoring point which the dune is approaching. This early data demonstrated the dynamic nature of the local sand dunes and the importance of the unvegetated dune blowouts in shaping the local foreshore landforms.

PNP coordinate the undertaking of beach width monitoring at four locations in the Shire of Waroona at approximately monthly intervals and have done since March 2017. This work is part of a larger project across the PNP study area. The beach widths are measured using handheld GPS from a fixed landward point. The seaward extent of beach width measurement is the 'mid-swash' approximation of the shoreline. This location is determined by observing the waves for several minutes and locating the approximate mid-point between the highest level on the beach that the water reaches and the lowest level that the water recedes. This method does not correct for water levels (i.e., during the periods of high tides and surge the beach appears narrower although sand may not have eroded) but is useful to monitor long term behaviour of the beach and to compare between sites. Beach widths have varied by between 30-40m at the sites between March 2017 and July 2020, but typically are constrained to changes within 10-20m. The most extreme changes have been July and August 2019 (average of 19m erosion across the four sites) and April to May 2020 (average of 21m erosion across the four sites).





### *Oblique aerial photos*

The University of Western Australia (UWA) in collaboration with the PNP collect oblique aerial photos approximately twice per year and have done since December 2014 (UWA, 2020; Figure 3-5). The bi-annual photos provide a qualitative means of assessing seasonal and longer-term coastal change. With more advanced processing the photos may also be able to be used to derive quantitative information. Prior to 2017 the photos were taken using a point-and-shoot camera by PNP staff from a helicopter. Beginning in 2017 the photos were taken by UWA as geo-tagged photos collected from a helicopter flying at approximately 300 m elevation and 300 m offshore.



**FIGURE 3-5 EXAMPLE OBLIQUE AERIAL PHOTO COLLECTED BY UWA FOR PNP AT JUNE 2020.**

### *Beach field photos*

PNP coordinate the collection of field photographs whilst undertaking beach width measurements described above – four locations at approximately monthly intervals. In general, four photos at each site are collected – one in each direction at the waterline and one in each direction at the vegetation line (Figure 3-6).

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**FIGURE 3-6 EXAMPLE BEACH FIELD PHOTOS COLLECTED AT SAME TIME AS BEACH WIDTH MEASUREMENTS.**

CoastSnapWA is a coastal monitoring program which uses photos taken by community members on smart phones from fixed marker points which determine their field of view and enables these to be shared on social media to demonstrate the range of local coastal processes (UWA, 2020; Figure 3-7 ). A CoastSnapWA site was installed at the Preston Beach swimming beach in Autumn 2020.



**FIGURE 3-7 COASTSNAPWA LOCATION AT PRESTON BEACH (LEFT) AND EXAMPLE PHOTO FROM THEIR FACEBOOK PAGE AT JULY 2020**

### 3.4 Coastal Hazard Risk

#### 3.4.1 Erosion Risk Assessment

The State Coastal Planning Policy - State Planning Policy 2.6 (SPP2.6 - WAPC, 2013) 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.

To determine an allowance for coastal processes in the foreshore reserve, SPP2.6 requires different methodologies for different classifications of coast. The Shire's coastline is Sandy Coast. In accordance with SPP2.6 Water Technology have used the relevant methodology to determine erosion hazard areas. The natural coastline is constantly susceptible to erosion through short term processes, such as storm surge, and long-term processes, such as rising sea levels and changes to alongshore sediment transport. The various forms of erosion are defined in SPP2.6 as (WAPC, 2013):

- S1 Erosion - Allowance for the current risk of erosion (requires consideration of the 1 in 100-year Average Recurrence Interval (ARI) storm event).
- S2 Erosion - Allowance for historic shoreline movement trends; and
- S3 Erosion - Allowance for erosion caused by future sea level rise.

The overall hazard extents associated with these processes is calculated by the summation of the above allowances, plus an additional allowance for uncertainty. The values are measured from the Horizontal shoreline Datum (HSD) which is the active limit of design storm activity. To inform this Foreshore Management Plan the 2030 erosion hazard has been calculated.

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### 3.4.1.1 Storm Erosion (S1)

The potential for storm-induced acute erosion was assessed using the SBEACH numerical model (see detailed description of model setups in Appendix A). This model was developed to calculate short term wave induced erosion and has been utilised in a range of studies including shoreline stability assessments in Western Australia.

Representative beach profiles are determined for each shoreline segment investigated. The profiles extend from about -5 m to up to 10 m AHD across the beach face. Profile locations are shown in Figure 3-8.



**FIGURE 3-8 SBEACH PROFILES**

DoT Lidar data (from ~-30 m contour landwards) and Department of Water and Environmental Regulation (DWER) topography survey data are merged to generate seabed levels and beach face elevations for each transect. The model does not incorporate hard sublayers, seawalls, or any other physical controls. Other model settings e.g., sand grain sizes, temperature, transport rate coefficient, transport rate decay coefficient, avalanche slope and surf zone depth are configured as appropriate. Water Technology has previously undertaken SBEACH calibrations (e.g., Wedge and Grey erosion hazard assessment) and relevant information has been utilised in this project.

Critical inputs utilised for each profile include:

- Digital elevation data from +10m AHD down to -5 m AHD offshore
- Time-series of water level from the design events (tide plus surge)
- Time-series of significant wave height ( $H_s$ ), Peak wave period ( $T_p$ ) and Wave direction ( $W_{dir}$ )

SBEACH modelling including model setup and result plots are attached in Appendix A. A summary of the SBEACH modeling results is provided below. The most significant finding is the large variation in erosion distances for different return period storms:

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- The 100-year ARI storm event (rare storm) generates an S1 erosion distance of about 30m measured from the Horizontal Shoreline Datum (HSD, approximately the 2 m AHD contour). The results are similar for all three beach profiles.
- The 50-year ARI storm event (possible storm) generates about 5 m S1 erosion measured from the HSD.
- The 10-year ARI (or lower return period) storm event (almost certain storm) generates almost no S1 erosion but changes sections of the beach profile seaward of HSD line.

The likelihood of the 10-year ARI and 100-year ARI storm events occurring during the 10-year planning period is about 65% and 10% respectively. As such, the beach is not likely to be affected by severe storm erosion in the next 10 years, but it is possible. Under rare occasions, the stretch of shoreline may experience up to 30 m erosion by a 100-year ARI storm as indicated by the model results. If the foredune is eroded by sequences of severe/rare storms (over several months or years), the land depression behind could be flooded by seawater and additional erosion may occur. These results align well with findings from Damara (2016) for the adjacent coastline to the south in the Shire of Harvey, giving a similar value of around 30m for erosion from a severe storm.

#### 3.4.1.2 Historic Shoreline Trend (S2)

Shoreline change at Preston Beach has been investigated through the review and analysis of historic shoreline movement data and aerial imagery provided by the DoT. Historic vegetation lines are available for the following years: 1955, 1984, 2008 and 2016 and are produced via photogrammetry analysis of historical aerial photos (see Figure 3-9, Figure 3-10 and Figure 3-11). Cross comparison with the digital elevation model indicates that the vegetation lines are generally between the 2.0 and 3.0m AHD elevation contours.

Shoreline recession rates are calculated in accordance with SPP2.6 as the average evolution rate over the discrete section of coastline divided by the time intervals. The main findings of the analysis are summarised below:

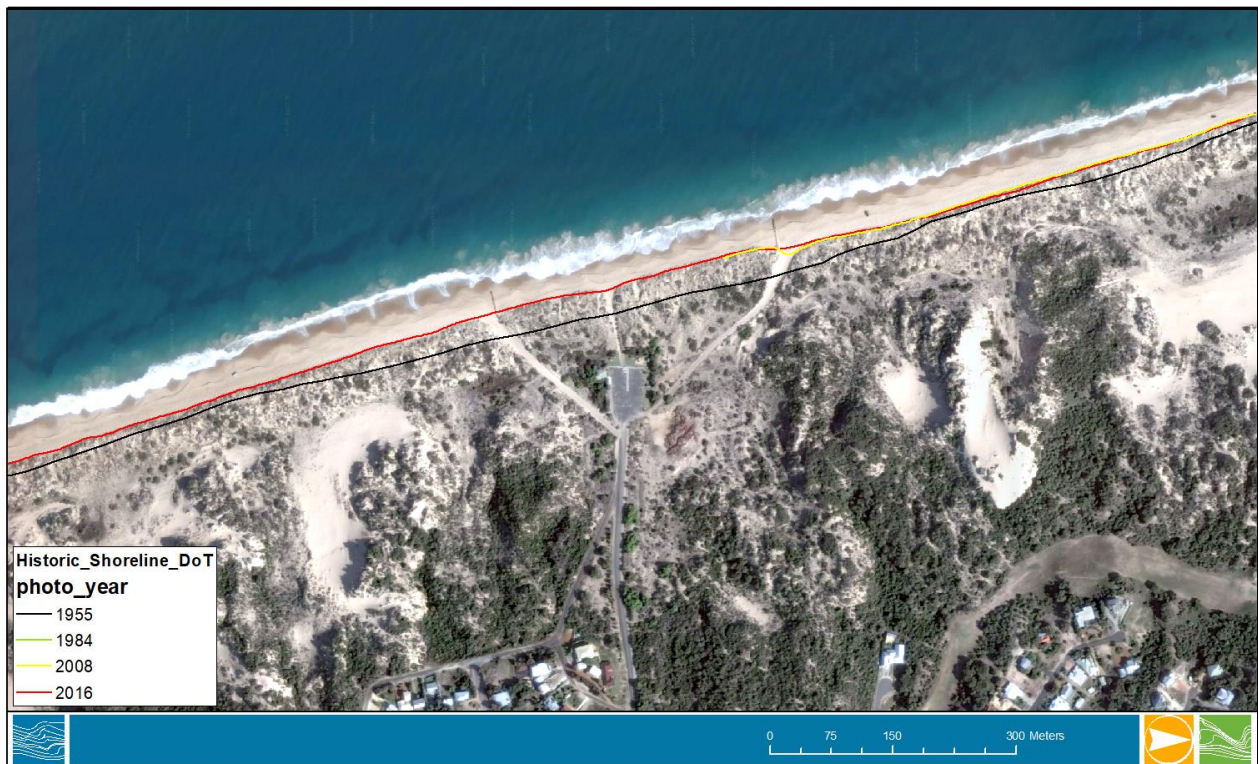
- The southern section of the study area experienced a weak shoreline alteration in the past 65 years. The maximum difference among all years is about 20 m. There has been only minor shoreline change in the past 10 years. The shoreline movement between 2008 and 2016 is largely unnoticeable.
- The middle section of the study area experienced a medium rate of accretion (~ 20 m, or ~0.3 m per year) at the swimming beach area near/between the two vehicle access paths in the past 65 years. In the last 10 years, the shoreline is very steady showing no sign of either accretion or erosion. Near the southern vehicle access path, the 1955 shoreline is about 5-10 m (~0.1 to 0.2 m per year) landward of the current shoreline. The accretion of earlier years (between 1955 and 2008) may be affected by local management and maintenance e.g., brushes, prohibiting 4WD access at the swimming beach, but could also be a natural accumulation with the area acting as a local sediment sink.
- The northern section of the study area experienced a weak accretion (~10 m or ~0.2 m/s) in the past 65 years. Like the other sections, there is no indication of significant shoreline change in the past 10 years.

The assessment shows a stable shoreline along the study area for the planning time frame considered by this Foreshore Management Plan (10 years). This natural situation is fortunate for the future management of the area, as although some minor maintenance works are undertaken e.g., foredune brushing, demarcation of the vehicle access ways etc, there have been no known major projects required to maintain shoreline position such as nourishment and physical controls (like seawalls and beach groynes).

Overall, the shoreline assessment indicates a weak accretion of the shoreline in the past 55 years and a steady shoreline in the past decade. To be conservative, the S2 allowance is considered as 0m per year for the purpose of coastal hazard mapping.



**FIGURE 3-9 HISTORIC SHORELINE – SOUTHERN SECTION**



**FIGURE 3-10 HISTORIC SHORELINE – MIDDLE SECTION**

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**FIGURE 3-11 HISTORIC SHORELINE – NORTHERN SECTION**

### 3.4.1.3 Erosion Caused by Sea Level Rise (S3)

Future sea level rise (SLR) will vary around the WA coast and requires consideration on a local scale and case by case basis. Mean sea level is the focus of SPP2.6, which does not directly consider the changes to extreme water levels, which will occur because of the rise in mean sea level and possibly through changes in storminess. DoT (2010) recommends that a vertical sea level rise of 0.9 m be adopted when considering the setback distance and elevation to allow for the impact of coastal processes over a 100-year planning timeframe.

The primary projected impacts of mean sea level rise are its contribution to increased shoreline erosion and inundation. SPP2.6 requires these to be considered for sandy coasts as S3 erosion. The S3 erosion allowance has been calculated in accordance with SPP2.6, assuming that for each 1cm of vertical mean sea level rise there will be 1m of horizontal shoreline erosion (Figure 3-12).

Estimates of shoreline movements from future sea level rise are presented in Table 3-5.

### 3.4.1.4 Allowance for Uncertainty

On a sandy coast the allowance for erosion should be measured from the HSD and calculated as the sum of the factors: S1 Erosion; S2 Erosion; and S3 Erosion plus 0.2 metres per year allowance for uncertainty (WAPC, 2013).

### 3.4.1.5 Erosion Hazard Lines

The erosion hazard allowance has been calculated in accordance with SPP2.6. The total erosion allowances are presented in Table 3-6 for three different planning time periods: present, 2025, 2030 respectively, and three different erosion likelihood scenarios: almost certain (10-year ARI storm), possible (50-year ARI storm), and rare (100-year ARI storm).

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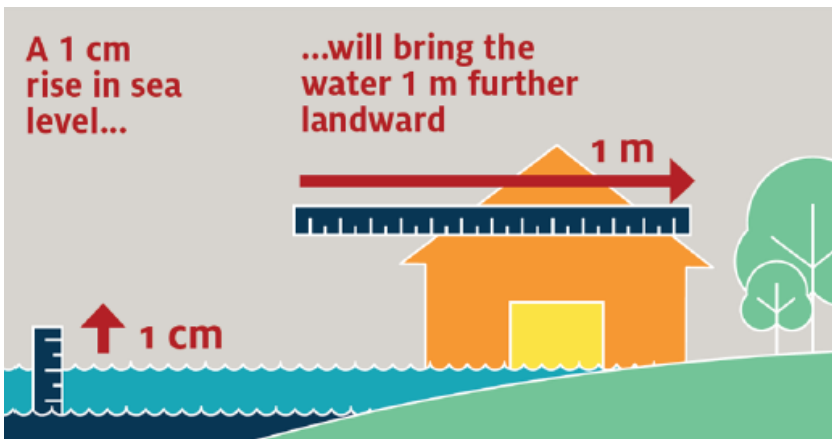


FIGURE 3-12 SCHEMATIC REPRESENTING THE HORIZONTAL EROSION ALLOWANCE FROM PROJECTED VERTICAL SEA LEVEL RISE – A FACTOR OF 100 TIMES (COASTADAPT 2017)

TABLE 3-5 SUMMARY OF SEA LEVEL RISE AND PREDICTED SHORELINE MOVEMENT (S3)

Planning Timeframe	2020	2025	2030
Sea Level Rise (m)	0	0.02	0.05
Predicted Shoreline Movement (m)	0	2	5

TABLE 3-6 EROSION HAZARD ALLOWANCE (M)

Shoreline Segment	Present			2025			2030		
	Almost Certain	Possible	Rare	Almost Certain	Possible	Rare	Almost Certain	Possible	Rare
South Beach	0	4	30	4	8	34	7	11	37
Swimming Beach	0	0	25	4	4	29	7	7	32
North Beach	0	4	30	4	8	34	7	11	37

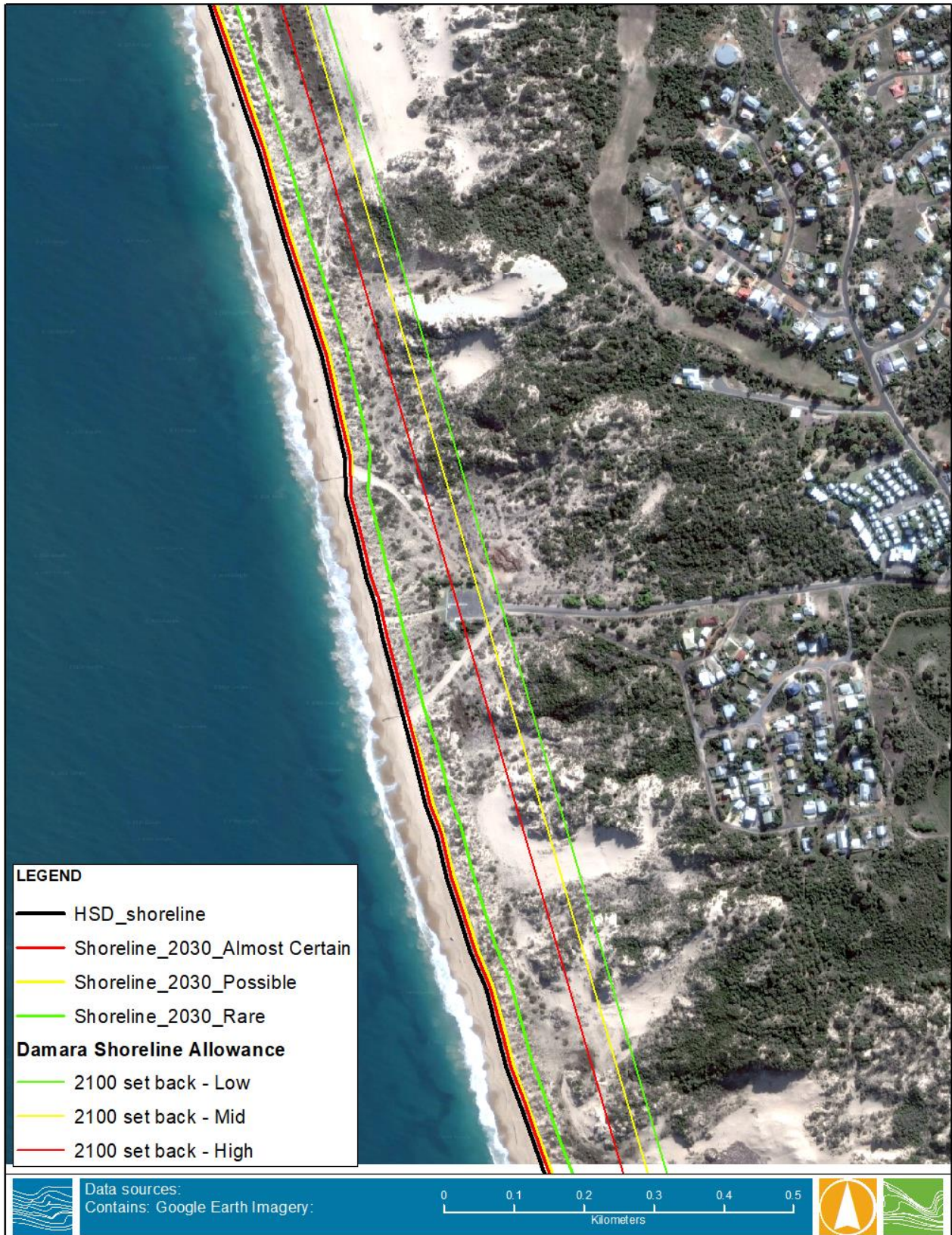
Erosion allowances are very similar for each investigated shoreline segment, due to the continuous nature of the beach along the study area. The beach is in a dynamically stable equilibrium and is well adapted to regular winter storms.

The area is still likely to be vulnerable to long term erosion (e.g., in a 100-year planning period) due to the increased risk of severe storm impacts combined with erosion from sea level rise. Due to the presence of the dune deflations behind the foredune, future erosion could continue slowly until the foredune is breached and then may accelerate. This should be considered further during longer-term planning works.

The estimated erosion hazard lines in the vicinity of the car park and Preston townsite in 2030 are presented in Figure 3-13 below. Except vehicle access ways and sand dunes, no other coastal assets are found located within the predicted erosion hazard zone. Figure 3-13 also displays regional erosion hazard lines for the year 2110. These lines were prepared by Damara (2012) under contract to the Peron Naturaliste Partnership to consider the potential economic impact of coastal hazard risk. The lines were not prepared in accordance with SPP2.6, instead utilising a geological regional recession study which focused on sediment transport between the coast and continental shelf. As such they are not directly comparable to the 2030 hazard lines determined for this FMP. They do however provide useful background information and represent what erosion could be possible over the next 100-years and the variability associated with these types of projections. High, medium and low probability lines for 2110 are shown.

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**FIGURE 3-13 EROSION HAZARD LINES (ALMOST CERTAIN, POSSIBLE AND RARE) IN 2030; DAMARA (2012) HAZARD LINES 2100**

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### 3.4.2 Inundation Risk Assessment

#### 3.4.2.1 Inundation Levels

Coastal inundation is the flooding of land by water from the ocean, usually due to the combined effects of storm surge and wave run-up during severe weather events. Inundation level is defined as the peak steady water level (PSWL) plus wave runup. PSWL is determined according to Table 3-2. Wave runup is estimated based on SBEACH model results. We have also reviewed the digital elevation data and noted that the mapped inundation area is not sensitive to small changes in inundation levels unless uncertain thresholds are exceeded.

SPP2.6 recommends consideration of a 500-year ARI event for the assessment of coastal inundation risk. The occurrence probability of such an event in the 10-year planning period is only 2%. Our review suggests this event may be too conservative for an inundation risk assessment for this project. Some lower return period events are thereby recommended in Table 3-7. The predicted sea level rise is about 5 cm in the next 10 years and this impact is included in the inundation hazard mapping.

**TABLE 3-7 ALLOWANCE FOR STORM SURGE INUNDATION IN 2030 (S4)**

Return Period (Years)	PSWL at Preston Beach (AHD m)	Wave Runup (m)	Sea Level Rise (m)	Inundation Level on Beach Face (m AHD)
1	1.2	0.6	0.05	1.8
10	1.3	0.8	0.05	2.2
100	1.4	1.0	0.05	2.5

#### 3.4.2.2 Inundation Mapping

Inundation hazard is mapped by a bathtub model (see Figure 3-14) - all areas with ground level lower than the predicted inundation level are considered under risk of coastal inundation.

- The beach face will be inundated by wave runup. The water will likely reach up to the toe of the foredune. It is also possible that beach erosion may accelerate coastal inundation (this is not depicted in current mapping).
- The primary foredune has a crest elevation of over 5 m AHD which will not be inundated. This continuous dune barrier can sustain a 100-year ARI storm (or even greater) over the next 10 years and will likely provide sufficient protection to the low-lying land (land depression) behind the foredune. For inundation hazard mapping, we have excluded these areas under protection of the foredune.
- Due to the continuous intact foredune with heights of approximately 5m, the only assets that may be impacted by this type of extreme water level on the open coastline are the vehicle access tracks and pedestrian beach access path to the swimming beach, as well as the areas they are connected to. We have identified small areas of low-lying land near the car park (ground level less than 1.8 m AHD) which have a potential risk of storm inundation. It is unlikely, but possible, that some storm water may reach these areas, together with rainwater, causing temporary localised inundation. As the vehicle access track heights are approximately equal to the maximum inundation level of 2.5m AHD it is unlikely the extent and impacts will be significant.

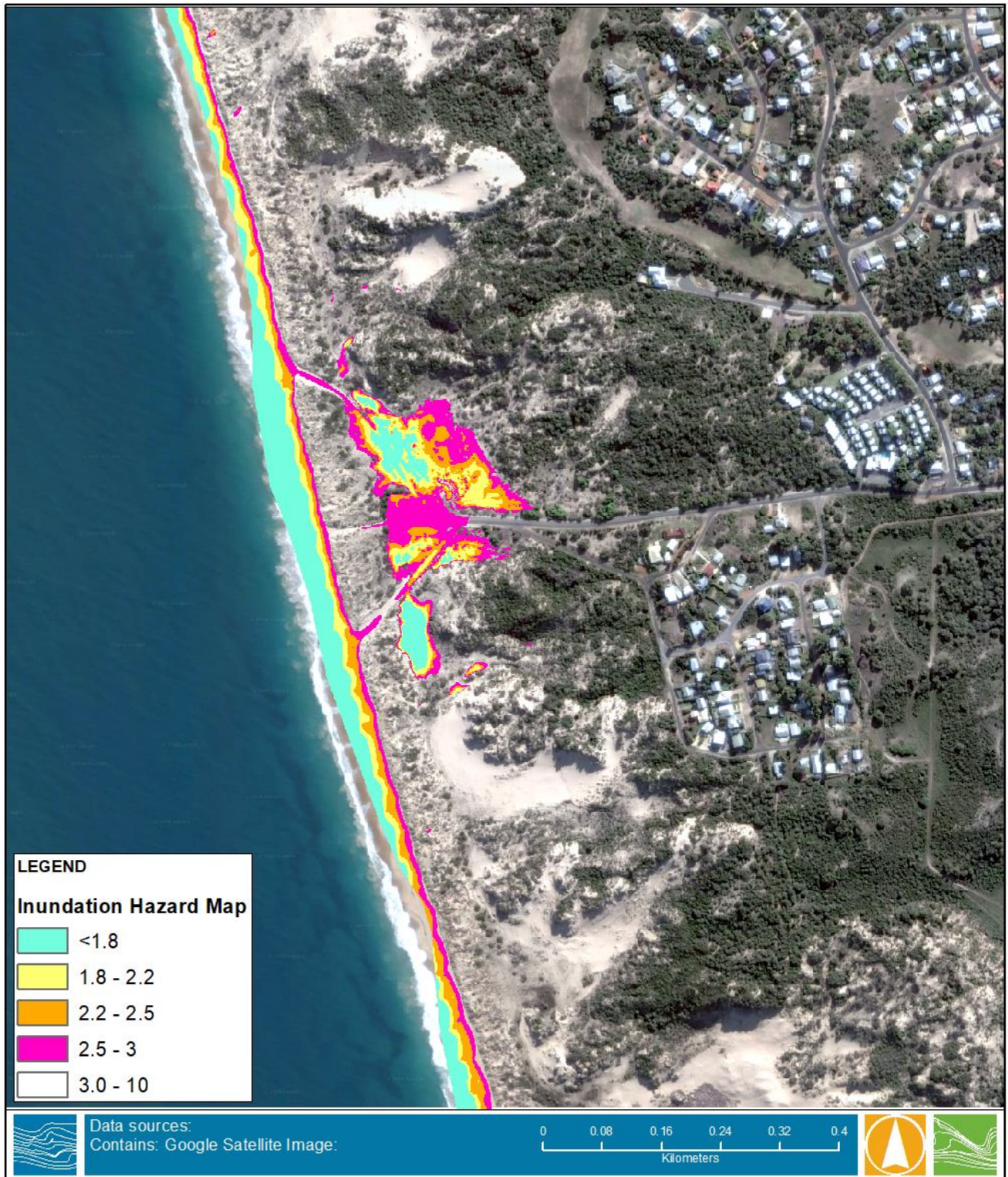
Overall, our assessment has shown very minimal inundation risk in next 10 years. The primary risk could be storm water runup through the vehicle access tracks and into the current green waste disposal site / car park. The probability of such event is very low in a 10-year planning period. It is possible that coastal inundation may be accelerated by coastal erosion, while such risk is also low in a 10-year planning period. The nature of severe

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storms means inundation of these areas is likely to be very short-lived – associated with the peak of a storm (minutes to hours) or even individual waves.

Attention should also be paid to rainfall accumulation which may adversely attribute to temporary flood of the low-lying land (light blue area showing in Figure 3-14). The sandy nature of the foreshore in general suggests that both temporary seawater and rainfall collections in low-lying areas will drain quickly as ocean storm surge levels decrease.



**FIGURE 3-14 INUNDATION HAZARD MAP DEPICTING GROUND LEVELS TO M AHD (2030)**

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## 4 SOCIAL AND CULTURAL ENVIRONMENT

### 4.1 Introduction

The foreshore reserve that is included in this Plan is made up of the part of the coastal environment that is experienced by residents and visitors when they visit the beach or get involved in activities adjacent to the beach. It includes the beach, the dunes, and the car park and access road as well as the facilities within this area.

The way people experience this reserve is the essence of the social and cultural environment. This section looks at the important elements of that interaction as well as the challenges and conflicts created through legislation, policy and use of the area.

### 4.2 Stakeholder and Community Engagement

The engagement undertaken by Water Technology to support the development of the Foreshore Management Plan has focussed on engagement during the process to incorporate the community's ideas and concerns, rather than only seeking comments at the end. A broad literature review, combined with specific engagement activities, enabled the social and cultural context to be considered when planning for management of the foreshore. To develop suitable engagement methods, a community profile was developed that identified characteristics of the local community. This data has been extracted from the 2016 Australian Bureau of Statistics *QuickStats* data (ABS, 2016) for both the suburb of Preston Beach, and the Waroona Shire LGA as a whole. Analysis is provided in Table 4-1.

**TABLE 4-1 COMMUNITY PROFILE**

Indicator	Preston Beach	Waroona Shire LGA
Population	227	4,148
Median Age	62	45
Ave Persons Per Household	1.9	2.5
Aboriginal and/or Torres Strait Islander people	8	101
Speaking English at Home	96.3%	83.5%
Work Full or Part Time	75.8%	82.4%
Total Dwellings	329	1903
Dwellings Occupied	30.4%	76.4%
Internet Accessed from Dwelling	74.5%	76.1%

A Community and Stakeholder Engagement Plan was prepared in July 2020 (7Appendix B). The plan identifies relevant stakeholders and the structure and pathways for their engagement. The plan was developed to be fit-for-purpose, and commensurate with the size and scope of the FMP – to avoid consultation fatigue within the community. The plan was prepared in accordance with the International Association of Public Participation (IAP2) Spectrum of Public Participation. The plan was prepared in accordance with the requirements of, and for consistency with, the following documents:

- *The Shire of Waroona (Draft) Strategic Community Plan 2030*
- *The International Association of Public Participation (IAP2) documentation*

The overarching objectives of the community and stakeholder engagement plan for the FMP are:



- Establish strong working relationships with community networks and stakeholders which are built on mutual trust and respect.
- To ensure all stakeholders have up to date information about the FMP, and the broader coastal management framework that supports the project.
- To provide the community and relevant stakeholders the opportunity to have direct input into the development and delivery of the FMP.
- To understand community goals and aspirations for the coastal zone and community views on values, assets, opportunities, and priorities.
- To aid in the identification of key issues and the selection of site-specific FMP management actions to address them. Stakeholders on the ground will have a knowledge of the site developed over years of interaction. This provides invaluable information that can be applied to generate innovative FMP measures.
- Increased community and stakeholder understanding of, and support for, actions and priorities in the FMP.

The plan details the program of engagement activities, including the following key components:

- **Community Workshop:** To understand the local community's values, and their perceptions of the key issues.
- **A Community Survey:** With similar objectives to Workshop #1, but to ensure that those who cannot make the workshop are provided an opportunity for engagement.
- **Drop-in Session:** To obtain feedback on the Draft FMP.

#### 4.2.1 Community and Stakeholder Engagement Workshop

The first community and stakeholder engagement workshop was facilitated on Thursday 3/12/2020 at the Preston Beach Community Centre. The event was well attended with approximately 33 community members and ratepayers participating. Water Technology delivered a presentation on the project including the coastal hazard assessment methodology and then a small group activity was carried out around four tables. Attendees were asked to use a questionnaire and aerial photo printouts to identify and prioritise relevant local information - primarily relating to their use of the foreshore, issues, and ideas. The workshop was a valuable opportunity for community members to raise issues and ideas and share their opinions amongst each other. One of the most important aspects of the evening was for attendees to hear first-hand the thoughts from other attendees, as opposed to reading results in a report or hearing them presented later on. A summary of the outputs is provided below:

Underlined – Raised by 5-10 people

**Bolded** - Raised by more than 10 people.

- When you visit the foreshore, which of the following activities do you engage in?
  - **Swimming**
  - **Four-wheel driving**
  - **Fishing (including crabbing)**
  - **Walking on beach**
  - **Dog walking/exercising**
  - Beach combing



- Use of green waste disposal area.
- General recreation/socialising – playing games, using playground, relaxing at sunset etc.
- Birdwatching
- Boating and water skiing
- Kayaking
- Photography
- Picnics / BBQs
- What issues are you most concerned about for the foreshore?
  - **Ablutions block – misuse/maintenance issues associated with increased demand and how campers might be using it (e.g., washing dishes, bathing )**
  - **Antisocial behaviour by four-wheel drivers on beach (speeding, hooning, parking on thoroughfare, not deflating tyres, driving onto/into foredunes, camping in dunes, campfires, driving through swimming beach area**
  - Foreshore degradation (mainly the foredunes within the swimming beach area, also sand build up on pedestrian access track and erosion scarps to foredunes, as well as dune blowouts and nuisance sand in general)
  - Disabled access to sandy beach area
  - Disabled access to a viewing platform/lookout over ocean
  - Poor Shire Ranger attendance
  - Concerned the beach could be closed to four wheel drives due to behaviour of minority.
  - Too many domestic and weed species left in green waste area.
  - Litter
  - Poor quality of beach for swimming safety
  - Children's playground insufficient
  - Weed species e.g., onion weed.
  - Hoon drivers on Mitchell Road.
  - The 3 different shires make it very difficult to have everyone on board to make decisions such as beach closures, regulating 4WD access/closures, COVID-19 travel restrictions.
- Do you have any ideas that should be considered during the review of the foreshore management plan?
  - **All-inclusive beach access – wheelchair access to sandy beach**
  - **Viewing platform/lookout/boardwalk to view sunset and look over ocean – with disabled access (a plan exists from a town resident, Doug Ellis from several years ago)**
  - **Upgrades to abluion block – possibly a camp kitchen.**
  - Caravan Park – generally supported but differing opinions on best location (proposed site very exposed)
  - Better long-term demarcation of swimming beach area to clearly restrict vehicles.
  - Additional pedestrian beach access paths – especially with any future development to north or south of town



- Upgrade to children’s playground – nature play and increased size.
- Permits for four-wheel drive use of beach (penalties for poor behaviour including not deflating tyres), via app, or pass or code.
- Increased attendance by Shire Rangers and Police (e.g., future “blitz” exercise on public holiday weekend)
- Increased Authority to Volunteer Rangers
- Increased shade areas to BBQ/park area
- Dual use path (pedestrians and bicycles etc)
- Public art – e.g., mural on ablution block wall
- Restrict four-wheel drive use of beach in winter.
- Provide better/more education and information regarding best practice for driving on beach.
- Facilitate increased ecotourism opportunities.
- Future land-backed Marina ~1km north of town
- Improved signage – consolidate and upgrade.
- Clear criteria for use of green waste disposal area
- Communal firepit, or seasonal town bonfire on the beach or with the car park
- Extend Preston Beach North Rd to create a new access road to the beach so to take some of the pressure of 4WD beach goers from going through the Town to just get to the beach and make beach access via the Town solely for pedestrians, not vehicles.

#### 4.2.2 Community Survey

In accordance with the Community and Stakeholder Engagement Plan, a community survey was prepared to source vital information on the community values of the local foreshore area. The aims of the survey were to obtain a snapshot of:

- How often locals visit the foreshore and what activities they engage in whilst there.
- What the local community considers to be the most important ecological, social, cultural, aesthetic, recreational, and economic values of the study area.
- Community perceptions of key issues and attitudes towards potential management options

The survey was developed as a central element of the community values assessment for the FMP. The survey was administered from the 20/11/2020 to 22/1/2021:

- Via a SurveyMonkey web link (that can be posted on the project website and/or social media
- Hard copies were distributed through the Progress Association and by the Shire, and made available at the General Store, Gold Club, and the Community Centre.

The survey was successful with high participation – 67 submissions were completed (66 digital and one hardcopy). In general terms the identified activities, concerns and ideas for the foreshore were very similar to the information collected at the workshop. Table 4-2 and the text below provides an overview of the survey results – 7Appendix C provides a complete summary of the results.





**TABLE 4-2 SURVEY RESULTS**

Question	Results	Notes
Q1 Where do you live?	<ul style="list-style-type: none"> <li>▪ Preston Beach – 30%</li> <li>▪ Perth – 50%</li> <li>▪ Other - 20%</li> </ul>	A majority of respondents were from Perth, likely due to high number of holiday houses, and survey being open over summer holidays.
Q2 How often do you visit the foreshore at Preston Beach?	<ul style="list-style-type: none"> <li>▪ Daily – 12%</li> <li>▪ Weekly – 24%</li> <li>▪ Monthly – 30%</li> <li>▪ Occasionally – 33%</li> <li>▪ Never – 0%</li> </ul>	Frequency makes sense given how many people come from out of town.
Q3 When you visit the foreshore, which of the following activities do you engage in?	<p>There were 11 options available with the top 5 most common being (in decreasing order):</p> <ul style="list-style-type: none"> <li>▪ Swimming</li> <li>▪ Four-wheel driving</li> <li>▪ Walking/Running/Exercise</li> <li>▪ Nature observation</li> <li>▪ Beach fishing</li> </ul>	
Q4 When you think about the foreshore, how important are the following values to you?	<p>In order of importance from highest to lowest:</p> <ul style="list-style-type: none"> <li>▪ Scenic amenity</li> <li>▪ Social/recreational amenity</li> <li>▪ Natural ecosystems</li> <li>▪ Economic values</li> <li>▪ Cultural values</li> </ul>	Natural environment is highly valued by community members and visitors alike.
Q5 What words or phrases would you use to describe what you like about the foreshore?	Focus was on quality of, and access to, the natural beach, including four-wheel drive access, relaxation and scenery, fishing, and recreation	See below for more detail
Q6 What issues are you most concerned about for the foreshore?	Many people raised concerns about fishing and four-wheel drives in swimming beach area; maintain four-wheel drive access; concerns about a minority of irresponsible four-wheel-drivers; littering	
Q7 Do you have any ideas that should be considered during the review of the Foreshore Management Plan?	Several people suggested ideas to improve issues with irresponsible four-wheel-drivers; refurbished signage; changes to car park layout and amenities including ablutions block and boardwalks/lookouts	

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Question	Results	Notes
Q8 Do you have any general comments about the foreshore and its management?	Approximately half of respondents did not have any additional comments. There were 10 responses expressing how they were happy or content with current facilities and management. Suggestions included: increased Ranger patrols and policing; more educational signage for four-wheel-drivers; suggestions around a caravan park or overnight stay area; foreshore amenity suggestions for car park area	
Q9 Finally, would you like to be kept updated on the Foreshore Management Plan?	65% of people requested to be kept informed.	

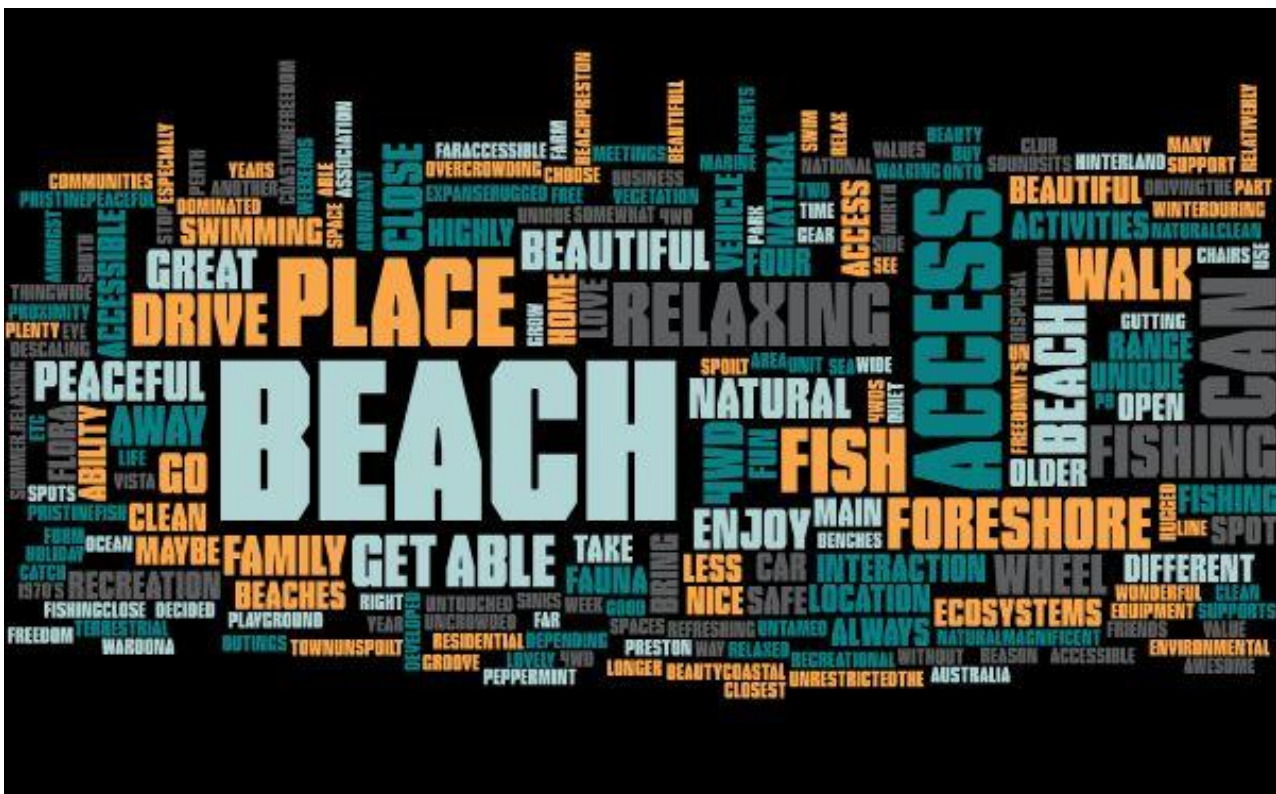


FIGURE 4-1 WORD CLOUD CREATED FROM THE RESPONSES TO SURVEY QUESTION 5 - WHAT WORDS OR PHRASES WOULD YOU USE TO DESCRIBE WHAT YOU LIKE ABOUT THE FORESHORE?

The results of the survey, in combination with the outputs from the workshop have informed the prioritisation of recommendations for the foreshore at the end of this document.

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### 4.2.3 Community and Stakeholder Drop-in Session

The draft FMP was out for public comment for several weeks. During this time, a second feedback survey was advertised by the Shire and a drop-in session was held on Saturday 17<sup>th</sup> July 2021 at the Preston Beach Community centre, where community members were able to ask questions of Water Technology and Shire staff and provide feedback. Approximately 30 people attended to review and discuss the draft FMP.

There were nine questions on the feedback form as follows:

1. Do you support the 16 recommendations in the draft plan?
2. Do you think any of the existing recommendations should be modified?
3. Are there any additional recommendations you would like to see included?
4. Do you agree with the priorities and timelines assigned to each recommendation?
5. During preliminary consultation a number of comments were raised regarding universal access to the beach; boardwalks and viewing platforms. Three alternatives are suggested. Which do you consider your priority?
  - a. Upgrading the existing lookout east of the car park
  - b. A new boardwalk along existing beach track at the car park
  - c. A new lookout in the foredune adjacent to the car park
6. Do you agree that Preston Beach would benefit from a tourist short stay caravan park? If so, which sites do you consider suitable?
  - a. Adjacent beach car park
  - b. Stables Road area
  - c. Hill St and Mitchell Road
  - d. South of Southern Road
  - e. Northern end of Panorama Drive
7. What do you consider the best approach to separating the swimming beach from 4WD access?
  - a. Tyres
  - b. Steel piles
  - c. An innovative design with shade
8. How likely are you to volunteer your time to assist with vegetation management, weed control and the replacement of dune supporting vegetation?
9. Do you have any other comments about the draft FMP?

Unfortunately, only six feedback forms were received, and some of these were only partially completed. Below is a summary of feedback received on the draft FMP in the form of six completed feedback forms:

1. Generally supportive
2. Two respondents suggested beach 4WD users need more education and improved recycling points are needed at the car park.
3. One respondent suggested a permit system for 4WD beach users and more consideration of a future boat harbour.
4. Generally supportive



5. The eastern lookout received two votes; a new boardwalk received three votes; and a lookout in the dune received 3 votes with some other general comments received supporting development of a lookout.
6. General support for a caravan park, with the Stables Road area the most popular
7. Tyres and consideration of an innovative shaded design were most popular
8. More support for volunteering than not volunteering
9. General supportive comments or information included from other questions.

### 4.3 Recreational Amenity

#### 4.3.1 Water Sports

A selection of water sports is presently undertaken within the study area including swimming, boating, water skiing, kayaking, diving, and fishing. The local nautical chart shows a small boating-prohibited area alongside the main beach access point – to complement the area’s use as a swimming beach. Discussions with local community members have identified that although the beach is used for swimming it is considered quite exposed throughout the year (to winter swells and summer seas) and is not a particularly family-friendly swimming beach.

#### 4.3.2 Vehicle Access, Roads and Car Parks

Car parking is available at the end of Mitchell Road, with nearby beach access tracks used by four-wheel drive and other off-road vehicles provided to the northern and southern sections. The car park includes a toilet block, playground, and associated foreshore amenities.

#### 4.3.3 4WD Beach Access

The provision of beach access tracks by the Shire is highly valued by the local community and visitors to the study area. It is a highlight of the study area but also a source of one of its biggest challenges. There are substantial concerns about the safety and environmental risks posed by a small minority of 4WD-ers who behave poorly.

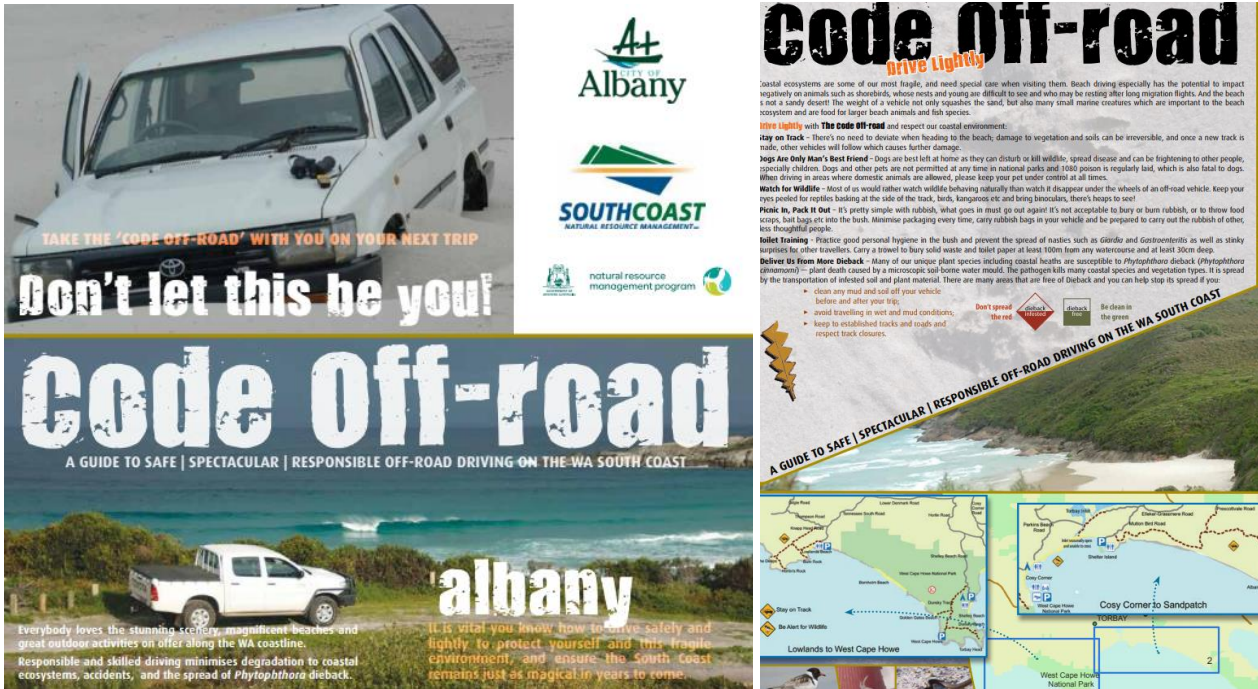
The Shire of Waroona are not alone in the challenges faced by poor driver behaviour on their beaches. Other LGAs known to have similar issues include:

- Shire of Gingin,
- Shire of Augusta-Margaret River,
- Shire of Manjimup,
- Shire of Denmark,
- Shire of Albany
- Shire of Esperance
- City of Mandurah (at time of writing the City is working to prepare a report considering vehicle beach access),
- Shire of Harvey

South Coast Natural Resource Management has partnered with several LGAs on the south coast to produce educational material for prospective beach drivers (South Coast NRM, 2020). Entitled “Code Off-Road” the maps provide information on local beach access and uses as well as educational information about 4WDing



in general and beach driving specifically (Figure 4-2). There is also an active 4WD club in the area – Peel 4x4 – who promote themselves as a local family friendly club.



**FIGURE 4-2 EXAMPLE PUBLICATION FROM SOUTH COAST NRM TO HELP EDUCATE 4WD USERS ON THE BEACH AT ALBANY**

Although there were several suggestions from the community to regulate beach vehicle use, e.g., registration for vehicle beach use, and installation of unmanned gates, registration points where people login or pay a fee these are not considered likely to be effective. The majority of well-behaved users are likely to react negatively. The minority which causes many of the issues are expected to vandalise equipment or avoid participating. It is considered more likely to be effective to continue to promote an educational strategy and promote passive surveillance from a wide network.

### 4.3.4 Boat Launching

Recreational boating is focused on boat ramps outside the study area, in Australind, Bunbury and Mandurah/Dawesville. These facilities in adjacent LGAs are considered adequate for the region for the foreseeable future. The beach access tracks at the townsite could be used to launch small boats directly from the beach, but only in calm weather, and this is acknowledged on the local nautical chart as a site for over-beach boat launching.

### 4.3.5 Pedestrian Access and Paths

Pedestrian access to the beach is provided at one location from the Mitchell Road car park. There is currently no universal access point. There is ongoing support for ensuring ongoing access to beaches and foreshore areas for all community members. The existing beach access path is heavily used by community members and visitors alike for various forms of recreation including, walking, swimming, beach combing, dog walking, sitting to appreciate the ocean view, fishing.

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Coastwise (2002) proposed additional pedestrian access paths be constructed but as the anticipated urban development did not proceed these paths have not come to fruition. Should further development occur to the north or south of existing town footprint, additional access can be considered.

The desire for universal beach access is not unique to the Preston Beach community, with several local governments and surf clubs recently trialing different options to provide it:

- The City of Stirling have recently trialed the temporary installation of matting onto the beach sand to provide access to the beach face for conventional wheelchairs (City of Stirling, 2021)
- The City of Bunbury installed a dedicated beach access ramp at Koombana Beach in 2017 as part of the foreshore redevelopment. The ramp provides access to the back of the beach and is complemented by beach matting from the ramp to the front of the beach. The City also provides free-hire of two wheelchairs designed to travel on the beach sand, and into the water (City of Bunbury 2021). The Cities of Wanneroo and Cockburn also have beach wheelchairs available for hire.
- Avoca Beach SLSC provides free-hire of different beach-terrain wheelchairs (such as the <https://www.sandcruiser.com.au/>) and matting which is installed on weekends (Have Wheelchair Will Travel, 2016). The Cities of Wanneroo and Cockburn also have temporary beach matting installed over winter months to improve wheelchair access to the sandy beach.

The medium to long-term effectiveness of these initiatives is still to be confirmed and it must be noted that most beaches where access has been provided by ramps or matting either have quite sheltered and low energy beaches or the matting is only deployed temporarily.

#### **4.3.6 Surf Club**

There are no Surf Lifesaving clubs within the study area. Given the regional location and usage of the swimming beach at the townsite it is unlikely that club facilities will be required or provided in the short to medium-term.

### **4.4 Heritage**

#### **4.4.1 Aboriginal Heritage**

Aboriginal connections and cultural values are likely to exist for the whole study area. Water Technology undertook a search of the State Government's Aboriginal Heritage Inquiry System (available at <https://www.dplh.wa.gov.au/ahis>) and no Registered Sites or Other Heritage Sites were identified within the study area. Water Technology also contacted the Waroona Aboriginal and Torres Strait Island Corporation seeking any additional information on Aboriginal heritage along the Shire's coast which may not be included in the state archives. Should any sites or information be identified in the future, appropriate methods of acknowledgement and recognition should be implemented.

#### **4.4.2 European Heritage**

WT undertook a search of the State Government's Heritage Register (available at <https://www.dplh.wa.gov.au/ahis>) and no sites were identified as being located within the study area.

#### **4.4.3 Maritime Heritage**

There are no known maritime heritage sites (such as shipwrecks) identified on the local nautical chart within the study area.



## 4.5 Land Management and Tenure

The land within the foreshore reserve is reserved under the Peel Region Scheme as Regional Open Space and managed by the Shire.

### 4.5.1 Existing Land Use and Zoning

The land within the coastal foreshore reserve includes parcels R41776, R32010, R33345 and R25659 (refer Figure 4-3) zoned as Regional Open Space. Adjacent land parcels in some locations comprise sections of the Yalgorup National Park managed by the Department of Biodiversity, Conservation and Attractions (DBCA).



**FIGURE 4-3 REGIONAL OPEN SPACE LAND PARCELS**

### 4.5.2 Existing Facilities

The existing developments within the study area primarily centre around the Mitchell Road car park with associated uses related to recreation and beach access including:

- Toilets

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- Car parking
- Foreshore amenities – playground, BBQs etc
- Pedestrian beach access path
- 4WD beach access

In addition, a lookout point is provided on the north side of Mitchell Road, approximately 250m back towards town from the car park, accessed via a short limestone path. Formalised in approximately 2013/2014 (based on Google Earth imagery) it comprises a basic bench seat, but provides a view to the horizon and open ocean over the car park and foredune (Figure 4-4)



**FIGURE 4-4 MITCHELL ROAD LOOKOUT PROVIDES A BENCH SEAT (L) AND COMMANDING VIEW OF THE FORESHORE AND OCEAN (R).**

### 4.5.3 Existing Management Activities

The Shire currently manages the foreshore and the assets within it by undertaking the following:

- Management of the toilet block and foreshore amenities associated with the car park. This includes maintenance, rubbish removal, cleaning.
- Coastal monitoring activities in collaboration with PNP and subcontractors – outlined earlier in this plan.
- Patrols by Shire Rangers of foreshore area and beaches.
- Support of the volunteer Ranger program
- Engagement of a contractor to spread donated green waste as foreshore brushing to demarcate foreshore vegetation, limit wind-blown sand and support enhancement of the coastal vegetation.
- Ad-hoc coastal revegetation programs depending on sourcing grant funding and support from community groups and members such as local schools.

The Volunteer Ranger program is supported by the Shire and staffed by volunteers who:

- Undertake regular patrols of the Shire coast.
- Focus on educating 4WD drivers on the beach of the need to take care of the environment and act responsibly whilst beach driving, particularly regarding driving at safe speeds.
- Work closely with the Shire Rangers, local Police and Preston Beach Volunteer Fire Brigade



#### 4.5.4 Landscape, Seascape and Visual Landscape

The Visual Landscape Planning manual (WAPC, 2007) provides advice for evaluation, assessment, siting, and design of development for the protection of views and vistas and natural landscapes. It includes advice on techniques for incorporating visual landscape planning into typical planning tasks. Pages 73-80 provide advice for visual landscape planning specifically for coastal landscapes. Natural visual elements for the Shire's coast are the coastal vegetation, dynamic beach and foredune, long unobstructed views from both beaches and dune ridges, and the high natural character value. Elements specific to development include siting and location, building design (colours, materials, height, reflectivity), parking areas, signage and entry statements, access and any vegetation clearing required. All of these shall be considered for any future coastal development within the foreshore reserve or adjacent coastal areas.

Landscape issues at the coast generally include degradation of natural landforms and vegetation, reduced visual access to the ocean (loss of views), visual dominance of built elements, the need for careful design and siting of foreshore infrastructure. The manual provides advice on how to minimise these impacts through appropriate design and scoping. The manual also provides guidance on the retention/restoration of natural landforms and vegetation and for the siting of foreshore infrastructure.

#### 4.5.5 Future Land Use and Potential Conflicts

There are currently no plans for substantial future development within the study area. The only documented current possibilities include foreshore amenities in the form of a boardwalk and universal coastal access, and the consideration of siting a future caravan park. Despite this, more substantial public development could be proposed in the future. Future land use within the foreshore reserve will need to meet several criteria, including:

- Form and scale of development appropriate for the zone – in accordance with the topography and visual landscape. Development of any public foreshore facilities shall be single storey and sit appropriately within the foreshore, rather than standing out from it.
- Foreshore tenure and management – any development must be suitable for regional open space.
- Location, form, and land use within coastal nodes – any development should be appropriate for the foreshore zone – i.e., coastally dependant and/or low-value or able to be removed when unacceptably vulnerable in the future.
- Stormwater and water sensitive urban design principles shall be utilised.
- Coastal hazard risk management and adaptation principles shall be considered in accordance with SPP2.6 and the coastal hazard risk areas identified in this plan.
- Financial responsibilities (capital and recurrent costs) for ongoing maintenance and management of foreshore areas – for development to be sustainable it must be able to be maintained within the Shire's operating budget.

Potential land use conflicts in the study area are low key and few, but include the following:

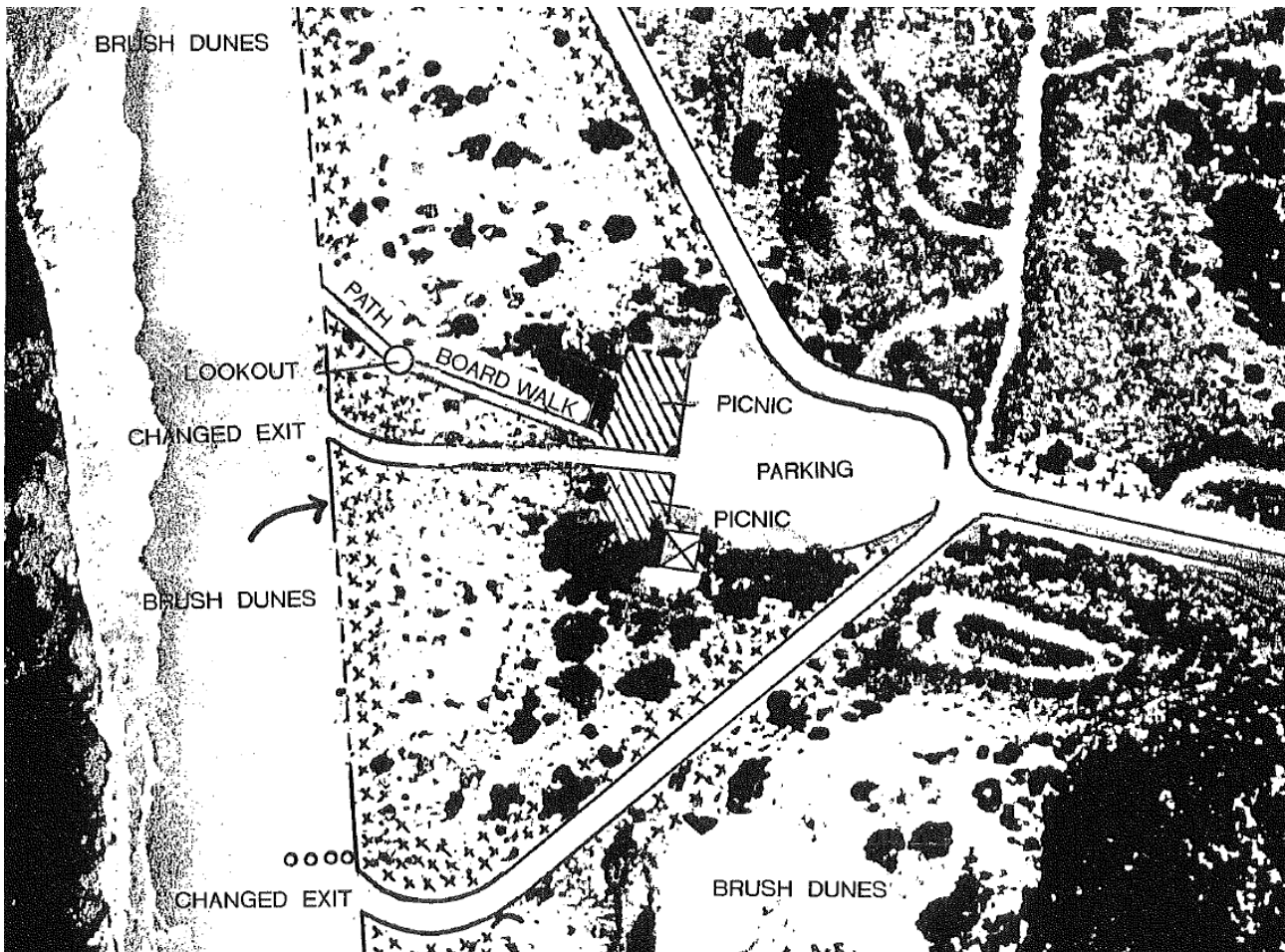
- Caravan Park feasibility (discussed in more detail below) will need to be in the public interest – e.g., offset vegetation clearing; if green waste disposal area is utilised then a replacement area may be required.
- Antisocial behaviour by minority of 4WD beach users is an ongoing concern to many community-members. The beach, and coast in general has always been a conflicted space with competing demands for quite different activities. This potential for safety issues and conflict will require ongoing management.

#### 4.5.6 Proposed Facilities

Coastwise (2002) documented a concept design for a boardwalk from the car park to the swimming beach (Figure 4-5). The boardwalk included a lookout point on the foredune crest. The proposed development was the result of community consultation for the FMP at the time and various requests for more convenient access



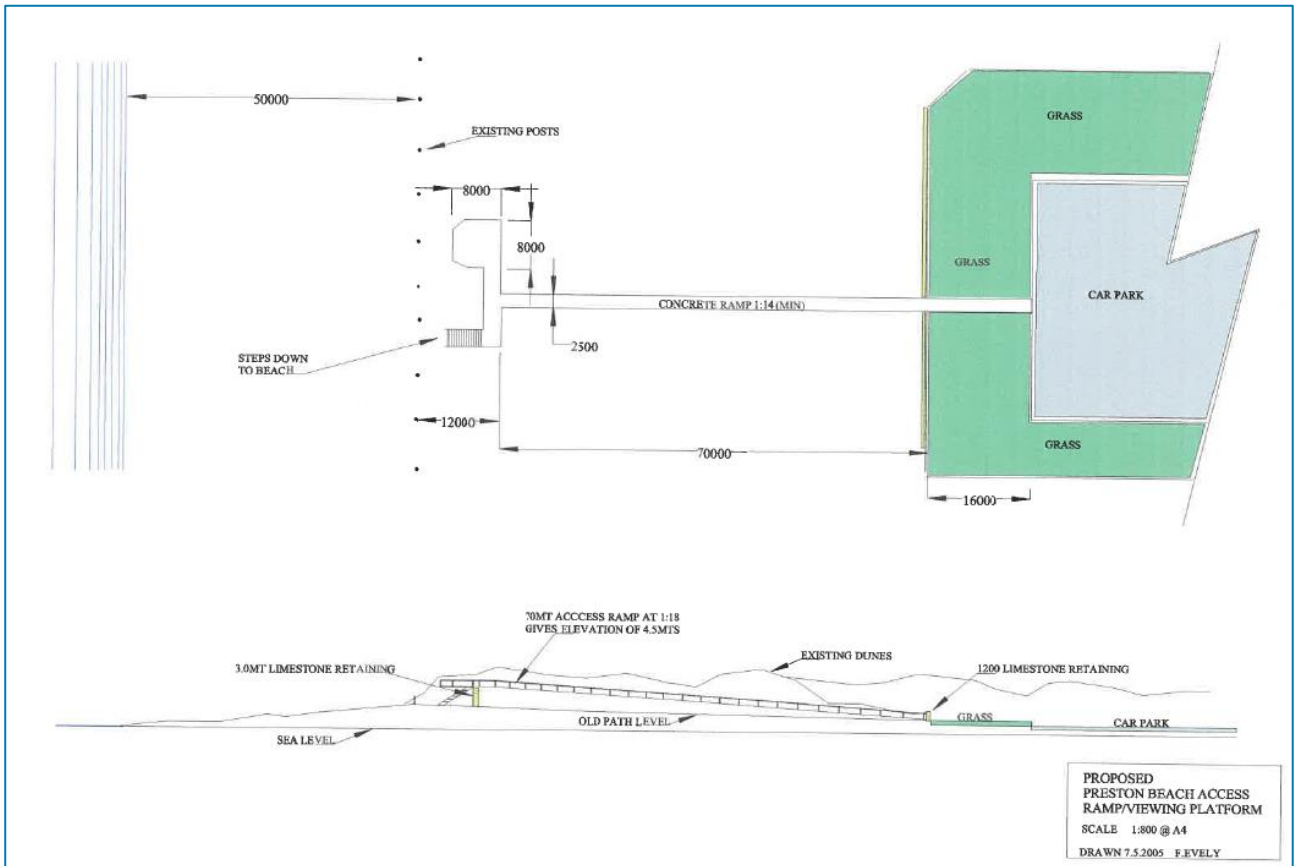
to the beach by community members and visitors that were frail or living with a disability. The design was not pursued as a priority for the Shire at the time.



**FIGURE 4-5 PROPOSED BOARDWALK AND LOOKOUT FROM 2002 FORESHORE MANAGEMENT PLAN (COASTWISE, 2002)**

In 2004 and 2005, local resident Doug Ellis sketched three concept designs for a boardwalk and viewing platform. Mr Ellis was a carpenter that worked extensively around Preston Beach. Figure 4-6 to Figure 4-8 show the three different designs that were proposed. All three concepts feature a boardwalk from the car park through to a viewing platform in the foredune. Variations between the design include the construction material (concrete vs timber), boardwalk/path alignment (same position as pedestrian access path and replacing it or through dunes to its north). It is understood that local community members were supportive of the concepts, but a final design was not endorsed to be progressed further at the time.

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**FIGURE 4-6 CONCEPT BOARDWALK AND VIEWING PLATFORM DESIGN DATED MAY 2005 UNDERSTOOD TO HAVE BEEN INITIALLY SKETCHED BY DOUG ELLIS**

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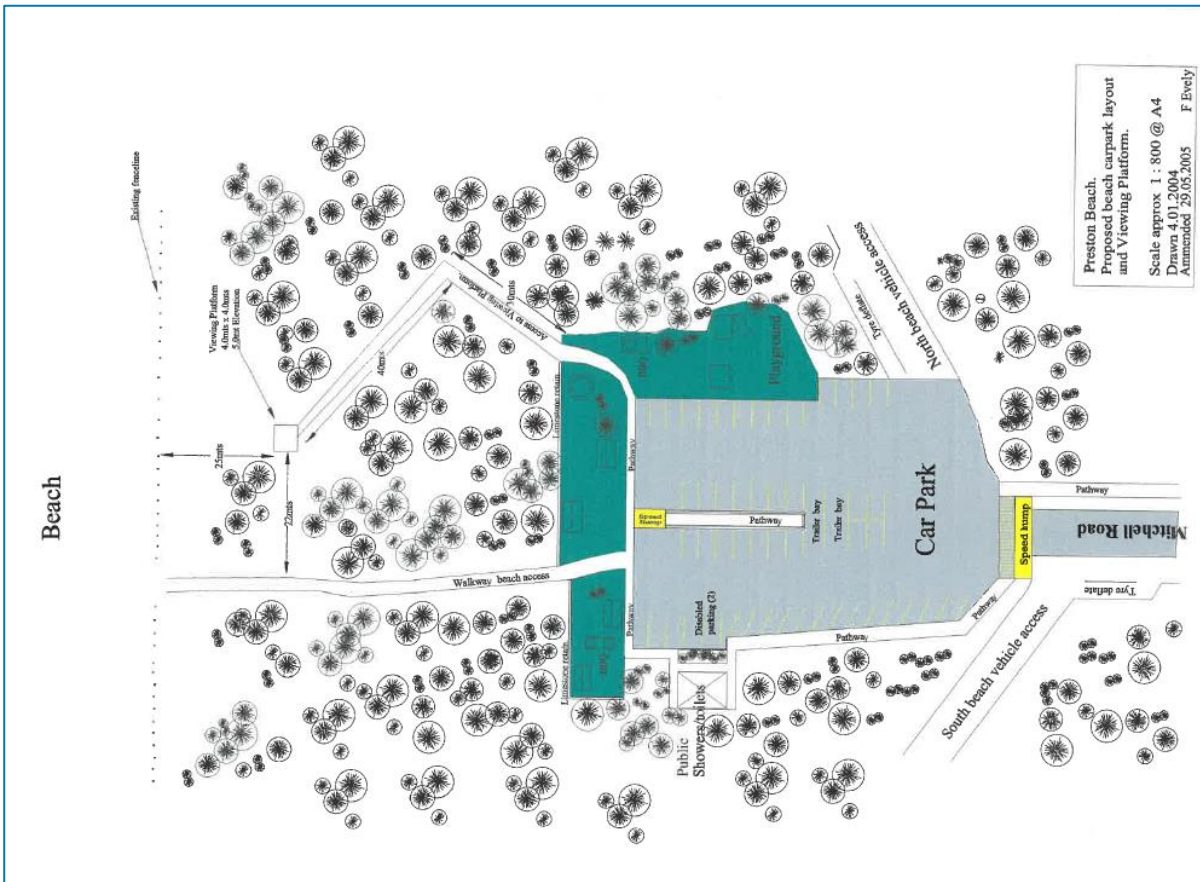
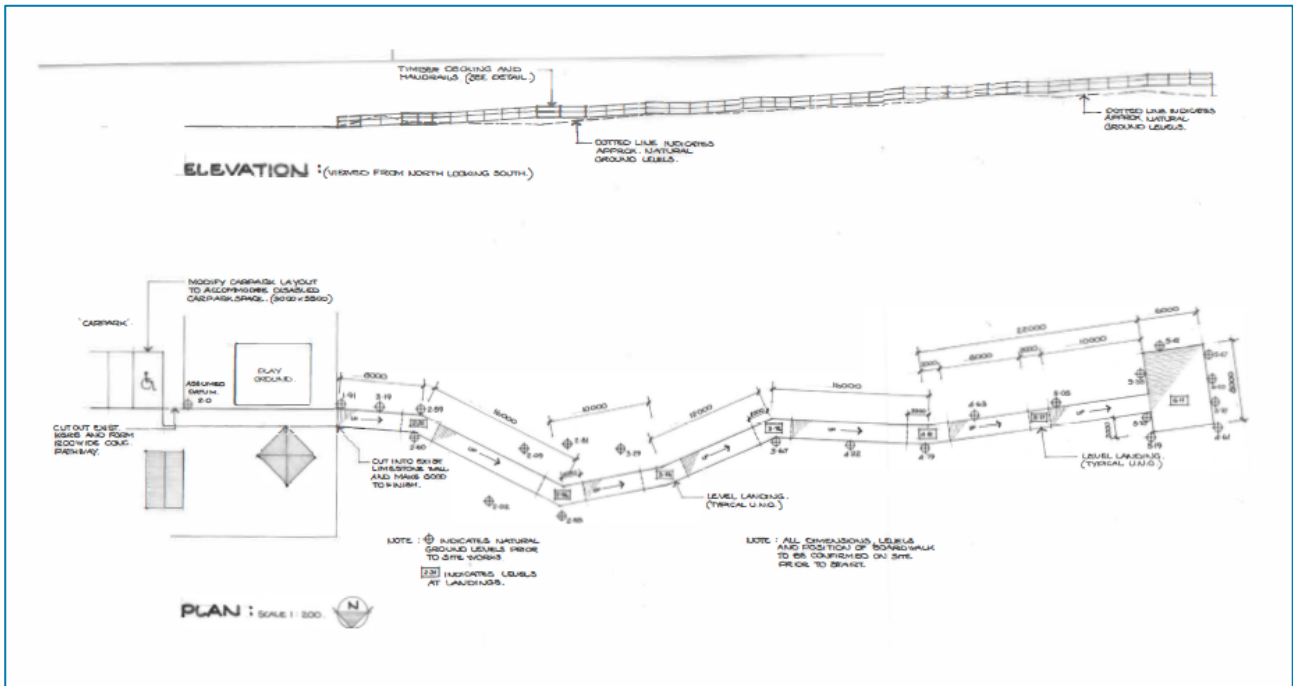


FIGURE 4-7 CONCEPT BOARDWALK AND VIEWING PLATFORM DESIGN DATED MAY 2005 UNDERSTOOD TO HAVE BEEN INITIALLY SKETCHED BY DOUG ELLIS

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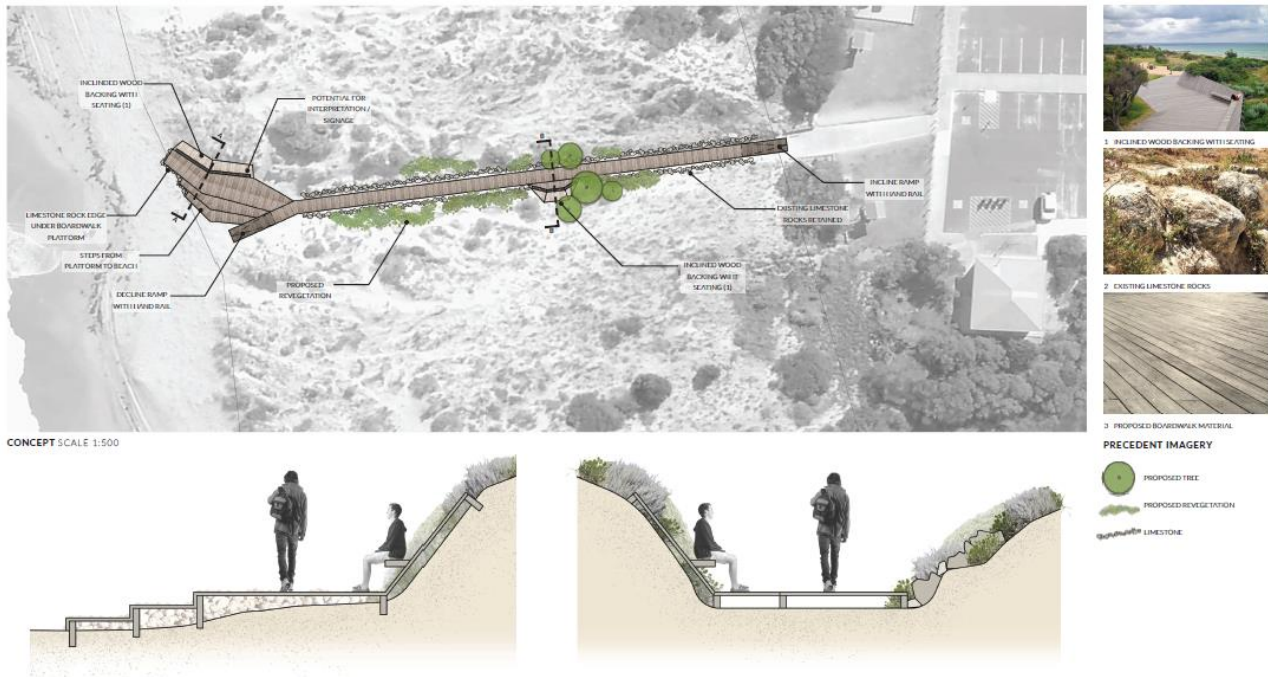
**FIGURE 4-8 CONCEPT BOARDWALK AND VIEWING PLATFORM DESIGN. DATE UNKNOWN. UNDERSTOOD TO HAVE BEEN INITIALLY SKETCHED BY DOUG ELLIS**

During the community consultation associated with the preparation of the Community Strategic Plan, the overall Waroona community identified the need to provide additional tourist attractions such as boardwalks.

The Preston Beach community also identified the need to improve access to the beach. It was considered that the construction of a universal access boardwalk would further enhance the local community and tourist experience in Preston Beach. Because of the strong community support to provide improved access to the beach, a consultant was engaged by the Shire in 2020 to provide a concept plan for a boardwalk that would provide access to the beach for disabled and ambient members of the community as well as tourists / visitors to Preston Beach (Figure 4-9). Important features of the design brief included:

- The Shire has a large older demographic which struggle to be able to access the beach due to physical restrictions. The construction of a disabled / ambulant friendly boardwalk will give this demographic the ability to access the beach.
- The environment, especially the dunes in Preston Beach, are susceptible to damage not only from storm surges but also from public traversing through the dunes. The provision of a dedicated access boardwalk will go a long way to alleviate public walking through the dunes. Disabled / ambient friendly boardwalk providing access to the beach will encourage both the local community and visitors that can otherwise not access a beach to visit Preston Beach.
- The attraction of additional visitors to Preston Beach would assist in the economic viability of the existing businesses in the area.
- The design of the boardwalk was to take into consideration the existing natural environment and not affect the existing dunes. The consultant's final design concept provides for disabled / ambient access to the beach as well as viewing platform with seating. It is also proposed to revegetate the areas alongside the boardwalk with indigenous flora.

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**FIGURE 4-9 CONCEPT DESIGN FOR A UNIVERSAL ACCESS BOARDWALK FROM THE CAR PARK TO THE SANDY BEACH (ECOSCAPE, 2020)**

Council resolved to consider this design in conjunction with the work undertaken as part of the FMP review and update, and to consider the likely capital and maintenance costs associated with the concept.

Water Technology have briefly reviewed this concept design, and despite the relative stability of this section of coast, it is considered highly vulnerable to storm damage by erosion of foundations and direct wave impact in severe events. Storms of medium severity in the southwest region caused significant beach erosion and damage to some coastal structures – such as the Dalyellup Beach access stairs (Figure 4-10). Similar damage would be likely to the proposed beach lookout/access area in the proposed design in its current form. It is suggested any universal beach access has a minimal footprint at the beach end to offset the risk of damage and cost to rebuild. It is likely to be more appropriate to separate the desired functions of universal beach access, and a lookout for ocean/sunset vistas.

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**FIGURE 4-10 DALYELLUP BEACH ACCESS STAIRS DAMAGED IN WINTER 2020 STORMS (COASTSNAPWA VIA UWA, 2020).**

Discussions at the December 2020 community engagement workshop identified that there are several functions/assets that are desired by community members and they may not all need to be provided in one location by one facility. These include:

- Universal access to sandy beach area
- Provision of a lookout facility to provide uninterrupted ocean views from close to the water - maybe with or without universal access, but suitable for frail/elderly community members/visitors.
- Provision of a lookout facility to provide sunset vistas, could be back from beach, rather than providing uninterrupted ocean views - maybe with or without universal access, but suitable for frail/elderly community members/visitors.

The outcome of the drop-in session and Shire feedback forms was a preference for a universal accessible lookout in the foredune or a boardwalk on the existing pedestrian access path. The number of respondents was very small (six); and the Shire currently has \$100K of State funds committed for the purpose of providing universal access to the sandy beach.

#### **4.5.7 Caravan Park Feasibility**

As part of the scope of works for preparation of this FMP the feasibility of the establishment of a caravan park at Preston Beach was considered, with particular reference to land parcel R32010 (Figure 4-11).

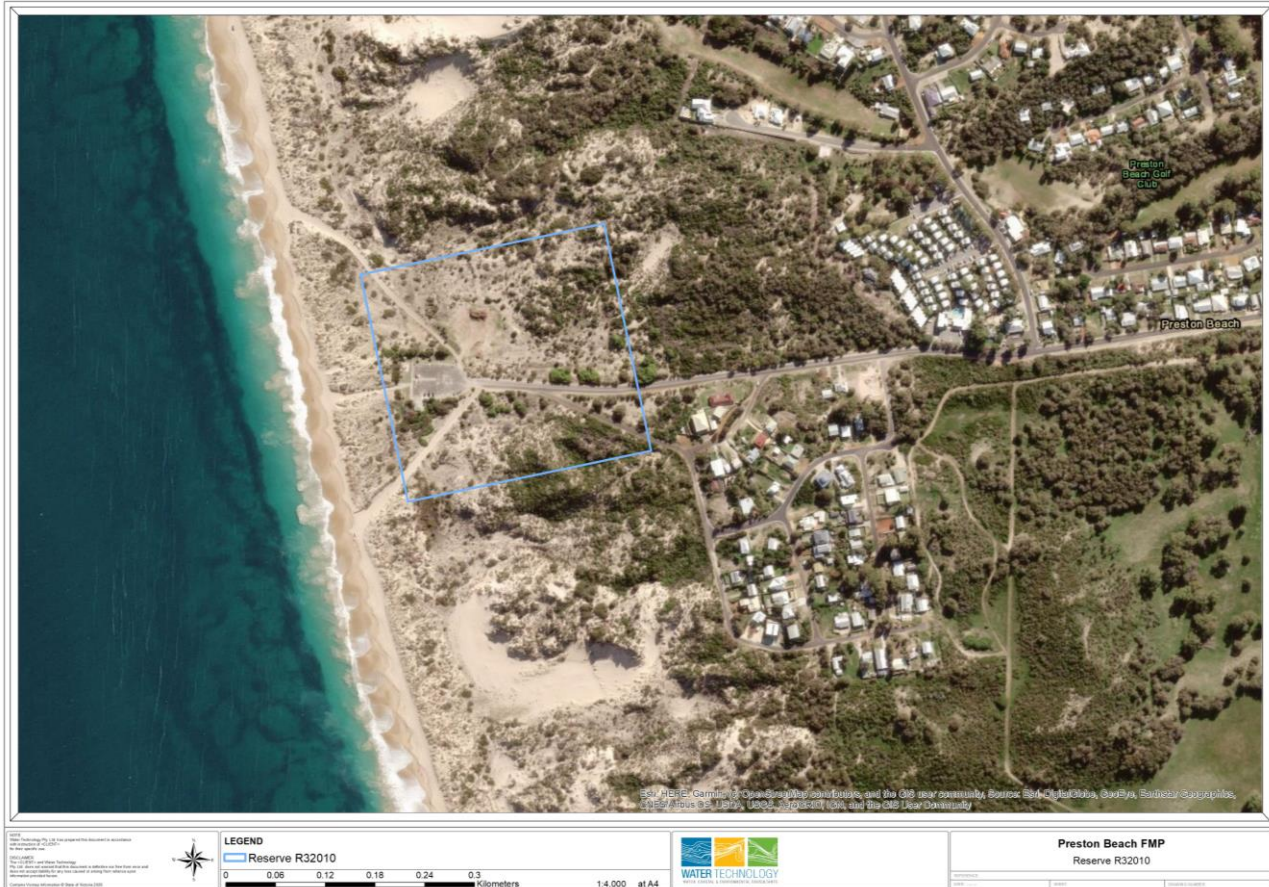
The erosion and inundation hazard risk has been assessed and found land parcel R32010 is unlikely to be subject to erosion for several decades. Depending on how the shoreline responds in coming decades, occasional inundation could impact the parcel sooner (i.e., once the protective foredunes are largely eroded). These erosion and inundation risks are of no particular concern because the shape and location of land parcel

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R32010 means the most accessible and suitable area for a caravan park is in the northeast corner (relatively flat, least risk of coastal hazards) – landward of the car park and amenities. This means any erosion or inundation risk would need to be addressed for these assets initially anyway before the caravan park.



**FIGURE 4-11 LOCATION OF COASTAL FORESHORE RESERVE 32010 OF THE PRESTON BEACH TOWNSITE**

Following discussions at the December 2020 community workshop, several other potential issues with the location were identified, including:

- Exposure to prevailing south-westerly sea breeze winds. These are likely to be a nuisance for caravan park clients, given the increased vulnerability of their temporary accommodation to strong winds (such as tents, camper trailers and caravan annexes). Potential mitigation options could include significant earthworks such as bunding to provide windbreaks, or construction of wind proof fencing around and within the development – but these are likely to represent a significant cost.
- Potential land-use conflict as the area is currently used as the green waste disposal area. Potential mitigation options include minimising the footprint of the green waste disposal area or relocating it by clearing another foredune area – but similar works would be required to locate a caravan park elsewhere, so there would not be a net benefit.
- Community members have advised the local swimming beach is often exposed to quite high energy ocean conditions throughout the year (to winter swells and summer seas) and is not a particularly family-friendly swimming beach. Locating a caravan park adjacent to this beach may create the expectation that it is ideally suited for use by families. Potential mitigation options could include a signage/education program to clearly explain the risks/character of the beach to prospective clients. Locating the caravan park

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elsewhere in town may only slightly address this issue as the only designated beach access is still at Mitchell Road and the beach conditions are similar along the study area.

Following review of the details, Water Technology considers the site is not overly suitable for establishment of the area as a caravan park and that other sites around town should be considered. Discussions at the December 2020 community workshop identified several other potential locations:

- South or west of Stables Road within the reserve
- East of Hill Street and south of Mitchell Road in the rural-zone land
- South of Southern Road within the reserve
- At the northern end of Panorama Drive in combination with any future development of the urban-zoned land

All these sites are likely to have several challenges, including those associated with tenure and zoning, but are likely to provide sheltered locations more suitable for establishing a caravan park.



## 5 ENVIRONMENTAL CONTEXT

### 5.1 Bioregion

The appreciation of the natural environment in the study area by the community members and visitors is clear from the outcomes of the engagement activities. The preservation of natural assets such as sand dunes and foreshore vegetation is strongly supported.

The Shire coastline provides an excellent environment for residents and visitors to enjoy recreational activities and natural areas. It is characterised by white sandy beaches and coastal heathland vegetation and includes significant sand dune formations (the Quindalup dune system) occurring as prominent primary dunes.

The vegetation communities within the Shire are typical of coastal areas, which are homogeneous at a broad scale but vary considerably on closer inspection depending on the age of the dune, dune stability and external influences from disturbance such as weeds, fire, and other anthropogenic influences. The vegetation communities, significant flora and environmental hazards and threats along the coastline of the study area are described below.

The study area is in the Swan Coastal Plain IBRA bioregion. This bioregion is a 30 km wide coastal plain on the Indian Ocean coast directly west of the Darling Scarp uplands running from Cape Naturaliste in the south to north of Perth. The area generally consists of infertile sandy soil along with coastal sand dunes, river estuaries, and several wetlands kept back from the sea by the dunes.

The sediments of the Perth Basin are Tertiary and Quaternary in age immediately below Perth and include coquina, travertine, and sandy limestones with abundant shelly material. Offshore, the sand dune system and surficial deposits transition into a system of partly eroded limestones and sandy limestones. These form a series of drowned cuestas which today form submerged reefs. The dune topology also results in extensive north-to-south-oriented chains of wetlands, again located in the swales. For example, the chain of lakes/estuaries between Bunbury and Mandurah.

Water Technology undertook a search of the Federal Government's Protected Matters Search Tool (Department of Environment (DoE), 2021; available at <https://www.environment.gov.au/epbc/protected-matters-search-tool>). The Peel-Yalgorup system is identified as a wetland of international significance and important to the study because of its proximity. Two ecological communities are listed as threatened, the Banksia Woodlands and Tuart Woodlands and Forests, of the Swan Coastal Plain.

### 5.2 Bushfire Risk

WT liaised with DPLH regarding bushfire risk in the study area (pers comm J. Holm 27/10/2020) who advised that the State requirements are presented in *SPP3.7 – Planning in Bushfire Prone Areas* and the associated documents. There is no explicit requirement for an LGA to undertake specialised bushfire risk assessments for their foreshore land parcels, such as those reserves in the study area. Requirements are, however, triggered by planning and development applications in Bushfire Prone Areas, for habitable buildings, or strategic planning proposals which will result in an intensification of land use; and could result in the requirement for a bushfire management plan. Most of the foreshore study area (and Shire as a whole) falls within a zone designated as bushfire prone by the State (DFES, 2021).

### 5.3 Yalgorup National Park

The study area is bordered in several locations by Yalgorup National Park. The park is the largest national park on the Swan Coastal Plain and is known for its elongated lakes, beautiful tuart, peppermint woodlands and above all, the microscopic communities that reside in Lake Clifton and form thrombolites. This is one of few places in Western Australia where these communities survive.



The park covers an area of 12,888 hectares and includes ten lakes. It protects a wetland system that has achieved international recognition as an important area for migratory waterbirds, and it supports several threatened plant and animal species (DPAW, 2021).

The Yalgorup lake system is significant for waterbirds and is recognised under the international Ramsar Convention. The lakes provide important habitat for the migrating wader birds from the northern hemisphere. These waders include the bar-tailed godwit, red-necked stint, greenshank, red knot, whimbrel and three species of sandpiper. Other waterbirds that use the lakes include the banded and black-winged stilts, red-necked avocet, hooded and red-capped plovers, Australian pelican, and coot. Surveys show that the Yalgorup lakes support high numbers of musk ducks, Pacific black ducks, black swans and shelducks. The quacking frog, turtle frog and slender tree frog are among the eight frog species that inhabit the park, and the long-necked oblong turtle is present in Lake Clifton (DPAW, 2013).

Any future development in the study area or reserves adjacent to the national park shall require consideration of the park's natural values.

## 5.4 Vegetation Communities and Condition

The Protected Matters Search Tool for the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 lists two plants as Vulnerable in the study area (Dwarf Bee-Orchid and Dwarf Hammer-orchid) and none as Endangered or Critically Endangered (7Appendix D). The two ecological communities listed as threatened are summarised below.

### 5.4.1 Banksia Woodland

The ecological community is a woodland associated with the Swan Coastal Plain of southwest Western Australia. A key diagnostic feature is a prominent tree layer of Banksia, with scattered eucalypts and other tree species often present among or emerging above the Banksia canopy. The understorey is a species rich mix of sclerophyllous shrubs, graminoids and forbs. The ecological community is characterised by a high endemism and considerable localised variation in species composition across its range (DoE, 2021).

### 5.4.2 Tuart Woodlands and Forests

The ecological community occurs as woodlands or forests or other structural forms where the primary defining feature is the presence of Tuart (*Eucalyptus gomphocephala*) trees in the uppermost canopy layer. The name of this tree species reflects one of its various Noongar names. The ecological community includes the assemblage of plants, animals and other organisms that occur in association with Tuart. The ecological community has a discontinuous distribution in the west of the Swan Coastal Plain, of southwest Western Australia (DoE, 2021).

## 5.5 Fauna Species and Habitat

Fauna habitats, and their distribution, are influenced by exposure, topography, geomorphology, soil depth, vegetation communities and extent of disturbance by humans. As a result, fauna habitats are diverse, and an array of fauna types are present.

Historical surveys of the fauna of the Swan Coastal Plain have recorded a variety of reptiles, amphibians, mammals, and birds. Particularly well represented in the foreshore zones are reptiles. Birds are also prevalent in the section due to the diversity of habitats available.

NatureMap indicates that 58 fauna species have been recorded in this section in surveys registered with the Western Australian Museum (DBCA, 2021). Five species listed as having Priority 4 status in WA or being "rare or likely to become extinct" are listed below:

- Carnaby's Cockatoo (Rare or likely to become extinct)



- Baudin's Cockatoo (Rare or likely to become extinct)
- Atlantic Yellow-nosed Albatross (Rare or likely to become extinct)
- Hooded Plover (Priority 4)
- Graceful Sunmoth (Priority 4)

The Protected Matters Search Tool for the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 lists several other threatened species which may occur in the section, or for which habitat may occur. A summary is presented in Table 5-1 and the report is available as 7Appendix D.

**TABLE 5-1 NUMBER OF FAUNA SPECIES LISTED UNDER EPBC ACT IN STUDY AREA FOR VARIOUS CATEGORIES**

Group	Vulnerable	Endangered	Critically Endangered
Birds	12	10	3
Mammals	2	3	1
Plants	2	0	0
Reptiles	2	2	0
Sharks	3	0	0
Migratory marine birds	6	5	0
Migratory marine species	5	4	0
Migratory Terrestrial species	0	0	0
Migratory wetland species	0	1	2

## 5.6 Environmental Hazards and Threats

There are several environmental hazards and threats which apply to the study area. These include feral animals, weeds, plant pathogens, bushfire, uncontrolled access, lack of awareness and climate change.

### 5.6.1 Feral animals

Feral animals are a key threat to biodiversity in Western Australia causing a decline in native species populations due to changes to competition, predation, mortality, or habitat degradation.

Several species of feral animals are known, or likely to be present in the study area (DoE, 2021). These include Cat (*Felis catus*), European Red Fox (*Vulpes vulpes*), Rabbit (*Oryctolagus cuniculus*), Domestic Dog (*Canis familiaris*), House Mouse (*Mus musculus*), Black Rat (*Rattus rattus*), Pig (*Sus scrofa*) and seven bird species.

The feral rodents, House Mouse, and Black Rat are ubiquitous species commonly associated with human settlement. Feral cats and foxes are predators of a wide range of small native animals, including birds, mammals, frogs, and reptiles. The European Rabbit poses a significant threat to the germination of seedlings, particularly after bushfires (Ecoscape 2004).

### 5.6.2 Weeds

Several introduced (weed) species have been identified in the study area. Weeds often invade native vegetation and subsequently have negative impacts on the biodiversity of flora and fauna, fire management regimes, dune stability and erosion. Weeds often respond positively and rapidly to land or habitat disturbance,

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such as clearing, rubbish dumping, trampling and fire. Weeds create several issues for biodiversity within the study area including (360 Environmental, nd.):

- Competition with native vegetation by inhibiting growth, seedling recruitment and displacing native species.
- Replacement of diverse native plant communities with more uniform weed communities
- Changing the structure of vegetation communities, often by the removal of the shrub layer or native ground covers.
- Changing nutrient cycling of native communities
- Altering soil acidity
- Altering geomorphic processes, such as increased or decreased erosion
- Weeds may increase bushfire risk.
- Reducing resources available for fauna by altering the habitat
- Loss of species and genetic diversity
- Some weeds are poisonous to native fauna.

The introduction and spread of weed species or diseases has the potential to occur through several means, particularly associated with spread from vehicles and machinery. The key activities which may result in the introduction and spread of weed and diseases include:

- Movement of vehicles, machinery and people along tracks, roads, beaches or in intact bushland
- Importation of material containing weeds or diseases may cause introduction of new diseases or weed infestations to the study area.

Following discussions at the December 2020 community workshop it was also identified that there are concerns domestic plants may become established within the foreshore vegetation if viable seed is deposited in the green waste disposal area near the car park to be used for foredune brushing.

### 5.6.3 Pathogens

Plant pathogens such as Phytophthora (*Phytophthora cinnamomi*), Honey Fungus (*Armillaria luteobalbina*) and Cankers also have the potential to threaten the integrity of the native vegetation in the study area.

While there is no evidence of these pathogens in the study area, and the coastal soils are not particularly favourable for Phytophthora, steps should be taken to ensure that infection does not occur, particularly during development or rehabilitation activities. It is important to practice soil hygiene; for example, ensuring that any soil brought in during construction or landscaping is not from an infected area. Infected soil can be moved around on vehicles or bikes, footwear, animal movements, road construction and earth moving equipment.

### 5.6.4 Lack of Awareness

Knowledge and awareness of local biodiversity within the community is critical to improving behaviours and attitudes towards the natural environment and reducing damage due from people's activities. The Shire has an important role in promoting environmental awareness, engaging, and educating the community in biodiversity conservation.

### 5.6.5 Uncontrolled Access

Uncontrolled access to natural areas for recreational activities such as trail bike riding and four-wheel driving are a threat to the native flora, fauna, and habitats in the study area. Primarily people use vehicles along the



beach for transport and recreational purposes which can risk causing damage to the foreshore. Whilst not currently a significant issue, uncontrolled pedestrian access within foredune areas can lead to trampling of vegetation, disturbance of soil surfaces leading to erosion and reduction in aesthetic values.

### **5.6.6 Climate change**

Climate change is a threat to biodiversity within the study area. The southwest of Western Australia is becoming a hotter and drier climate with more frequent and severe bushfires and extreme weather events. Drought months are predicted to increase, and seasonal rainfall decline will continue to intensify. The impacts of climate change on biodiversity include:

- Reduced water availability in wetlands and other groundwater dependant ecosystems, and deterioration of water quality causing negative ecological impacts.
- Changes to wildlife migration patterns
- Changes to critical seasonal timing of reproduction
- Movement of species to areas of adequate rainfall causing a reduction in local biodiversity.
- Damage to natural areas causing hazards for wildlife.
- Erosion and inundation of sensitive dune ecosystems threatening coastal biodiversity (360 Environmental nd).



## 6 IMPLEMENTATION PLAN

### 6.1 Management Action Summary

A summary of recommended management actions is provided for the study area in Table 6-1 below. Indicative timeframes for implementing the actions are provided, along with suggested prioritisation (high, medium, low). Concept cost estimates for budgeting purposes are also provided. Estimates are a combination of expected capital and ongoing costs over the 10-year planning period for each action. Please note quotes have not been obtained and costs are based on Water Technology's experience with similar coastal projects and represent an opinion of potential cost.

### 6.2 Monitoring and Review of Foreshore Management Plan

The management actions outlined above should be planned to be implemented by 2030. As such, monitoring and reporting by Shire staff to Council should occur approximately once per year to provide updates on the status of the actions to ensure they remain current, and resourced. This FMP should be reviewed and updated by 2030 or if necessary, should any of the following occur:

- Significant coastal erosion or inundation in line with a 100-year ARI event or similar (i.e., only likely to occur every few decades).
- Overarching planning documents such the Peel Region Scheme or Local Planning Scheme are amended with changes that directly affect the foreshore zone. This may also include any expansions of town to the north or south.
- Coastal Monitoring Data, currently being collected, indicates changes occurring to the coast which are drastically different to the coastal hazard risk processes and areas defined in this report.





**TABLE 6-1 RECOMMENDED FORESHORE MANAGEMENT ACTIONS**

#	Management Action	Timeframe & Priority	Indicative Cost
1	Continue to provide beach access for vehicles to the north and south of the swimming beach and prohibit vehicle access to the swimming beach	Continuous High	Less than \$25,000
2	Continue to restrict access to the foredune. Current policies of education, monitoring by Volunteer and Shire Rangers, demarcation of access tracks and pedestrian paths and foredune brushing should continue to ensure informal access into the vegetated foredune is minimised as much as possible to protect the condition of the foredunes and vegetation	Continuous High	Less than \$25,000
3	Continue brushing of foredunes with donated green waste but provide advice on what green waste is suitable for foredune brushing and welcome at the green waste disposal area and what is considered weeds and is prohibited to be deposited.	Continuous High	Less than \$25,000
4	Continue to undertake and support programs for the eradication of weeds and the rehabilitation and revegetation within the foreshore reserves. Appropriate local species should be used. <ul style="list-style-type: none"> <li>▪ Works near the car park could be enhanced by descriptive signage to provide education and tell the story of the natural flora and fauna for the various locations.</li> <li>▪ Input from DBCA, Peel Harvey Catchment Council and the Peel Harvey Biosecurity Group should be sought for vegetation condition inspection, the eradication of weeds, and rehabilitation and revegetation activities.</li> </ul>	Continuous Medium	Less than \$25,000
5	Continue coastal monitoring activities to characterise the behaviour of the coastline in the study area. This background information will be valuable in the event of severe storm damage (where beach surveys should be undertaken ASAP after such an event) or for future coastal planning and development applications to ensure sustainable management of the coast into the future. Collaborative efforts such as these being undertaken with the PNP are appropriate for the Shire, given the coast is largely undeveloped and contains no coastal erosion hotspots.	Continuous Medium	Less than \$25,000
6	Pursue grant funding opportunities from state and federal government to assist with the implementation of these recommendations.	Continuous Medium	Less than \$25,000  Intent is zero net cost assuming successful grants

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#	Management Action	Timeframe & Priority	Indicative Cost
7	<p>Review options to permanently demarcate swimming beach from 4WDing and fishing beaches either side. Options to consider include:</p> <ul style="list-style-type: none"> <li>▪ Installing large steel piles, driven into sand, or placed in drilled holes if there is limestone bedrock (understood to be present near 0.0 mAHD on parts of the swimming beach.</li> <li>▪ Another option is “jettable” smaller steel posts which are installed by pumping large volumes of water down them to fluidise the sand.</li> <li>▪ A possible innovative design could include the provision of beach shade attached to the piles, or able to be temporarily attached for school/summer holidays</li> </ul>	<p>0-2 years</p> <p>High</p>	\$25,000 to \$50,000
8	<p>Undertake networking with other local governments and organisations to review the management strategy/approach to improve relationships and education of people 4WDing on beach. Possible items to include are:</p> <ul style="list-style-type: none"> <li>▪ Liaison with local and state 4WD clubs such as the Peel 4x4 Club and the Four-Wheel Drive Club of WA. It may be possible to plan educational events/showcases with clubs in combination with Shire Rangers, PBPA and Volunteer Rangers, local police and emergency services.</li> <li>▪ Share the challenges faced and collaborate with the Peron-Naturaliste Partnership as a regional coastal network and groups like Track Care WA who are experienced with these issues.</li> <li>▪ Seek support and collaboration with the Peel Harvey Catchment Council as the regional NRM group to establish a site-specific Code Off-road educational brochure.</li> <li>▪ Coordinate the approach with the PBPA and Volunteer Rangers</li> <li>▪ Consider installation of an air compressor at the beach car park to make tyre reinflation easier – maybe a token fee could be charged to provide an income stream to support education of beach users. Need to consider potential for vandalism.</li> <li>▪ Continue Volunteer Ranger program.</li> </ul>	<p>0-2 years</p> <p>High</p>	\$25,000 to \$50,000

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#	Management Action	Timeframe & Priority	Indicative Cost
9a	<p>Provide universal access to the sandy beach. Options include:</p> <ul style="list-style-type: none"> <li>Prepare appropriate design (with detailed capital and maintenance cost estimates) of a universal access to sandy beach area via a path which traverses the current pedestrian beach access to the 2030 erosion hazard line - to reduce vulnerability to storm erosion. Options may consider having an universal access decline ramp at the western end; the path material could be boardwalk, but it is likely concrete will be more cost-effective. The design should include for the seasonal provision of beach matting from the western end of the path onto the sandy beach, and/or appropriate access and landing for a free-hire option of a wheelchair suitable for use on the beach. It is likely that the matting, the transition from matting to path, and possibly the western end of the path may experience erosion damage and require higher levels of maintenance – these issues will be considered in the design process. This option is proposed following consultation with Shire staff, and would make use of the Shire’s currently available \$100K State funding for the provision of universal access to the beach .</li> <li>Investigate the feasibility of providing universal beach access via the purchase of a beach wheelchair which the PBPA could take custodianship of and provide as a free hire service (possibly one or more days a week in summer months, or over school holidays). Beach access matting could be considered also to be put out on a temporary basis by the PBPA, Volunteer Rangers or other volunteers. This would also make use of the funding, however, represents a cheaper option that could potentially allow for funding to also be spent on the lookout.</li> </ul>	<p>0-2 years</p> <p>High</p>	\$100,000
9b	<p>Ocean-view lookout – This recommendation seeks to provide more convenient access for the community to view the ocean horizon and sunsets. Options include:</p> <ul style="list-style-type: none"> <li>Prepare preliminary design (with detailed capital and maintenance cost estimates) to provide a lookout on foredune near car park to provide a destination for community members and visitors to appreciate the ocean vista and sunset views. Options can include the provision of universal access via an appropriate ramp. Detailed survey of foredune area would be required. Concrete may be suitable, and cheaper, for some components rather than a raised boardwalk style construction. This option acknowledges the feedback received on the draft FMP preferring it to the alternative location in the point below but it is noted that the number of respondents was small. This option is likely to require appropriate handrails, fencing and revegetation of the surrounding foredune.</li> <li>Investigate upgrading the existing lookout on the north side of Mitchell Road (approximately 250m east of the beach car park) to provide a destination for community members and visitors to appreciate the ocean vista and sunset views. Consider providing universal access and appropriate car-parking nearby on Mitchell Road. As a minimum the lookout should be refurbished as a destination point for people walking from town.</li> </ul>	<p>0-2 years</p> <p>Medium</p>	\$100,000 to \$500,000

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#	Management Action	Timeframe & Priority	Indicative Cost
10	Undertake a more detailed feasibility study of several sites around town for the future establishment of a caravan park. Consider coastal hazard risk areas, weather exposure, vehicle access, requirement for pedestrian beach access, land tenure, land zoning, provision of services, design life, economic forecasts of different business models and scale of operation.	0-2 years Medium	\$25,000 to \$50,000
11	Aboriginal Heritage - The sensitivity of connections, sites and cultural values should be explored through reference to local traditional owners. Consultation with local elders should be prioritised in the process to explore those cultural values and connections along the coast that are not yet registered. Subsequently, appropriate methods of recognition, celebration and acknowledgement and implementation should also be explored with local elders.	0-2 years Medium	Less than \$25,000
12	Consider refurbishment options for the ablution block, car park and foreshore amenities. <ul style="list-style-type: none"> <li>▪ Potential upgrades for the ablution block should address current maintenance and upkeep issues and allow for improved infrastructure for use by patrons of the 24hr RV free stay area. A small campers kitchen area suitable for washing dishes could be provided. Refurbishment works could be undertaken in short-term or planned to coincide with scheduled maintenance.</li> <li>▪ Car park layout modifications – consider improvements to allow for a turnaround loop for larger RV's/buses and caravan/camper trailer combinations.</li> <li>▪ Refurbishment of car park and ablution block will need to consider the feasibility of the establishment of a caravan park in the Town. If a caravan park was established close to the car park area, facilities may be shared or replaced by new ones at the caravan park and the 24hr RV free stay area could be shut down. Alternatively, if a caravan park is established elsewhere in town, facilities would still be required at the car park, but could be planned to complement those at the caravan park.</li> </ul>	2-5 years Medium	\$50,000-\$300,000
13	Review the signage provided at the car park and vehicle and pedestrian access points. Remove/replace outdated signage and install new signage as required. Focus should be on education of beach users with regard to the local natural environment and its protection (e.g., best practice four-wheel drive usage on the beach). The combined effect of the signs should be to enhance the experience of the users and the condition of the foreshore environment, without detracting significantly from the visual landscape.	2-5 years Medium	Less than \$25,000
14	A review of feral animal management should be undertaken in conjunction with input from DBCA.	2-5 years Low	Less than \$25,000

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#	Management Action	Timeframe & Priority	Indicative Cost
15	The foreshore amenities are generally of a good standard. To maintain or improve this standard to 2030 however, it will be important to undertake maintenance and refurbishment of the facilities as required every few years. Ongoing collaboration with the PBPA regarding these facilities and their renewal is recommended. Government grant funding for upgrades and additions should be sought.	5-10 years  Low	\$25,000 to \$50,000
16	Should any future development progress for the north or south end of town, appropriate planning should be undertaken to incorporate the construction of additional pedestrian beach access point(s).	Anticipated 5-10 years  Low	Less than \$25,000



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# APPENDIX A EROSION HAZARD MODELLING







## A-1 Wave Modelling

DHI's MIKE21 Spectral Wave (SW) model was used for this assessment. The model is based on an unstructured flexible mesh comprising of triangular elements. A fully spectral wave model has been used to simulate the propagation of waves. Wave breaking and diffraction are included in the model. Applied wave-breaking parameters in the model are  $\gamma = 0.8$  and  $\alpha = 1$ . Bottom friction is a calibration parameter which is determined based on Water Technology's experience in the study area.

### A-1-1 Model Grid

The model domain is shown in Figure A-1. The model extends for over 100 km in the along shore direction and for over 40km in the cross-shore direction. The offshore boundary was selected to sufficient depth to reduce shallow water impacts to wave boundary implementation.

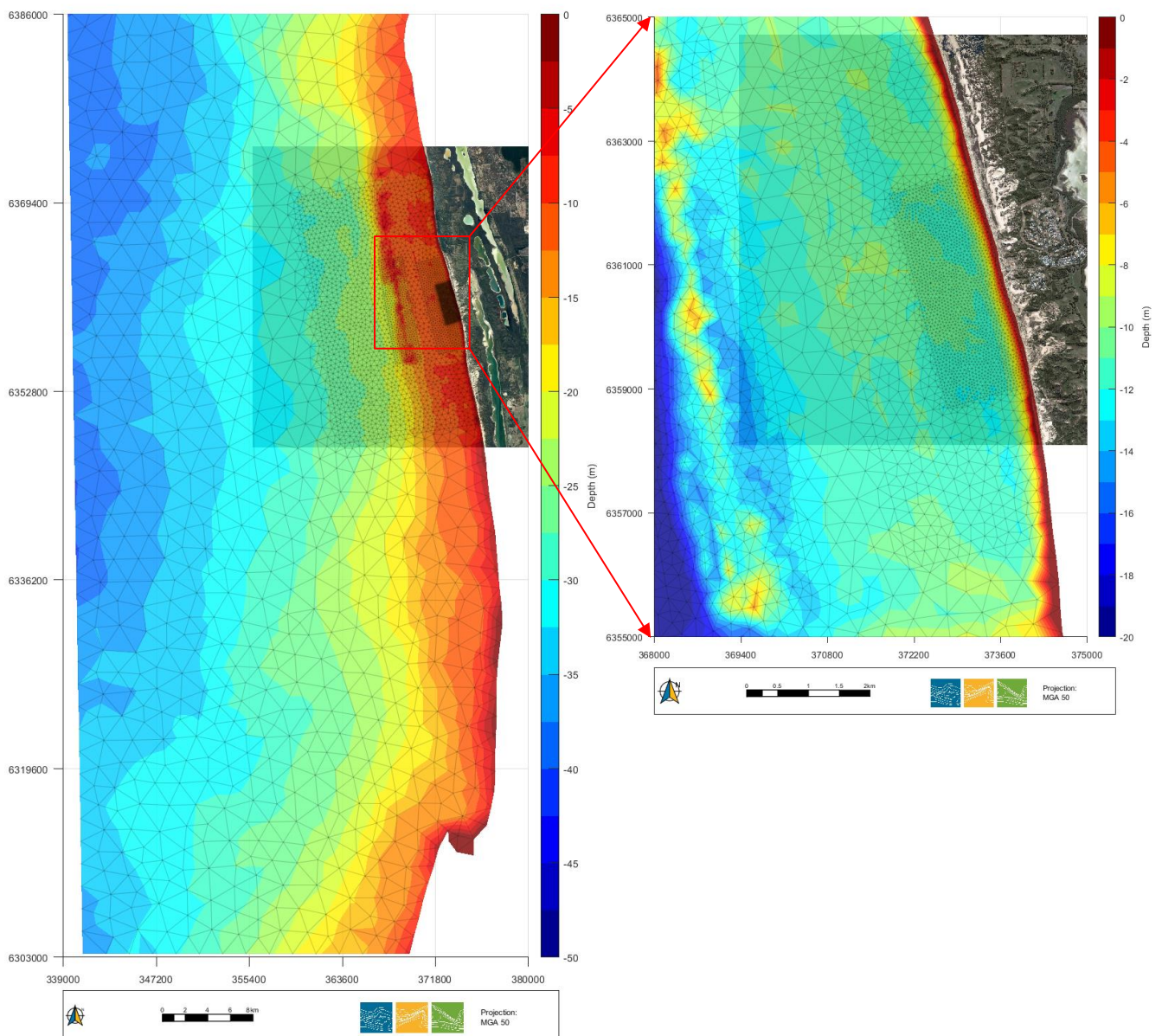


FIGURE A-1 MODEL GRID

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The mesh comprises triangular elements which enables a variation of the horizontal resolution of the model mesh within the model area, and therefore for fine tailoring of mesh/shoreline in selected sub-areas. The computational triangular mesh of the model is made by sufficiently small cells to resolve the detailed wave conditions in the study area.

The bathymetry was developed using the Lidar survey data (up to 30 m depth) supplied by the Department of Transport (DoT). The Australia Geoscience 250 m resolution was applied to fill data gaps wherever DoT Lidar data is not available. The land side topography data is sourced from DBCA aerial surveys.

## A-1-2 Model Scenarios

Model boundary conditions are obtained from (MPRA, 2018) including water levels, offshore waves and wind conditions.

Model scenarios are determined based on their risk levels within the proposed 10-year planning period. For instance, a 50-year ARI storm event has about ~18% probability of occurrence within a 10-year planning time. The likelihood of impact is determined as “possible” which can be used to define the coastal hazard lines.

**TABLE A-1 MODEL SCENARIOS**

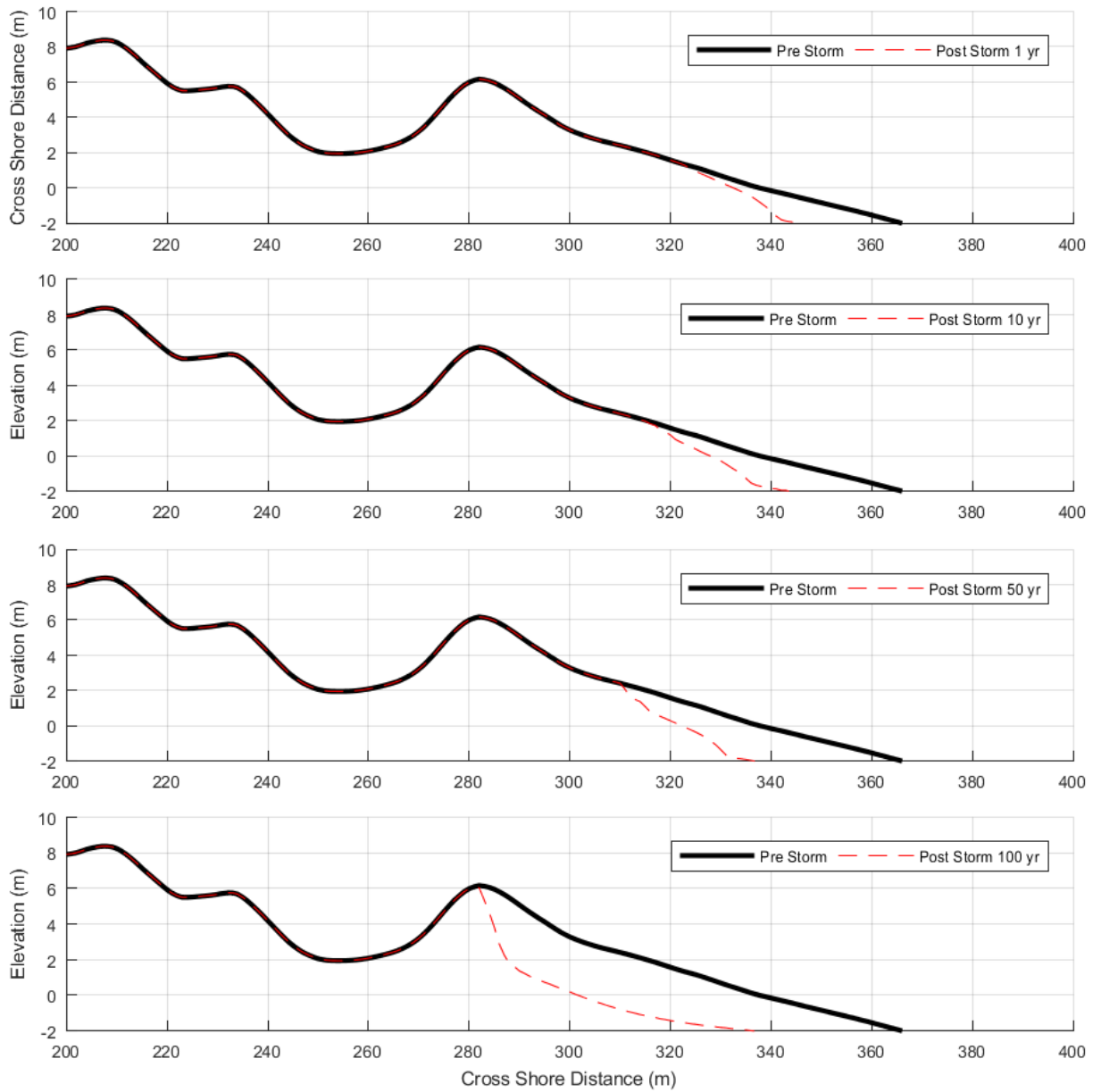
Storm Return Periods	Planning Period – 10 years		
	Risk of occurrence in planning period	Exposure	Model Scenarios
1	100%	Almost Certain	Yes
10	65%	Almost Certain	Yes
25	34%	Likely	Yes
50	18%	Possible	Yes
100	10%	Rare	Yes

## A-2 SBEACH Erosion Modelling Results

The total predicted erosion for each SBEACH profiles is presented below.

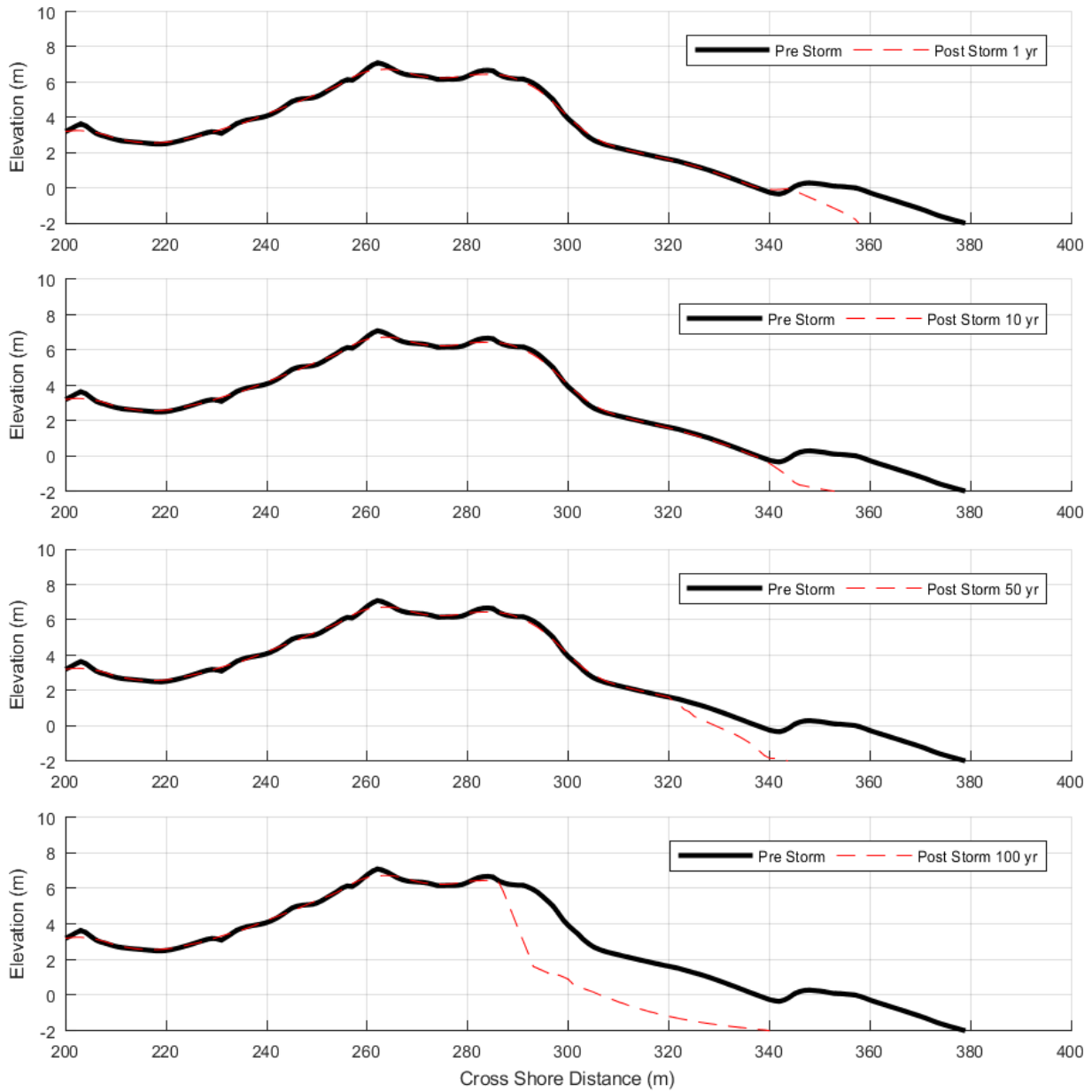
For South Beach/North Beach, the predicted erosion allowance ranges from 0 m for a one-year ARI event to over 30 m for a 100-year ARI event. For the Swimming Beach, the predicted erosion is slightly smaller while still in the same range. Severe storms (over 50-year ARI) may cause step impacts to beach formation.

Overall, the modelled erosion is similar along the straight shoreline of Preston Beach. An average winter storm is unlikely to cause severe damage to the beach and the sand dune behind. Rare/severe storms, however, may contribute to over 30 m of erosion from the current HSD which should be closely monitored. Erosion affecting the land depression behind the primary dune is a risk that should be considered in long-term planning.



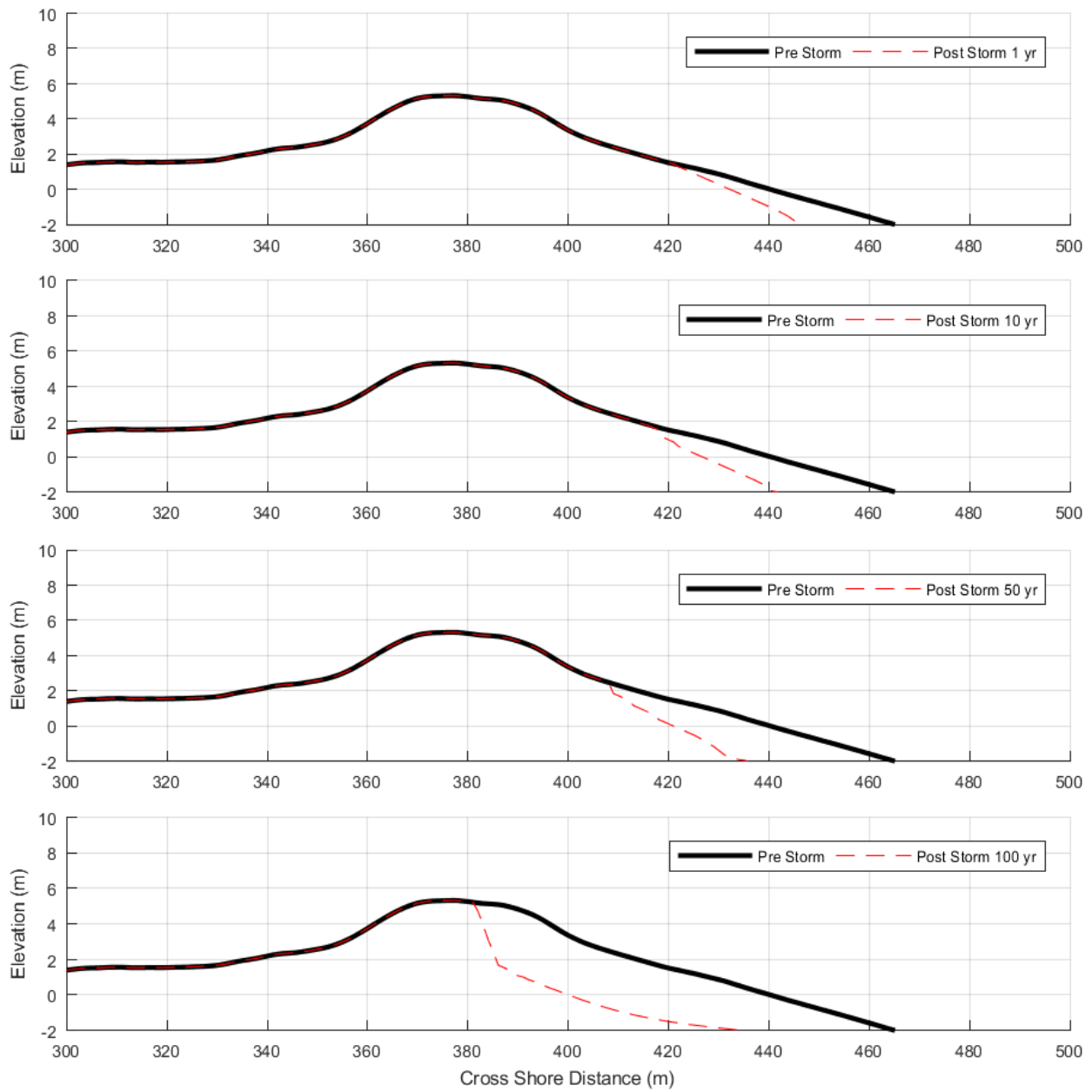
**FIGURE A-2 PRE-STORM/ MODELLED POST-STORM BEACH PROFILE AT SOUTH BEACH M(AHD)**

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**FIGURE A-3 PRE-STORM/ MODELLED POST-STORM BEACH PROFILE AT SWIMMING BEACH M(AHD)**

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**FIGURE A-4 PRE-STORM/ MODELLED POST-STORM BEACH PROFILE AT NORTH BEACH M(AHD)**

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# APPENDIX B COMMUNITY AND STAKEHOLDER ENGAGEMENT PLAN



# Preston Beach Foreshore Management Plan

## Community and Stakeholder Engagement Plan

Prepared for Shire of Waroona

02 July 2020



## Document Status

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# 1 INTRODUCTION

## 1.1 Background

The Waroona Shire LGA coastal zone is an important social, environmental and economic asset for the region. It contains iconic sandy beaches and foredunes, and areas of significant social and recreational amenity for both residents and visitors alike (see Figure 1-1). The suburb of Preston Beach is also home to a passionate local community, who are heavily invested in the utility and management of the foreshore.

The foreshore along the local government area (LGA) is directly exposed to ocean swells, and is therefore periodically exposed to coastal erosion and inundation. Furthermore, it is likely that the risks associated with these hazards will increase over the coming decades due to the sea level rise and other climate change impacts.

In addition to these natural hazards, the foreshore is also exposed to the pressures associated with recreational and touristic uses. Owing to the coastal lakelands to the east of the dunes, the LGA foreshore is not easily accessible to the broader population, and Preston Beach is the only coastal town with full access to the foreshore in between Dawesville in the City of Mandurah and Myalup in the Shire of Harvey. Preston Beach is therefore a highly popular destination for recreational activities that include swimming, fishing, and four-wheel-driving (4WD) beach recreation.

In order to effectively manage these pressures, the Shire of Waroona (the Shire) is commencing the process of updating its existing Foreshore Management Plan (FMP) for the area. The existing plan dates back to 2002, and requires an update to be consistent with the current state government coastal management and adaptation planning frameworks, as to include the latest climate change projections. The updated plan intends to build on the existing Waroona FMP whilst ensuring the Shire has a well-defined and holistic vision for the foreshore's management for at least the next 10 years.

## 1.2 The Community and Stakeholder Engagement Plan

Key to the success of the project will be to ensure that the plan is underpinned by community and stakeholder values and knowledge. To this end, a Community and Stakeholder Engagement Plan has been developed in order to identify relevant stakeholders, and determine the structure and pathways for their engagement through the process. The plan is intended to be fit-for-purpose, and commensurate with the size and scope of the FMP – so as to avoid consultation fatigue within the community.

This plan has been prepared in accordance with the requirements of, and for consistency with, the following documents:

- *The Shire of Waroona (Draft) Strategic Community Plan 2030*
- *The International Association of Public Participation (IAP2) documentation*

The overarching objectives of the community and stakeholder engagement plan for the FMP are:

- Establish strong working relationships with community networks and stakeholders which are built on mutual trust and respect
- To ensure all stakeholders have up to date information about the FMP, and the broader coastal management framework that supports the project;
- To provide the community and relevant stakeholders the opportunity to have direct input into the development and delivery of the FMP.
- To understand community goals and aspirations for the coastal zone and community views on values, assets, opportunities and priorities

- To aid in the identification of key issues and the selection of site-specific FMP management actions to address them. Stakeholders on the ground will have knowledge of the site developed over years of interaction. This provides invaluable information that can be applied to generate innovative FMP measures.
- Increased community and stakeholder understanding of, and support for, actions and priorities in the FMP



FIGURE 1-1 STUDY AREA AND LOCALITY PLAN

### 1.3 Impacts of COVID-19 on this Plan

At the time of developing this plan, it is noted that state and federal governmental guidance and policies regarding the COVID-19 pandemic may present challenges and limitations with regards to in-person community and stakeholder engagement tasks. The situation is complex and dynamic, and the timing and duration of state and federal government policies cannot be reasonably predicted over the life of the project (at least at this stage). Therefore, the plan will need to consider the possibility that social distancing restrictions may affect the engagement activities throughout the project. If this comes to bear, then the engagement plan may need to be reviewed in order to adequately align with the developing circumstances and ongoing government advice.

## 2 STAKEHOLDER IDENTIFICATION & ANALYSIS

### 2.1 Internal Stakeholders

Internal stakeholders are those that are part of the decision-making team. Predominantly, these will be Shire of Waroona Councillors and staff, although state government will also play a role. A project Steering Committee has been established to oversee preparation and completion of the FMP, including review of project deliverables. The Steering Committee plays an advisory role in the project and consists of representatives from:

- Shire of Waroona
- The Peron Naturaliste Partnership (including the adjacent Councils of Shire of Murray and Shire of Harvey)
- Department of Biodiversity, Conservation and Attractions
- Department of Planning, Lands and Heritage.
- Community Groups, such as the Preston Beach Progress Association

Members of the Steering Committee are invited to take part in all engagement activities. Practically, it may be that a subset of members is involved in each, and this is reported back to the group during the Steering Committee meetings. Outcomes and summaries of each engagement activity will be incorporated into the overall project deliverables and included in the fortnightly progress updates to the Shire's project manager.

### 2.2 External Stakeholders

External stakeholders are those that are not decision-makers, but who are affected by the project. They might live near the coast, use an asset or resource located in the coastal zone, or simply have an interest in the coastal foreshore reserve. Some external stakeholders have been identified below; and each engagement activity will be publicly advertised to ensure those not captured below still have an opportunity to engage. External stakeholders for this project are likely to include:

- Community members (see Section 2.2.1), including:
  - Individual residents and ratepayers
  - Non-resident ratepayers
- Community and business groups (<https://www.waroona.directory/>)
- Representatives from the Waroona Aboriginal and Torres Strait Islander Corporation (WAATSIC)
- Preston Beach Golf Club

#### 2.2.1 Community Profile

In order to develop suitable engagement methods, a community profile has been developed that identifies some characteristics of the local community. This data has been extracted from the 2016 Australian Bureau of Statistics *QuickStats* data (ABS, 2016) for both the suburb of Preston Beach, and the Waroona Shire LGA as a whole. Analysis is provided in Table 2-1.

**TABLE 2-1 COMMUNITY PROFILE**

<b>Indicator</b>	<b>Preston Beach</b>	<b>Waroona Shire LGA</b>
Population	227	4,148
Median Age	62	45
Ave Persons Per Household	1.9	2.5
Aboriginal and/or Torres Strait Islander people	8	101
Speaking English at Home	96.3%	83.5%
Work Full or Part Time	75.8%	82.4%
Total Dwellings	329	1903
Dwellings Occupied	30.4%	76.4%
Internet Accessed from Dwelling	74.5%	76.1%

### 3 ENGAGEMENT APPROACH

#### 3.1 Level of Consultation

As per the International Association of Public Participation (IAP2) Spectrum of Public Participation, levels of engagement have been defined as the following:

- **Inform** stakeholders about the project, and the development of the FMP.
- **Consult** with stakeholders on the draft FMP.
- **Involve** stakeholders in assessing the management actions presented.
- **Collaborate** with stakeholders to determine the level of risk tolerance, community values attributed to coastal assets and to identify potential management actions.

Each phase of the plan is assigned a level of consultation, allowing the consultation activity to be scoped appropriately. At the commencement of each activity, the level of influence their contribution will have on the overall outcome should be clearly defined. Managing stakeholder expectations regarding their involvement will assist with ownership and acceptance of the FMP.

Levels of impact increase as per Figure 3-1, adapted from IAP2.

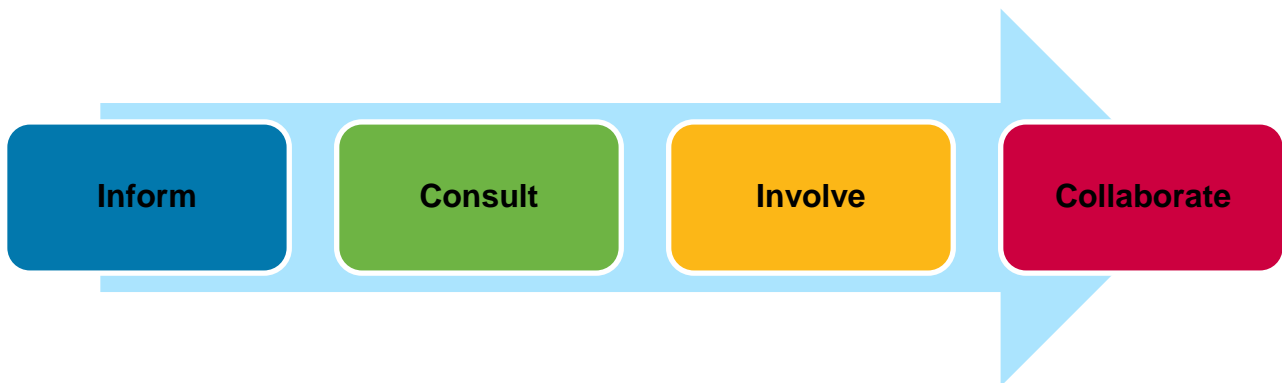


FIGURE 3-1 IAP2 SPECTRUM OF PUBLIC PARTICIPATION; IMPACT ON THE DECISION INCREASES FROM LEFT TO RIGHT

#### 3.2 Strategy Messaging

A consistent, central information source will be helpful in managing the consultation process. The Shire may wish to prepare a project specific webpage of information as a central repository for the community. This could be located on Councils website or Facebook page, and include a brief description of the project, as well as key strategy messaging for the project, such as:

- The project is initiated and funded by Council and the Department of Planning Lands and Heritage.
- A Steering Committee has been established to oversee preparation and completion of the FMP, including review of project deliverables.
- The consultants carrying out the project are Water Technology, with support from sub-consultants UDLA who will provide planning advice.
- The FMP will provide an opportunity to develop a strategic approach to management of the foreshore.
- The project will identify the coastal hazard risk for the study area over the next ten years. This will enable Council to optimise its use of the coastal foreshore reserve in present day, and plan for how this may change in the future.

- The development of the program will include engagement with the local community.
- Unless otherwise stated, information gathered from stakeholders during the project will only be applied to the project and will remain confidential.



## 4 ENGAGEMENT PLAN

### 4.1 Implementation Plan

The engagement plan for the FMP is outlined below. The timing of the activities outlined herein should be discussed and confirmed upon review of this draft plan. However, indicative timing is provided herein. The program will be made up of the following components:

- **Community Workshop #1:** To understand the local community’s values, and their perceptions of the key issues.
- **A Community Survey:** With similar objectives to Workshop #1, but to ensure that those who can’t make the workshop are provided an opportunity for engagement. It will be available electronically as well as hard copy.
- **Community Workshop #2:** To obtain feedback on the Draft FMP.

### 4.2 Community Values and Issues

TABLE 4-1 COMMUNITY WORKSHOP #1 – COMMUNITY VALUES AND ISSUES

Engagement	
Engagement Level	Inform, Consult, and Collaborate
Stakeholders	Internal & External
Date and Time	Mid-to-Late August (indicative only for now - TBC after review of this draft plan)
Duration	~1-1.5 hours
Location	Preston Beach Community Hall
Advertised	Councils Website, Social Media, Local Media such as the “Sea to Scarp” newsletter. Hardcopy of information can be made available at the general store, Progress Association, Golf Club and Footprints Reception
Expected Attendance	Approx. 30-50 people
Team Participation	<ul style="list-style-type: none"> <li>▪ 2 x Water Technology coastal engineers</li> <li>▪ 1 x Planner from UDLA</li> <li>▪ Council / Steering Committee Project Staff</li> </ul>
Content	<p>We propose that the first workshop should be aimed at understanding the local community’s values, and their perceptions of the key issues facing the study area. This should involve an initial presentation provided by the study team, followed by a series of round-table community discussions. The structure could be:</p> <p><b>Presentation:</b> In the first instance a 5-10 minute presentation will be given by the project team that provides an overview of the project, and an outline of the workshop activities.</p> <p><b>Workshop Sessions:</b> This will comprise a series of around 4 “workshop” table discussion areas. Based on attendance estimates, each table may have around 5-10 persons at a given time. Each session will comprise a two-way, deliberative, and structured round table that can be facilitated by either a member of the project team, or a Council officer. In these sessions, community members will have an opportunity to provide information regarding:</p>

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Engagement	<ul style="list-style-type: none"> <li>▪ Community uses, and areas of high social, environment and cultural value; and/or</li> <li>▪ Community concerns regarding potential issues (including their priorities) to be addressed in the updated FMP. This can also ascertain feedback regarding the current management plans and opportunities for improvement.</li> <li>▪ Community feedback on the potential location of a caravan park on R32010 and relevant issues to be addressed.</li> </ul> <p>Consultation materials can include printed A3 aerial imagery and study area maps. The sessions should last around 45 minutes, which should give sufficient time for community member to engage in discussion and provide input. Drafts of materials for workshop will be provided to Council for review in advance of the event.</p>
COVID-19 Risk Management	<p>The WA Government advises that (as of 16 July 2020):</p> <p>“Phase 5 is will result in the removal of the 2sqm rule and the 50 per cent capacity for our major venues. It is also expected to see the removal of all gathering restrictions, other COVID-related rules introduced by the WA Government. The new tentative date for Phase 5 will now be Saturday, 1 August. A final decision on whether Phase 5 can proceed on this date will be decided in about 2 weeks’ time”.</p> <p>This should be addressed closer to that date, but at this stage it is possible that COVID restrictions on the event may be minimal.</p>

TABLE 4-2 COMMUNITY SURVEY

Engagement	Community Survey
<b>Engagement Level</b>	Inform & Consult
<b>Stakeholders</b>	Internal & External
<b>Date and Time</b>	Survey to remain open for 4 weeks (notionally, from 2 weeks before the workshop to 2 weeks after)
<b>Duration</b>	4 weeks
<b>Location</b>	<ul style="list-style-type: none"> <li>▪ Via a SurveyMonkey web link (that can be posted on the project website and/or social media</li> <li>▪ Hard copies can be made available at the general store, Progress Association, Golf Club and Footprints Reception. They can also be distributed during the workshop</li> </ul>
<b>Advertised</b>	Councils Website, Social Media, Local Media such as the “Sea to Scarp” newsletter. Hardcopy of information can be made available at the general store.
<b>Content</b>	<p>The survey will mirror the content and objectives of the community workshop. The purpose of the community values survey will be to obtain a snapshot of:</p> <ul style="list-style-type: none"> <li>▪ How often locals visit the foreshore and what activities they engage in whilst there;</li> <li>▪ What the local community considers to be the most important ecological, social, cultural, aesthetic, recreational, and economic values of the study area;</li> <li>▪ Community perceptions of key issues.</li> </ul> <p>The survey should consist of around 7-10 questions and take around 10-15 minutes to complete. It will use a combination of tick box and Likert scale</p>

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Engagement	Community Survey
	<p>response options to gain a detailed insight into community attitudes, knowledge and experiences.</p> <p>Drafts of the survey will be provided to the Shire for review in advance of its release.</p>

### 4.3 Draft FMP Consultation

The Draft FMP will first be submitted to the Steering Committee for a review. Based on review comments, the report will be updated, and a Revised Draft FMP document will then be advertised publicly for comment. For this, the draft report can be made available online at the project web page and/or in hard copy at the main offices of Council, the progress association, golf club and general store.

TABLE 4-3 COMMUNITY WORKSHOP #2 – DRAFT FMP CONSULTATION

Engagement	Community Survey
<b>Engagement Level</b>	Inform & Consult
<b>Stakeholders</b>	Internal & External
<b>Date and Time</b>	Likely November 2020 (indicative only for now - can be confirmed closer to the date)
<b>Duration</b>	~2 hours
<b>Location</b>	Preston Beach Community Hall
<b>Advertised</b>	Councils Website, Social Media, Local Media such as the “Sea to Scarp” newsletter. Hardcopy of information can be made available at the general store, Progress Association, Golf Club and Footprints Reception.
<b>Expected Attendance</b>	Approx. 30-50 people
<b>Team Participation</b>	<ul style="list-style-type: none"> <li>▪ 2 x Water Technology coastal engineers</li> <li>▪ 1 x Planner from UDLA</li> <li>▪ Council / Steering Committee Project Staff</li> </ul>
<b>Content</b>	<p>It is proposed that the second workshop should be aimed at garnering feedback on the Draft FMP document.</p> <p>It is proposed that this will be an informal, open house “drop in” session (also referred to as a listening post). The community and stakeholders may come and go at their own convenience during the allotted time, and this encourages broad community participation and reduces the risk of groups mobilising or vocal people dominating.</p> <p>The community and stakeholders are invited to view displayed material, written and graphic (likely as posters) that summaries the actions outlined in the FMP. Verbal and/or written feedback can then be provided on an individual basis to members of the project team. Individual feedback can be captured on a variety of mediums that allow for easy collation and analysis</p> <p>Such drop-in sessions provide an opportunity to both inform a large cross-section of the community about the FMP as well to provide feedback (consult) on the FMP.</p>

Engagement	Community Survey
<b>COVID-19 Risk Management</b>	<p>The WA Government advises that (as of 16 July 2020):</p> <p>“Phase 5 is will result in the removal of the 2sqm rule and the 50 per cent capacity for our major venues. It is also expected to see the removal of all gathering restrictions, other COVID-related rules introduced by the WA Government. The new tentative date for Phase 5 will now be Saturday, 1 August. A final decision on whether Phase 5 can proceed on this date will be decided in about 2 weeks’ time”.</p> <p>This should be addressed closer to that date, but at this stage it is possible that COVID restrictions on the event may be minimal.</p>

## 5 MONITORING & EVALUATION

Following initial engagement, each subsequent engagement activity will clearly include how previous engagement has been applied. This builds community trust, as stakeholders can see they have been listened to and views were recorded. In addition, transparency of the process will aid in fostering community acceptance.

Additional feedback mechanisms are as follows:

- Each workshop will issue a post-workshop evaluation survey.
- Feedback sought from the Steering Committee at each deliverable submission.
- A summary of the engagement process will be included in the Final FMP.



# APPENDIX C COMMUNITY AND STAKEHOLDER ENGAGEMENT SURVEY - RESULTS





## C-1 Survey summary results

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## C-2 Written text responses summary for Questions 5-8

### C-2-1 Q5 What words or phrases would you use to describe what you like about the foreshore?

- Natural, clean, abundant sea life, freedom
- It's very unique and unspoilt.
- UNIQUE, PRISTINE
- Fish gutting area. Sinks, with benches for descaling the fish. Fishing line disposal unit of somewhat.
- Not dominated by infrastructure
- Isolated and quiet, with beautiful vista.
- Untouched
- 4WD Access to the beach for swimming, fishing away from the main beach with plenty of space for all.
- Rugged - natural
- Magnificent ocean...wonderful for walking ...good fishing
- Close proximity to home. Wide expanse
- Rugged, untamed, pristine
- Peaceful Natural
- Clean close love it
- Good playground equipment
- Not highly developed. Natural vegetation right to the foreshore.
- Refreshing in summer, relaxing in winter
- During the week it is peaceful, relaxing place to go. The weekends are another thing.
- Wide, open spaces. Beach, as far as the eye can see. Uncrowded. Being able to take your vehicle onto the beach so you can take all your fishing gear, chairs, etc.
- Being able to access the beach by four-wheel drive to go to the different fishing spots depending on the time of year.
- Free and open bring business to the town.
- Unspoilt peaceful
- Clean
- Fishing, 4wd, ability to enjoy without overcrowding, sounds.
- It's a family recreational place.
- Relaxed activities amongst friends
- Accessible to 4WDs, Able to drive down the beach and choose where to stop.
- access to four-wheel driving





- The foreshore and its interaction/association with the hinterland and national park supports a range of marine and terrestrial ecosystems flora and fauna that we highly value and which is different from other beach side residential communities to the north and south of Preston Beach. This is the main reason we decided to buy a holiday home in PB. Our ability to access and enjoy these ecosystems and the environmental values they support.
- 4Wd access, clean beach
- Preston Beach is awesome location lovely Beach great for family outings and for club meetings and relaxing.
- natural beauty
- Coastal environment
- Beautiful coastline
- freedom to access the beach by 4-wheel drive vehicle.
- great place to relax & maybe catch a fish or two.
- It's a beautiful unique part of Australia and should be accessible to all in the way it has been for many years.
- the freedom to be able to drive to where I can go fishing or swim as I am no longer able to walk very far.
- Accessible, unrestricted
- The beauty of it as I use grow up there in the 1970's with my parents as we had a farm on Peppermint Groove in Waroona and that was closest beach.
- Peaceful, relatively close to Perth to get away especially with the dog, as there are less and less place where you can.
- Freedom, fun, 4wd
- It's about family's getting out in the fresh air and enjoying the country they love. ❤️❤️
- I'm able to f . W . d on the beach and have my car with me to get food and cold drink close to me not have to leave my rods and bait to walk back to the car on other beaches thanks for keeping axes to the beach.
- Priceless recreation
- Natural and unblemished beauty
- Freedom and you can always find a spot away from the crowds.
- The foreshore is suitable at present for my simple needs of 4wd and swimming. However, it is a great location to bring my young grandchild knowing they are safe and having fun.
- Diverse range of fauna
- unspoiled
- Beautiful, relaxing spot.
- Access to the beach by 4 x 4 and fishing
- 4x4 access for now and as I get older, I can always access the beach easily to fish. Social interaction.
- Beautiful beach and water with fewer people than in other places
- It's a nice place to fish but very hard to walk to due to the loose sand as you get older.
- Attractive low-key beach that is safe for family recreation and is defined by a natural system of dunes that provides a sense of enclosure to the foreshore and a secure habitat for flora and fauna.



- Great place
- Beautiful; inaccessible for some
- A long expanse of beautiful beaches to enjoy our activities.
- Just a nice place to walk and maybe fish occasionally.
- Unspoilt
- Peace and quiet.
- Accessible, beautiful, relaxing, unspoilt
- Unique inviting relaxing beautiful
- Open, 4wd accessible,



## C-2-2 Q6 What issues are you most concerned about for the foreshore?

- Fishing in swimming area, speed of 4WDs, potential for any fires lit to sweep thru community on SW winds.
- The 4WD speeding and have no consideration for families. They go in the dunes and camping in the dunes and on the beach. Littering. Need full time Ranger.
- OVERFISHING, TOO MANY 4WDS ON PUBLIC HOLIDAYS, VEHICLES AND TRAILBIKES IN DUNES, BEACH CAMPING, 4WDS SPEEDING
- The beauty of Preston Beach taken away from its natural beauty already!!
- The way some people drive on beach.
- Sustainability and harmonious co-existence.
- Overuse
- People not doing the right thing with regards to 4wd and stuffing it up in the future for others
- Erosion - people walking where they shouldn't.
- Erosion
- The lack of Rangers to control the unthinking (mostly visitors) who show no respect for others or the environment. The beach gets cut up.
- To many vehicles on the beach in both directions and lack of control of speeding and antisocial behaviour. Rubbish on beach. Ugly tyre ruts along the beach with no restriction on where people drive and how they drive.
- 4WD's speeding and not reducing tyre pressure. Destruction of habitat of shellfish along the beach
- Vehicles driving at excessive speeds on the beach.
- I am disappointed that all-terrain vehicles are not allowed as a homeowner it would be great if a permit system could be implemented as a way to get to the beach more effective.
- Ablution block. Rubbish left by people who drive on the beach and even when bins are full leave it next to the bins.
- Walkway deterioration by moving sand, ignorant 4WDrivers, dune erosion and stabilisation.
- 4wd's using it has a speedway.
- Racing of 4WD's on the beach especially on the weekends. It is like they are using it as a speedway. Have been at Preston 20 years and each year it gets worse.
- Issues that arise from misuse of the foreshore such as: Vehicles travelling too fast for the conditions which endangers other people on the beach, especially children. Damage to the sand dunes. Uneducated 4WD drivers who don't reduce the air pressure of their tyres enough therefore creating corrugations of the track along the beach.
- disrespectful use of the beach by people who are not educated in the proper use of their vehicle and lack of respect for other beach users. I believe we need signage in large letters for a reasonable speed limit of 30-40km and other signage again in big letters to let your Tyers down to 18-20PSI. This would help keep the foreshore in better condition for all concerned.
- Local opposition
- Excess use/degradation



- The overnight stay at the car park gets to many people staying for long periods when Martin tank camping ground is close for them to use.
- Blocking access to 4wd and families, limiting fishing and other recreational activities
- No allowing to drive on the beach.
- Rubbish left around.
- Damage to sand dunes (driving should be restricted to the beach)
- closing access to four-wheel driving
- As with many environmental assets, popularity and increased local/interstate and international tourism can put a strain on the ecosystems. The forward management plan needs to consider how to best manage/reduce these impacts yet encourage the responsible increased utilization.
- restricted access
- hooners destroying the land scape.
- bad 4W drivers (minority)
- Rubbish and irresponsible behaviour.
- Over crowding
- Closure to beach access for 4-wheel drive vehicles.
- rubbish & erosion.
- Rubbish left by a few.
- hooners and rubbish.
- Being closed to vehicle success
- The people who have no respect for the beach.
- Rubbish both what floats in and what's left by the selfish few. If you stay on the beach, there is little impact on the Dunes.
- Restricted access - this will only stop responsible users from using it - the ones who are wrecking it will do it anyway.
- People doing the wrong thing and punishing the ones that are doing the right thing. We need to work together to make our foreshores better for all of us. ❤️
- Idiots not letting tyre pressures down on the beach and getting bogged.
- Why do I get the impression that someone has an axe to grind regarding the public enjoying this beautiful beach, I've been enjoying this beach for years with my family, it doesn't change, nature takes care of itself As a life member of the Four-Wheel Drive Club of WA a lot of our new members learn to appreciate and respect areas like this, we are the people behind cleaning up any rubbish! and taking it away. leave it as is so their families can enjoy.
- Litter and dune damage.
- Free access being restricted.
- The rubbish that is left after a long weekend. I can remember coming down with a trailer on "clean-up" day.
- unauthorised vehicle access to areas behind foredunes loss of stabilising vegetation on dunes through too much human access and overgrazing by native and introduced animals.




- Remaining open for a wide variety of recreational uses, including fishing, swimming and 4WD use.
- Closing the beach to 4 x 4 access
- That 4x4 access be restricted in any way.
- 4WD tearing up the beach. I believe they destroy the habitat for many coastal creatures.
- No easy access or jetty.
- The increasing number of 4WD's using the beach. The row of unsightly tyres used to prevent vehicles entering the swimming area. The vertical pipes are a more attractive alternative.
- Access for those with mobility issues 4WD going through the swimming area / fishing in the swimming area.
- Protection of the resource without over regulation. Most people do the right thing automatically.
- Storm Damage and 4WD owners need to follow speed limit.
- Illegal camping. Use of 4WD's in the dune areas. Litter.
- 4-wheel drivers, too many close calls when I'm walking.
- Erosion, lack of adequate signage (e.g., "no fishing" signs are very confusing), not accessible for people with disability, ticks are an issue near the play equipment.
- Safety for all, ease of access for all, enjoyment
- Idiot beach goers



### C-2-3 Q7 Do you have any ideas that should be considered during the review of the foreshore management plan?

- Make signs re swimming beach rules clearer, in people's faces, coz they don't read the one off the side of pathway.
- Area for older children so they can kick the ball around or play cricket. Green waste site is ideal position. More gazebos and BBQ's.
- LIMIT FREE 4WD ACCESS TO RESIDENTS, HAVE AUTOMATIC GATED ACCESS VIS PAYMENT SYSTEM TO FUND FULL-TIME 24-HOUR RANGERS. HAVE SOME FISHING CONSERVATION AREAS TO IMPROVE THE MARINE WILDLIFE.
- No
- Do away with green waste dump and turn into parking and overnight stay area for vans.
- No
- No
- Area at start of the beach access tracks for letting down tyres and re inflating them.
- Have a viewing platform not a deck to the water Look at Albany Middleton beach
- Native animal habitats
- Review the number of Rangers and give them some power to write infringements. More signage makes the limits and area delegations clearer. Would love to see the boardwalk and viewing platform.
- Cars restricted to north only. More presence of paid Rangers and policing of vehicles. I.e., power given to Rangers for infringements. Annual pass system for beach access with vehicles. Use of drones to monitor beach use and behaviours. Close beach access for vehicles in winter.
- Monitor 4WD and bikes entering the sand dunes.
- More frequent monitoring and prosecution of speeding vehicles on the beach
- As above a permit system to allow quad bikes.
- More bins emptied more frequently. Also, some exercise stations in grassed area.
- A redesign of the car park so that large caravans can do a 'U' turn at the head of the car park next to the foreshore. Cars fill up the dual bays further to the east, resulting in caravans having to reverse out of the car park when they realise, they cannot easily turn around.
- Boom gates, and the fees obtained be used as a means to employ more people to police the area.
- Speed limit needs to be monitored more. Offender should be banned if they keep speeding.
- I like the idea that was discussed at the meeting about a small RV/caravan short stay (e.g., 3 nights) area being established near the beach car park.
- We currently have volunteer Rangers who do a good job but have no powers to hand out tickets or enforce any rules. It's all very well to say they can take details and pass them on to the Shire Rangers, but that process would take too long, and the Shire Ranger may not deem the incident important enough to continue with an infringement which will undermine the volunteer Ranger's authority.
- Yes, a tourist attraction. Pub Cafe mega kids' playground similar to Donny brook
- Make it cleaner and more family friendly like binningup which looks nice.
- Needs to consider locals as well as visitors, ability for multigenerational access.



- keep access may be more policing by Rangers etc.
- If people are doing the wrong thing (damaging sand dunes, speeding, leaving rubbish etc) then Rangers should have the authority to fine them. Which means making it clear via signposting what the rules are.
- leave beach open for all users.
- I am concerned that the local member expressed an interest to restrict access to the beach with some sort of permit or pay as you go system. I don't feel that this is in the Australia spirit of equal access to our natural assets not to mention the idea seeming practically unworkable. At the community meeting a common theme of local residents is basically 4x4 beach drivers behaving irresponsibly. I feel that this should be addressed in a friendly sympathetic passive manner rather than through some sort of rules/permits/enforcement approach. If the shire proceeds with a caravan park and encourages increased vacation stays in PB then this issue will only get worse so an integrated management plan should address both. Information on good beach driving etiquette, provision of a tyre inflation compressor station in the beach parking lot, and improved low-cost camping facilities with controlled fire pits for use in winter will help encourage people to lower tyre pressure, not camp on the beach and not have uncontrolled fires on the beach.
- N/A
- Rangers to book the unruly
- to still have access to the beach to drive on.
- In regard to 4WDs contact the 4WD Assoc of WA and independent clubs / organisations such as the Four-Wheel Drive Club of WA and Trackcare WA to formulate a plan for beach access and use by vehicles.
- Get 4WD clubs and other organizations to participate in clean ups.
- Maintain vehicle access to the beach.
- as long as it's open.
- It was ok the way it was, trying to improve facilities will make it too popular and possibly detract from its uniqueness!
- more bins
- Leave it open for people of all ages to access. We are not all young and to stop access to the beach for my 4WD means that another place is closed off. We all care about the environment.
- Make the rules clear and then enforce them.
- Don't be blind sided by negative people putting their point forwards. We all should be able to have a voice .
- Get the f w d clubs involved in replanting the foreshore I'm in Fwd club of w.a. we go to more river to replant the dunes up there so if you need help contact the club.
- Place conveyer belt on the entry and exit at White Hills area, this will protect the sand dunes and makes it safe four users Have a look at other places down south that have Installed this method.
- Confining vehicles to beach only. Fence off the dunes from vehicles including quads and motorcycles.
- No
- Please consider the 4wd clubs that use the foreshore sensibly.
- use of beach, foreshore and dune swales by resting and nesting shorebirds.
- Continued management of the area to ensure users comply with the rules: - e.g., numbers of fish caught, camping overnight, speed limits etc.



- A permit system so people who use the beach are educated on the speed limits, protection of sand dunes, etc.
- That an open covered meeting building should be erected for clubs fishing 4x4 etc to run courses from and meet up. Local radio station to tune in to get information and promote correct beach etiquette. 4x4 and fishing clubs be involved in enforcing correct behaviour. Increased use/presences of Police at Beach over summer. Tyre pressure checks before going onto the beach. Better shower and toilet facilities.
- Put in a road parallel to the beach with regular beach access points so it can still be used with significantly less impact.
- Have a look at Jurien bay and just replicate their beachfront it is fantastic and people friendly.
- The possibility of establishing a limited number low key short stay caravan /camping park in the vicinity of the current bush tip to meet the needs of travellers and tourists, given that the old caravan park has been replaced with the Footprints resort.
- Improved accessibility to the beach front
- Don't spoil things for the locals.
- Registration of vehicle using the foreshore, a Small fee that can help with upkeep.
- No
- Policing the 4-wheel drives
- A boardwalk to the beach would be fantastic. Car park could do with a reconfiguration to make it flow better in peak times. Play equipment could be upgraded.
- A boardwalk for ease of access, improved signage, relocation of climbing frame to foreshore area.
- No





## C-2-4 Q8 Do you have any general comments about the foreshore and its management?

- Let's paint the black bollards, way too ugly now.
- Needs a full-time Ranger to maintain the area and patrol the beach and hand out fines not warnings to 4WD.
- MORE RANGERS REQUIRED TO MANAGE.
- No
- No
- No
- It's a nice little area, toilets n showers sufficient. Maybe more regular rubbish removal from bins. You see it often overflowing.
- Keep the beach open to vehicles Preston beach Rangers do a great job.
- No
- Who does what?
- Would like to see more in place to attract families. I.e., recreational area near car park for picnics etc. the coastal region is already constantly impacted by the weather, volume of vehicles and driving at speed without deflating tyres sufficiently exacerbates the situation.
- No
- The majority of beach users are respectful of others.
- I am happy with it.
- More signage instructing four-wheel drivers of speed limits seatbelts tyre pressures etc.
- A caravan park would be great, but not at the reserve at the foreshore.
- Not really, I think it is pretty good now.
- Management is about facilitating positive, responsible and respectful use of our natural resource, the foreshore, by residents and visitors. Most people 'do the right thing'. However, the challenge is how to inform and educate those who don't.
- I believe that four-wheel drive clubs should be deterred from using Preston Beach as a training area for club members. I have witnessed in person some members of four-wheel driving clubs go off the beach and into the sandhills which shows a total disrespect for the environment.
- It's doing fine.
- No
- Rethink allowing overnight stays in the car park it becomes intimidating when so many are there camping and getting dressed in the open. Use another area or direct them to Martin's tank.
- N/a
- no
- As far as I can see it is currently being well managed.
- it is a great place for a day out at the beach.



- I am not sure what options are being considered for a new caravan park, but it seems as if only one is under review by the consultants. The beach green waste area is quite exposed to wind and sun and it may not be ideal. Perhaps there are other restrictions on other possible sites in town that I am unaware of. My main concern is that whatever caravan camping option is considered, is that it should be affordable. The main attraction to PB currently is 4x4ing and fishing on the beach and the demographics appear to me to mainly be young adult men or young working-class families looking for a low-cost weekend away from the city but not too far. It is different to the demographic who goes to Dunsborough for \$150 winery lunches and 5-star resort stay.
- N/A
- no
- when we drive on the beach as a club the amount of fishing wire and hooks left lying around and other general rubbish which we take away and dispose of properly
- No
- Camping areas and dunes are swamped with ticks. Not sure what can be done about this.
- Keep up the good work.
- at this time, no
- Keep up the good work Team.
- to many places are being closed off because of one or two opinionated people with a bit of pull.
- Well managed, do not change it.
- Leave it open!!
- Not really as I don't live there, but that doesn't mean we don't care. ❤️
- Idiots taking their F w d out of f w d out of f.w.d to two-wheel drive and ripping up the beach.
- See my comments on number seven.
- No
- It's critical that the managers (law makers) consider that they have a fantastic facility for the whole population including visitors who spend money in Shire.
- Council and volunteer Rangers doing good job. Need more involvement by paid Council Rangers.
- Ranger appears to police things well.
- The foreshore needs regular radar detection for speeders in combination with the police which can be done on the beach. Maybe time for some of the current Rangers to retire and put in people who will police better.
- Need to involve the public in setting/enforcing correct usage of beach and 4x4 access. Use of Technology to keep standards high. Think modern and education of the younger user. Get young drivers involved.
- The poles/tyres to stop people driving on the swimming area are temporary and always disappear with winter storms. A more permanent structure should be considered.
- It's a bit unloved and the taps often do not work etc. Needs a new good caretaker.
- The foreshore as it is, is unspoilt, attractive and is a very relaxing place to go. Because of the low numbers of user's minimal management is required. However, management of the 4WD's, off-road bikes, litter together with the on-going management of sensitive areas and conservation sites that form part of the habitat for flora and fauna is important if the foreshore is to retain its uniqueness and attractiveness into the future. The in-situ foreshore photograph site is an important facility to record the action of the ocean



and the wind on the foreshore and foredune systems to enable a better understanding of the impacts if the seasons on beach front. There could be other sites established to inform management practices.

- No
- Natural state is its greatest attribute.
- We had Geoff Stacey who looked after the Dunes for years, at his own expense for most of it. We need to create revenue to ensure the Dunes and Beach are looked after.
- No
- There needs to be a permanent barrier to stop 4-wheel drives going through the swimming area.
- There doesn't appear to be much foreshore management! The PBPA seems to want ownership of any decisions but there should be broader consultation to include the many part time residents and recreational visitors.
- No
- Nil



APPENDIX D  
EPBC PROTECTED MATTERS SEARCH RESULTS  
REPORT





# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 20/01/21 15:35:00

## [Summary](#)

## [Details](#)

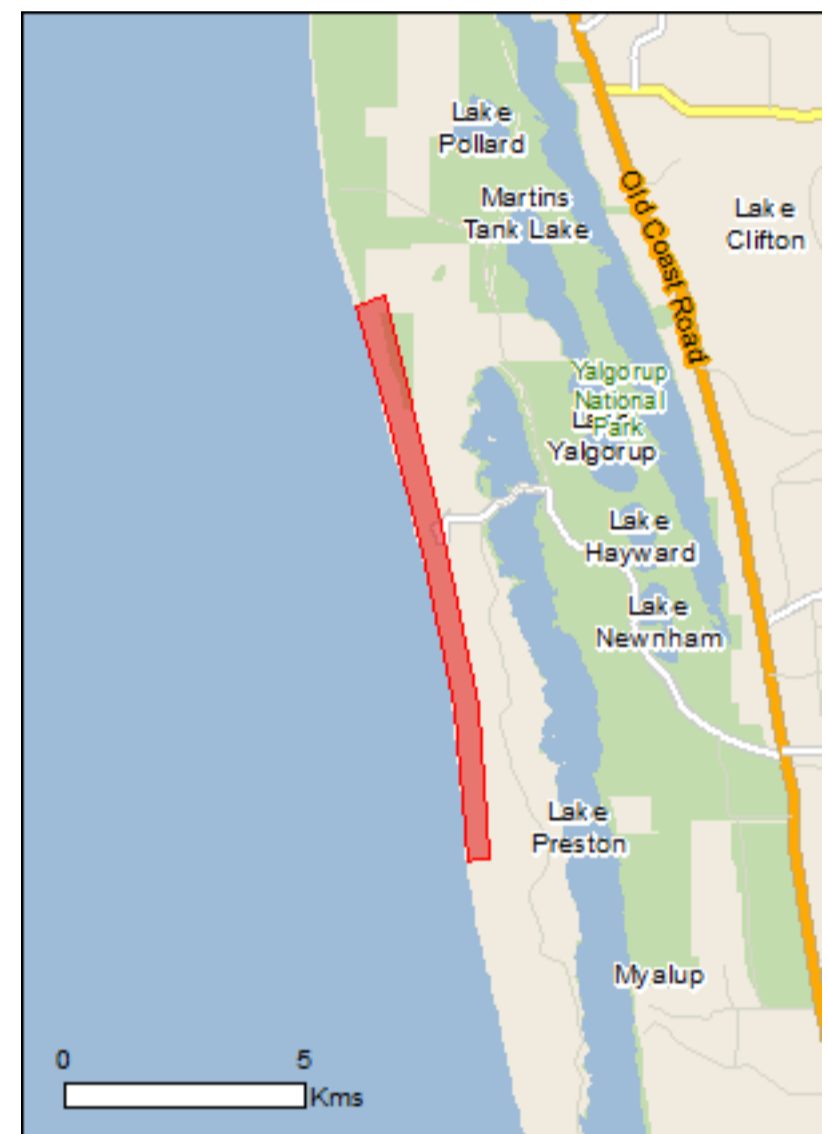
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

## [Caveat](#)

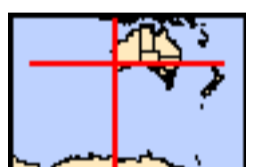
## [Acknowledgements](#)



This map may contain data which are  
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[Coordinates](#)

Buffer: 0.0Km



# Summary

## Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	1
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	2
<a href="#">Listed Threatened Species:</a>	40
<a href="#">Listed Migratory Species:</a>	42

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	64
<a href="#">Whales and Other Cetaceans:</a>	13
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

<a href="#">State and Territory Reserves:</a>	1
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	23
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

### Wetlands of International Importance (Ramsar)

[\[ Resource Information \]](#)

Name	Proximity
<a href="#">Peel-yalgorup system</a>	Within 10km of Ramsar

### Listed Threatened Ecological Communities

[\[ Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
<a href="#">Banksia Woodlands of the Swan Coastal Plain ecological community</a>	Endangered	Community may occur within area
<a href="#">Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community</a>	Critically Endangered	Community likely to occur within area

### Listed Threatened Species

[\[ Resource Information \]](#)

Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Anous tenuirostris melanops</a> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Calyptorhynchus baudinii</a> Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Species or species habitat likely to occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Falco hypoleucos</a> Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
<a href="#">Limosa lapponica menzbieri</a> Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pachyptila turtur subantarctica</a> Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<b>Mammals</b>		
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area



Name	Status	Type of Presence
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area
<b>Plants</b>		
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Drakaea micrantha</a> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
<b>Reptiles</b>		
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<b>Sharks</b>		
<a href="#">Carcharias taurus (west coast population)</a> Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<b>Listed Migratory Species</b>		<b>[ Resource Information ]</b>
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardenna carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Hydroprogne caspia</a> Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Onychoprion anaethetus</a> Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<b>Migratory Marine Species</b>		
<a href="#">Balaena glacialis australis</a> Southern Right Whale [75529]	Endangered*	Breeding known to occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Caperea marginata</a> Pygmy Right Whale [39]		Species or species habitat may occur within area
<a href="#">Carcharhinus longimanus</a> Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Lagenorhynchus obscurus</a> Dusky Dolphin [43]		Species or species habitat may occur within area
<a href="#">Lamna nasus</a> Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
<a href="#">Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
<a href="#">Manta birostris</a> Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat likely to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within

Name	Threatened	Type of Presence area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area

## Other Matters Protected by the EPBC Act

### Listed Marine Species [\[ Resource Information \]](#)

\* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat may occur within area
<a href="#">Anous tenuirostris melanops</a> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat likely to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pachyptila turtur</a> Fairy Prion [1066]		Species or species habitat likely to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area
<a href="#">Puffinus assimilis</a> Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Puffinus carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
<a href="#">Sterna anaethetus</a> Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
<a href="#">Sterna caspia</a> Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thinornis rubricollis</a> Hooded Plover [59510]		Species or species habitat known to occur within area
<b>Fish</b>		
<a href="#">Acentronura australe</a> Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
<a href="#">Campichthys galei</a> Gale's Pipefish [66191]		Species or species habitat may occur within area
<a href="#">Heraldia nocturna</a> Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
<a href="#">Hippocampus angustus</a> Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
<a href="#">Hippocampus breviceps</a> Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
<a href="#">Hippocampus subelongatus</a> West Australian Seahorse [66722]		Species or species habitat may occur within area
<a href="#">Histiogamphelus cristatus</a> Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
<a href="#">Lissocampus caudalis</a> Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
<a href="#">Lissocampus fatiloquus</a> Prophet's Pipefish [66250]		Species or species habitat may occur within area
<a href="#">Lissocampus runa</a> Javelin Pipefish [66251]		Species or species habitat may occur within area
<a href="#">Maroubra perserrata</a> Sawtooth Pipefish [66252]		Species or species habitat may occur within area
<a href="#">Mitotichthys meraculus</a> Western Crested Pipefish [66259]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Nannocampus subosseus</a> Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
<a href="#">Phycodurus eques</a> Leafy Seadragon [66267]		Species or species habitat may occur within area
<a href="#">Phyllopteryx taeniolatus</a> Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
<a href="#">Pugnaso curtirostris</a> Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
<a href="#">Solegnathus lettiensis</a> Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
<a href="#">Stigmatopora argus</a> Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
<a href="#">Stigmatopora nigra</a> Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
<a href="#">Urocampus carinirostris</a> Hairy Pipefish [66282]		Species or species habitat may occur within area
<a href="#">Vanacampus margaritifer</a> Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
<a href="#">Vanacampus phillipi</a> Port Phillip Pipefish [66284]		Species or species habitat may occur within area
<a href="#">Vanacampus poecilolaemus</a> Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Arctocephalus forsteri</a> Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
<b>Reptiles</b>		
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Disteira kingii</a> Spectacled Seasnake [1123]		Species or species habitat may occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<b>Whales and other Cetaceans</b>		<b>[ Resource Information ]</b>
<b>Name</b>	<b>Status</b>	<b>Type of Presence</b>

Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Caperea marginata</a> Pygmy Right Whale [39]		Species or species habitat may occur within area
<a href="#">Delphinus delphis</a> Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area
<a href="#">Grampus griseus</a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
<a href="#">Lagenorhynchus obscurus</a> Dusky Dolphin [43]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Stenella attenuata</a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area

## Extra Information

State and Territory Reserves	[ Resource Information ]
Name	State
Yalgorup	WA



## Invasive Species

[ [Resource Information](#) ]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
<b>Birds</b>		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
<b>Mammals</b>		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within

Name	Status	Type of Presence area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area

# Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

# Coordinates

-32.848241 115.637771,-32.846799 115.643264,-32.882846 115.654079,-32.911529 115.660945,-32.935304 115.663177,-32.935736 115.659057,-32.911673 115.656482,-32.887026 115.650645,-32.865978 115.643779,-32.848385 115.638114,-32.848241 115.637771

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- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
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- [-Tasmanian Herbarium](#)
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- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
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- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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