

Karratha Foreshore Management Plan

Prepared for the Shire of Roebourne by Essential Environmental.

With funding from CoastWest.

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Section 1

Introduction



1. Introduction

Karratha is the key regional centre of the Shire of Roebourne. It is recognised as a coastal tourism and recreation node in the Shire of Roebourne Coastal Management Strategy (draft), 2011.

The predicted increase in population in Karratha as a result of the Pilbara Cities initiative and increased growth in mining will lead to substantial pressure on the coastal environment in the vicinity of the townsite. It is imperative that a Foreshore Management Plan is developed to provide an assessment of the current facilities, levels of access, and protection of cultural and environmental values in light of the likely changes in population and potential impacts of climate variability including sea level rise. This will allow appropriate recommendations to be made which provide for the ongoing sustainable use of the coastal areas while optimising environmental and cultural protection.

1.1 Purpose of this plan

The Karratha foreshore management plan has been prepared to provide guidance for the management of human use impacts on the Karratha foreshore reserve in the Shire of Roebourne (Figure 1). The Karratha Foreshore area covered by this Plan is currently reserved for recreation (amongst other purposes, see section 2.1) and is mostly managed by the Shire of Roebourne.

The Karratha foreshore management plan describes the environmental, cultural, recreational and resource values associated with the site, many of which are under threat from human activities on the coast. The Plan makes recommendations regarding the future management of impacts in order to maintain or enhance the identified values for the long term.

1.2 Implementation of the plan

Specific recommendations for implementation are contained in section 3. It is recognised that further detailed work will be required, including detailed design and costing of infrastructure, to facilitate implementation in some instances.

No commitments have been made as yet regarding the implementation of this foreshore management plan. Its

delivery will depend on the availability of resources and priorities for action determined by the Shire.

It is anticipated that implementation of the adopted foreshore management plan will require the formulation of partnerships and the identification of a variety of sources of funding. The lead agency for implementing this Plan will be the Shire of Roebourne.

1.3 Context for management plan

The foreshore and coastal areas of Karratha are known to be rich sites of cultural significance for the region's traditional owners, the Ngarulma people. There is a strong desire among the Ngarulma people for the opportunity to jointly manage the land so that its environmental and cultural values can be maintained and enhanced into the future.

Population forecasts for Karratha predict a youthful, active population who place disproportionate pressure upon available coastal recreational sites. This significantly increased population will require substantially increased facilities, not only to meet expected demand but to prevent random access to vulnerable coastal areas, together with greater active management of this more intensive and active usage of the coastal area. The protection and management of Karratha's coastal foreshore areas will therefore require the provision of adequate access to selected sites and an appropriate range of recreational facilities.

A management plan is therefore required to provide guidance for the Shire regarding the management of the Karratha foreshore reserve. This plan will also scope the opportunity for diversification and joint management of the reserve with the region's Traditional Owners.

The overarching aims of the Karratha Foreshore Management Plan are to:

1. Contribute to the implementation of local and regional planning objectives and coastal strategies.
2. Consolidate community partnerships and build community capacity and ownership of the area including working with the area's Traditional Owners.
3. Foster the sustainable recreational and tourist use of the area through a plan that protects the environmental and cultural values of the area and identifies access arrangements and long term infrastructure needs.

Shire of Roebourne, Karratha foreshore management plan

Figure 1 - Site location and study area



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1.4 Developing this plan

This foreshore management plan has been prepared in response to discussions with the land's traditional owners, the Ngarluma people, and the community. It contains information from readily available sources including the *Shire of Roebourne Coastal Management Strategy Position Paper* (Landvison, 2011) and *Mulataga Strategic Foreshore Management Plan* (UDLA, 2013).

The values, issues and recommendations are based on the outcomes of a community forum that was held in Karratha on Tuesday 9 April, 2013 at the Frank Butler Community Hall. The workshop was attended by over thirty people representing a range of community organisations and stakeholders, on the basis of an open invitation issued via the Shire website, Karratha newspaper (the Pilbara Echo) and a poster erected at the Karratha boat ramp.

The draft Foreshore Management Plan was advertised for public comment from 11 September to 2 October 2013. Three submissions were received on the draft plan. All comments were considered and appropriate changes were made to the foreshore management plan in response to the comments received. It is noted that all comments were generally supportive of the recommendations of this foreshore management plan.

1.5 Planning and policy context

Key planning and policy context for Karratha is provided by the following documents. Key outcomes and implications are summarised where possible.

Pilbara Planning and Infrastructure Framework (WAPC, 2012)

The *Pilbara Planning and Infrastructure Framework* defines a strategic direction for the future development of the Pilbara region over the next 25 years. It seeks to ensure that development and change in the Pilbara is achieved in a way that improves people's lives and enhances the character and environment of the region.

The *Pilbara Planning and Infrastructure Framework* notes that the region is highly dependent on outdoor sporting and recreation activities and that due to the climate, water plays an important role in recreation facility provision. Recognised popular coastal activities include recreational fishing and diving facilitated by boat ramps in all the major coastal settlements. The popularity of coastal marine recreation is demonstrated by the Pilbara having some of the highest recreational boat ownership in Australia (WAPC, 2012).

Shire of Roebourne Town Planning Scheme No 8

Shire of Roebourne TPS No. 8 (2011) outlines the Shire of Roebourne's planning aims and intentions for the Shire of Roebourne municipal district. It also aims to control and guide land use and development within the district, as well as facilitating community input into planning. The development objectives for Karratha, as defined in Part V of TPS No. 8, are:

- (i) Facilitate the continued growth of Karratha as the regional centre of the West Pilbara.
- (ii) Develop Karratha as the tourist entry for the West Pilbara, built upon and taking into account the levels of commercial travellers associated with resource developments.
- (iii) Preserve the key recreational, landscape and heritage values of the Karratha Hills.
- (iv) Encourage residential development that will accommodate a greater range of lifestyles and needs to reflect the broadening population base.

Karratha City of the North Plan

The Karratha City of the North Plan provides a sustainable growth plan to guide Karratha on its journey from a town with a permanent population of some 18,000 including Fly-In, Fly-Out workers through to a city in excess of 50,000. The City Growth Plan, covers the entire Karratha town site, and includes growth strategies and a phasing plan.

Karratha 2020 Vision and Community Plan

The K2020 Vision and Community Plan, was endorsed by the Shire in 2009. It provides a pathway for the transformation of Karratha from a mining town and service centre to a regional city. The Community Plan identifies the current level of facilities and services and highlights what is necessary to achieve the vision.

Shire of Roebourne Coastal Management Strategy Position Paper (Landvison, 2011)

The *Shire of Roebourne Coastal Management Strategy Position Paper* (Landvison, 2011) sets out the Shire's objectives for the management of its 350km length of coast. The position paper was prepared as an interim step, as a precursor to the development of a comprehensive and final Coastal Management Strategy.

It describes the coastal environments and characteristics, provides for the protection of natural coastal processes and makes recommendations for the management of human impacts within a proposed coastal management framework. Though subject to review, the management framework is proposed to be implemented immediately to administer coastal management in accordance with the principles in the Position Paper.

The Position Paper identifies a series of projects that are recommended to be commenced immediately as interim measures prior to the preparation of Foreshore Management Plans for the designated recreational activity nodes Dampier Foreshore, Hearson Cove, Karratha Back Beach, Cleaverville, Wickham Back Beach, Point Samson/Sams Creek area and Cossack/Settlers Beach.

Mulataga Development Plan

The Mulataga residential project is a West Australian Government backed initiative in partnership with Mirvac and LandCorp, to transform a former sheep station on the eastern edge of the Karratha town site into a new beachside residential community of over 2,000 lots. The project is part of the State Government's "Pilbara Cities" initiative to transform Karratha into a city capable of sustaining 50,000 people.

The Mulataga Development Plan outlines the vision for the development of the Mulataga urban area, consistent with the following objectives.

- Transformation Step By Step - Establishing the foundation for the Karratha of tomorrow today, through key partnerships.
- Aspirational affordability – delivering real housing choices that people aspire to call home.
- Resilience - Creating a sense of permanence, realism and robustness to Karratha by creating a socially, economically and environmentally sustainable place.
- Home - Creating a place of choice, a place where people choose to call home. Nurturing a sense of belonging through fostering the spirit of Pilbara heritage.
- Environmentally Rewarding – A commitment to environmental excellence by capturing the essence of the Pilbara lifestyle and responding appropriately (Mircvac 2012).

The Mulataga Development Plan has been endorsed by the Shire of Roebourne; however has yet to be endorsed by the WAPC. Should any future changes be made to the foreshore reserve, these will need to be addressed in a revision to this foreshore management plan.

State Planning Policy 2.6: State Coastal Planning Policy (2013)

The purpose of the Policy is to provide 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. This policy

recognises and responds to regional diversity in coastal types; requires that coastal hazard risk management and adaptation is appropriately planned for; and encourages innovative approaches to managing coastal hazard risk, and provides public ownership of coastal foreshore reserves.

The policy provides high order guidance for decision making on coastal planning matters and applies state wide. The objectives of this policy are to:

1. ensure that development and the location of coastal facilities takes into account coastal processes, landform stability, coastal hazards, climate change and biophysical criteria;
2. ensure the identification of appropriate areas for the sustainable use of the coast for housing, tourism, recreation, ocean access, maritime industry, commercial and other activities;
3. provide for public coastal foreshore reserves and access to them on the coast; and
4. protect, conserve and enhance coastal zone values, particularly in areas of landscape, biodiversity and ecosystem integrity, indigenous and cultural significance.

Policy measures include clauses relating to:

- Development and settlement;
- Water resources;
- Building height limits;
- Coastal hazard risk management and adaptation planning;
- Coastal protection works;
- Protection of public interests
- Identification of coastal foreshore reserves
- Preparation of coastal strategies and management plans, and
- the precautionary principle.

Karratha Coastal Vulnerability Study

The Karratha Coastal Vulnerability Study (JDA Consultant Hydrologists 2011) presents the results of modelling. It addresses the effects of future climate change, including flooding from storm surge, and considers shoreline stability around Karratha. Of the four coast types identified (Western Nickol Bay, West Karratha, East Karratha and the Nickol River Delta), two are predicted to experience increased sediment transport, the destabilisation of fringing mangroves and breaching of coastal dunes as a result of increased sediment transport from sea level rise (Western Nickol Bay and West Karratha). It is also expected that fringing mangroves located in East Karratha will be destabilised due to rising sea levels, however, due to the rock structure backing the sandy foreshore at this coastal type, potential coastal movement will be constrained.

In general, development in Karratha is not impacted by flooding with most of the existing townsite, Gap Ridge and Baynton West in the west, and the Karratha LIA above the 100yr ARI flood level. The only areas which will be affected are properties along Balmoral Rd between Gawthorne Drive and Warambie Rd, which are subject to some inundation as a result of storm surge. Generally, creek crossings and roadways are subject to some inundation in the 100 year ARI event, and shoreline location around Karratha is predicted to change as a result of sea level rise and climate change. However, no areas are specifically under high threat or risk.

Mulataga Strategic Foreshore Management Plan

The *Mulataga Strategic Foreshore Management Plan* (UDLA, 2013) provides guidance for the future development and management of the foreshore adjacent to the proposed Mulataga development. It contains:

- A vision (a clear statement of overall intent)
- A set of management objectives that guide the vision
- Coastal management guidelines that once implemented will work towards the achievement of the objectives
- A clearly defined implementation methodology

The strategic foreshore management plan proposes the preparation of more detailed foreshore management plan(s), possibly when staged development works are adjacent to the foreshore areas in question and associated designs are prepared and approved in coordination with the Ngarlama people (traditional owners), Shire of Roebourne and associated development stakeholders. It recognises that one of the detailed plans may also include a Coastal Node Management Plan that relates specifically to a potential high community activity area (UDLA, 2013).

This foreshore management plan has been prepared to be consistent with the *Mulataga Strategic Foreshore Management Plan*. It is recognised; however, that the Mulataga Strategic Foreshore Management Plan has yet to be endorsed by the WAPC. Should any changes be made to the plan, this foreshore management plan should be amended to reflect those changes.

Off road vehicles in the Shire of Roebourne (Trail Bike Management, 2012)

The report on Off Road Vehicles in the Shire of Roebourne, by Trail Bike Management, was commissioned by the Shire in response to community concerns regarding off road vehicle use. The report details the concerns, assesses the current situation and makes recommendations for strategies and options to address the issues. A key recommendation is the development of the Millars Road Off Road Vehicle Area, which is already gazetted under the *Control of Vehicle (Offroad Areas) Act 1978*, consistent with the WA State Trail Bike Strategy.

Section 2

Karratha Foreshore - Characteristics



2. Karratha Foreshore - Characteristics

2.1 Location description

The study area for the Karratha Foreshore Management Plan covers approximately 1,800ha, stretching for 12.5km along the Karratha coastline. It is around 3.5 km wide at its fattest point, decreasing to 100m at its thinnest. The area that is the subject of this management plan is that which is currently reserved for Conservation, Recreation and Natural Landscapes, and Parks, Recreation and Drainage in the Shire of Roebourne Town Planning Scheme No 8 (Figure 2).

The foreshore reserve is in the ownership of the State and comprises over 20 lots. Management responsibility for the foreshore reserve rests mostly with the Shire of Roebourne (table 1).

2.1.1 Existing facilities and infrastructure

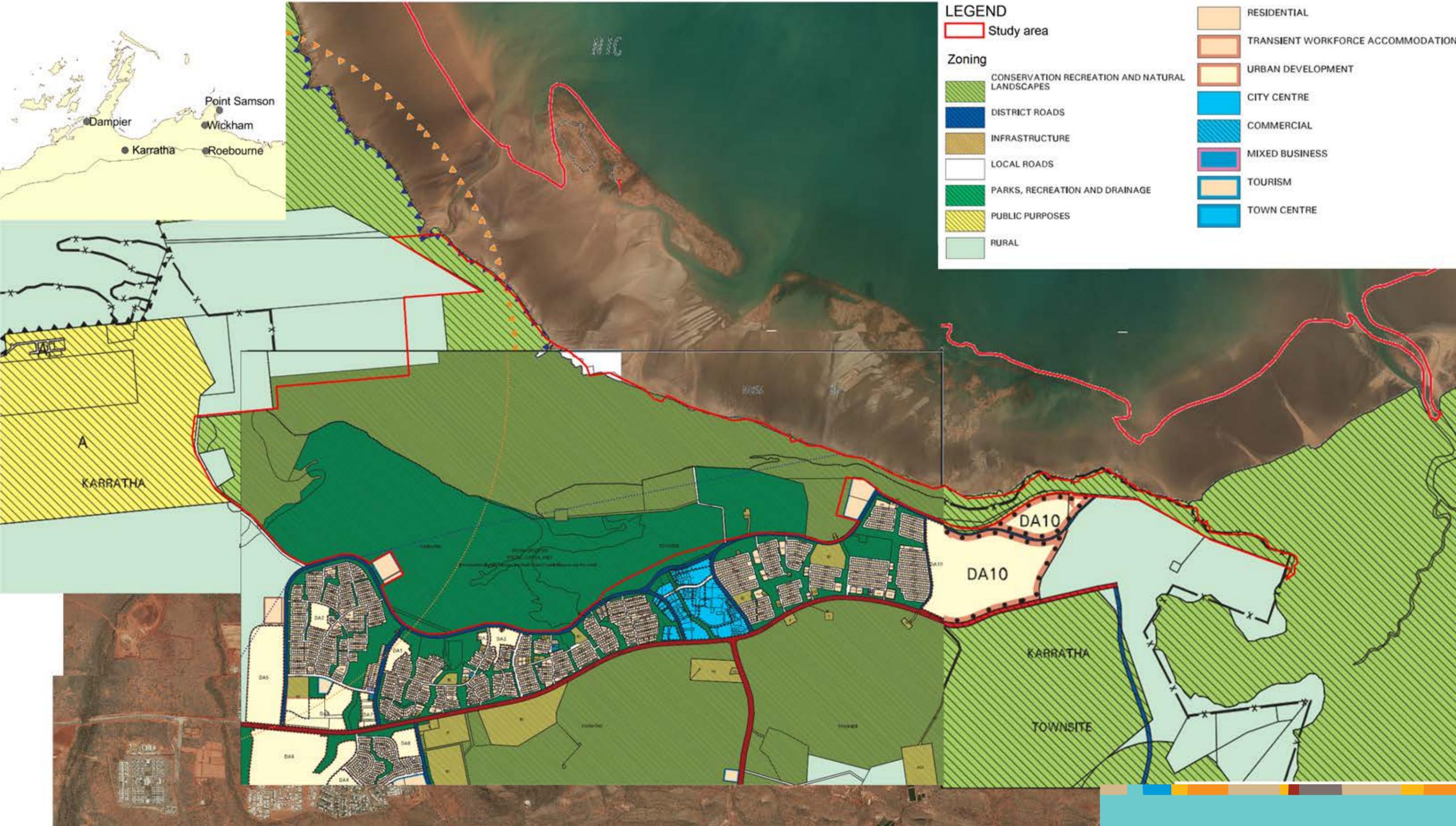
The Karratha foreshore contains only limited facilities and infrastructure. This includes a car park at the end of Searipple Road that contains some signage and bins and a track that provides vehicle access to the beach. Although ropes have been set up to manage access along the top of the dune, they are not enforced and are not a deterrent to vehicle movement.

Table 1: Reserves comprising the Karratha foreshore

Reserve no	Purpose	Management responsibility	Roebourne TPS No 8 Zoning
R36708	Parks & Recreation	Shire of Roebourne	Conservation, Recreation and Natural Landscapes
R34922	Parklands	Shire of Roebourne	Conservation, Recreation and Natural Landscapes
R30872	Golf Course	Shire of Roebourne	Parks, Recreation and Drainage
R35776	Recreation	Shire of Roebourne	Conservation, Recreation and Natural Landscapes
R51015	Harbour purposes	Minister for Transport	Parks, Recreation and Drainage
R34403	Sewage Pumping Station Site	Water Authority of WA	Public Purposes
R33134	Motor cycle & motor vehicle racing	Shire of Roebourne	Conservation, Recreation and Natural Landscapes
R40206	Quarry	Shire of Roebourne	Conservation, Recreation and Natural Landscapes
Various	Unallocated crown Land	Department of Lands	Conservation, Recreation and Natural Landscapes

Shire of Roebourne, Karratha foreshore management plan

Figure 2 - Town Planning Scheme No. 8



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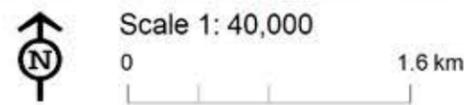




Plate 1: Bins and rope at car park at Searipple Road



A boat launching facility and groin are located towards the eastern end of the proposed Mulataga development at the Karratha Back Beach, situated at the end of Mystery Rd. This facility is only able to be used on particular tides and provides for small to medium craft. The beach behind the boat launching facility acts as a car park for cars and boat trailers. There are also shelters with a table and seating and rubbish bins.

There are numerous vehicle tracks that traverse the foreshore, both along the beaches and mudflats and over the dunes. These tracks demonstrate the significant uncontrolled access that occurs within the Karratha foreshore area.



Plate 2: Signage and shelters at Karratha Back Beach



2.1.2 Climate

Climatic conditions influencing the foreshore environment are representative of a hot, semi-arid climate. Average annual rainfall is approximately 289mm, the majority of which results from scattered thunderstorms and occasional tropical cyclones during the summer period between January and March. A secondary peak in the rainfall occurs in June as a result of rainfall from tropical cloud bands.

Winds in Karratha are characterised by dominant westerly winds occurring throughout summer and prevailing easterly winds in the winter.

The Pilbara coast has one of the highest frequencies of cyclones in Australia, averaging one event every two years. The typical cyclone season runs from mid-December to the end of April, peaking in February. During the tropical cyclone season coastal areas, including Karratha, can be subject to storm surge and inundation, which can be exacerbated with coinciding high tides (Shire of Roebourne, 2010).

Recent work by the CSIRO and the Climate Commission (Steffen, 2011) suggests that temperature, rainfall and storm event patterns have significantly changed in Western Australia in recent decades. The Pilbara has seen an increase in average temperatures, and rainfall patterns have become more variable, with more frequent and intense storm events. These changes are likely to result in significant impacts on biodiversity, water resources and coastal infrastructure.

2.2 Environmental values

2.2.1 Landscape

The significant area that comprises the Karratha foreshore contains a variety of landscapes including mudflats and mangroves, rocky headlands and sandy beaches.

The near surface geological formation of the Karratha area predominantly comprises alluvial sand, silt and clay deposited on floodplains and in the dry creek along the eastern boundary of the townsite. There is a presence of wind-blown eolian sand deposited at the north western fringes of the area and sand, silt and clay in distal outwash fans within the south western end (Shire of Roebourne, 2010).

The foreshore area is relatively flat, particularly along the mudflats of Nickol Bay, although some dunes exist at the eastern end of the foreshore, extending west along to Searipple Rd. The primary dune varies in height from

around 8m AHD up to around 15m AHD. This dune is a dominant feature of the coastal landscape and represents a significant protective barrier against inundation as a result of elevated ocean levels.

The Department of Environment Regulation Acid Sulfate Soil (ASS) risk mapping indicates that the majority of the foreshore environment is mapped as moderate to low risk of ASS occurring at depths of greater than 3 metres. Sections of the foreshore environment in the north-west and north-east, which is inclusive of the intertidal mangrove communities, has been mapped as high to moderate risk of ASS occurring at depths of greater than 3 metres.

Rainfall shed from the Karratha Hills flows predominantly northwards through the town site towards the coast via a comprehensive network of creeks. These creeks are seasonal and for most of the year remain dry but their flows sustain both the salt water marshes/flats and fringe mangals along Nickol Bay and therefore have important significance to the ecology of the area.

2.2.2 Flora and fauna

The Karratha foreshore is situated in the Roebourne subregion of the Pilbara bioregion. The dominant vegetation in the foreshore comprises dwarf shrub steppe of *Acacia stellaticeps* or *A. pynrifolia* and *A. inaequilatera* along the dunes, with the remaining areas containing tidal mudflats and mangroves.

The EPBC Protected Matters Search Tool identified a range of migratory birds and other fauna that may be present in the foreshore area (Appendix 1) although existing searches did not identify any known occurrences of protected flora or fauna in the foreshore reserve. The mangrove systems in the sandy embayment of Nichol Bay are, however, recognised as important marine habitat and are also habitat for the Dugong and Flatback Turtle.

Mangrove habitats form a highly productive part of the coastal foreshore ecosystem. Mangrove habitats and intertidal areas provide foraging and feeding habitat for a range of conservation significant fauna species, including species of bat, migratory bird species, sea snakes and other reptiles, marine associated crustaceans and fish species. There are few places in the world where mangroves occur in arid conditions and as such the mangroves along the Karratha coastline are considered regionally significant arid zone mangroves (Shire of Roebourne, 2010).

The importance of mangroves as habitat is recognised by the Environmental Protection Authority (EPA) in their *Guidance Statement No. 1: Protection of Tropical Arid Zone Mangroves along the Pilbara coastline* (EPA 2001), which addresses the protection of tropical arid zone mangroves, habitats and dependent habitats along the Pilbara coastline from Cape Keraudren to the Exmouth Gulf. This guideline identifies that the majority of the mangrove community located in the Karratha foreshore area is considered to be a “mangrove of high conservation value”. Any development must therefore be planned and designed to keep impacts on mangroves, habitats and dependant habitats to a minimum practical level.

Two wetland areas have been identified within the foreshore reserve as having the potential for conservation significance. These wetland areas are not formally listed. However, their conservation significance has been recognised by a highly respected botanist from the local community.

2.3 Cultural values

2.3.1 Aboriginal heritage

Native Title within the Karratha foreshore area has been formally recognised as residing with the Ngarluma people. It is understood that ‘the Ngarluma people are the original inhabitants of the coastal areas around Roebourne (West Pilbara WA). Archaeological surveys reveal that continuous occupation & ancestry stretches back more than 30,000 years, and important cultural sites such as the rock art on the Burrup Peninsula (Karratha) show a deep historical and spiritual connection to the land, waterways & rivers & the sea’ (NAC, 2013)..

Part of the foreshore area is subject to an Indigenous Land Use Agreement between the Ngarluma Aboriginal Corporation and Rio Tinto Iron Ore for Development, Industrial, Mining and Infrastructure, while the remainder is part of the determined claim area. Any other proponents working in Ngarluma Country must negotiate Heritage Protection Agreements or Indigenous Land Use Agreements with the Ngarluma Aboriginal Corporation directly prior to commencing works..

The foreshore area contains a number of important cultural sites, some of which are registered with the Department of Aboriginal Affairs. The registered sites are located within Nickol Bay, along the foreshore adjacent to the proposed Mulataga development and at the eastern end of the foreshore, known as Mystery Road sandpit (Figure 3). A burial site has also been located in the dunes to the north of the quarry.

It is important to note that the cultural values associated with the foreshore environment are not represented only by the registered sites. The land and water environment of coastal areas contains many sustaining values associated with the use and enjoyment of the land that are important to the region’s Traditional Owners.

As well as the broader cultural values associated with the landscape, there is potential for Aboriginal sites within this area that are not currently registered. Unregistered Aboriginal sites are also protected by the *Aboriginal Heritage Act (1972)*. Any future development within the area requires consultation with the Ngarluma Aboriginal Corporation and the conduct of appropriate Aboriginal Heritage Surveys to locate and record Aboriginal sites.

A visit to country and a tour of significant heritage sites was undertaken with Ngarluma elders, traditional custodians of the Karratha region, on 30th May 2013. Fishing and crabbing were identified as the major activities undertaken within the foreshore area, particularly within the mangroves lining the shore, and off the beach and rocky outcrops using nets and fishing lines.

A variety of edible and medicinal plants were identified as growing throughout the foreshore area and regularly gathered. While the Burrup peninsula was recognised as the most important and major heritage site within the Karratha area, heritage values within the dunes lining the foreshore were acknowledged as likely burial sites.

Concern was expressed by the Ngarluma elders regarding the proximity and expansion of quarry mining sites to these dunes and the shoreline in general. The increase in 4WDs, quad bikes, rubbish (particularly burnt out car bodies), camping by backpackers and over-fishing in the Karratha foreshore was recognised as a result of population growth and a frustrating but inevitable trend. This trend was observed to cause Ngarluma people to fish and camp further and further away from the Karratha foreshore area to avoid crowds, camp in peace and find more easily obtainable fish.

Additionally, the prevention by Shire rangers of cooking traditionally by campfire in the area was also voiced as an upsetting issue that required resolution. Communication with Shire rangers, however, indicated that camp fires for cooking were generally allowed under a number of conditions and in most areas surrounding Karratha. The Shire rangers indicated that they would communicate directly with the Ngarluma Aboriginal Corporation to help resolve this issue.

Shire of Roebourne, Karratha foreshore management plan

Figure 3 - Aboriginal heritage



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Scale 1: 40,000
 0 1.6 km

2.3.2 Natural heritage

The Dampier Archipelago Marine Area, which bounds the Karratha foreshore to the north, is listed on the Register of the National Estate. The marine environment surrounding the Dampier Archipelago is internationally recognised for its rich and varied fauna life which includes species that are rare or endangered, including the humpback whale, dugong, types of algae and seabirds. The region is also one of the world's few major turtle breeding areas which is not subject to major pressures on turtle populations.

The Register notes, however, that many reef fish such as coral trout, green crayfish, etcetera are potentially endangered by recreational pressure, and that important wilderness values are being lost due to increasing human intrusion. This includes the erosion of aesthetic values related to the natural beauty of the marine and terrestrial environments.

2.4 Recreational values

The Pilbara community and its visitors highly value their outdoor recreational activities, particularly those that are related to the ocean. Activities undertaken in the Karratha foreshore area include:

- Fishing
- Boating
- Swimming and diving
- Walking/jogging
- Golf course
- Off road vehicles



2.4.1 Fishing

Fishing is a highly popular activity within the Karratha foreshore, particularly within the mangroves where people also go in search of mud crabs, cockles and trumpet shells (UDLA, 2012). Unfortunately this favoured past time results in impacts on the mangroves from vehicle access and substantial littering, including the abandoning of vehicles that have become bogged in the treacherous conditions.

2.4.2 Boating

Access to the water or boats is provided by the boat launching facility at Karratha Back Beach. This facility is constrained, however, as it can only be used in certain tides and is often impacted by silt.

With the forecast increase in population and the restricted window that the boat ramp can be used, the Karratha Back Beach boat facility may require upgrading in the near future.



Plate 3: Fishing occurs off the beach, the groin and in open water



Plate 4: The Karratha Back Beach boat ramp can only be used in certain tides



2.4.3 Swimming and diving

Although the foreshore comprises large areas of mangroves including those adjacent to the Mulataga development and at the Back Beach, some locals and tourists are still known to swim along the sandy stretches.

The aquatic marine environment also supports a unique flora of sponge gardens, which can only be observed during specific times of the year. Viewing these sponge gardens has been reported as a unique and special recreational activity for the locals (UDLA, 2013).

2.4.4 Walking/jogging

The Karratha foreshore area is an important recreational area for walking and jogging. There are numerous tracks that cross the mudflats and exist along the beach that are used for jogging, walking and dog-walking. These tracks are not well defined, however, and are also used by four-wheel drives and off road vehicles, creating a significant safety issue for pedestrians.

2.4.5 Golf course

The Karratha Country Club incorporates the Karratha Golf Club and Karratha Indoor Cricket Club. The Karratha Bowling Club is also located close by. The Karratha Country Club is managed by the Karratha Country Club

Board. The Golf Course contains 18 holes, sand greens and grass fairways with plans to grass the greens within two years (Karratha Country Club website).

2.4.6 Off road driving

Off road driving and motor biking are significant activities within the Karratha foreshore area. The level of activity of off-road vehicles has increased dramatically over the last few years, as riders are engaged in both the recreational sport as well as the use of off-road vehicles to obtain access to remote areas for fishing and camping. This has resulted in a number of issues relating to safety and reduced amenity of both the townsite but also across the mudflat areas. Safety issues relate not only to pedestrians, but also to users, particularly where trails and tracks are uncontrolled.

The report on Off Road Vehicles in the Shire of Roebourne, by Trail Bike Management (2012), investigated concerns raised by the community regarding off road vehicle use in Karratha. It provides recommendations within a framework of engineering, education, enforcement and engagement, highlighting the need to develop a masterplan for an off-road vehicle area at Millars Road.

2.5 Resource values

2.5.1 Sand extraction

A tenement currently exists for the extraction of construction materials from the sand dunes to the east of the Karratha Back Beach by Karratha Earthmoving and Sand Supplies. This tenement expires in 2030. It is understood that sand may continue to be mined to the extent and life of the tenement.

Sand extraction has, in the past, unearthed Aboriginal remains and has the potential to destroy or adversely affect archaeological relics. Some of the sites where this is known to have occurred include Nickol River, Cape Lambert, Point Samson, and Karratha Back Beach. Indiscriminate (illegal) removal of sand also occurs on numerous sites where access is uncontrolled, usually for minor domestic construction and garden landscaping. Both licensed and indiscriminate extraction has the potential to degrade dune systems.

Site selection for proposed quarrying activities must have regard to localised coastal processes. The approval of such quarries on beaches or primary dune systems should be discouraged. Primary dunes are frequently altered during cyclones and offer some protection to inland areas and towns such as Karratha during periods of high-energy storm activity.

Some concern has been expressed by the community regarding the nature and extent of sand mining in the area. Any extractive industries located over Crown land are determined by the Minister for Mines and Petroleum under the Mining Act 1972.



Plate 5: Sand mine at Mystery Road

Section 3

Managing Recreation



3. Managing Recreation

Recreational activities within the Karratha foreshore area are largely uncontrolled as, with the exception of the boat ramp, there are no formally designated recreation areas or facilities. Due to the recent expansion of the Karratha population and the significant increases that are predicted in the future, there is a need to provide a robust management framework that includes the region's Traditional Owners, which caters for the recreational needs of the community and visitors.

3.1 Issues

As highlighted in section 2, the key recreational activities within the Karratha foreshore area include boating, fishing, swimming, walking/jogging and off-road driving/motor biking. Although these activities can all result in impacts on the environment, including from rubbish and litter and the proliferation of weeds, it is recognised that the most noticeable impacts arise from uncontrolled access to the foreshore.

3.1.1 Access

There is limited control over pedestrian and vehicular access and the resultant network of tracks across the mudflats are testament to a high level of usage. There are no signs that indicate the preferred access routes and no differentiation is made regarding pedestrian or vehicle pathways.

Uncontrolled access over the dune east and west of the Back Beach is significantly affecting the stability of the dune. Tracks over the dune are sometimes located within 10m of each other and in many instances, the loss of dune height is noticeable. This primary foredune provides protection against ocean inundation from storm surge. The erosion of these dunes reduces the level of protection they afford to the land behind and this may eventually lead to increased flooding within the Karratha townsite if left unmanaged.

This possibility is identified in the *Mulataga Development Plan*, and it is understood that resolution of the appropriate management response will occur as part of the process of obtaining endorsement of the *Mulataga Development Plan* by the Western Australian Planning Commission. As noted in section 1.5, any changes in the *Mulataga Development Plan* or *Mulataga Strategic Foreshore Management Plan* (UDLA, 2013) will need to be reflected in a revised version of this foreshore management plan.

There is a need to provide dedicated pathways for pedestrian and vehicles that allow for appropriate recreational use, while protecting and enhancing the important cultural and environmental values of the area.



Plate 6: Tracks over the foredune resulting in loss of vegetation and destabilisation



Plate 7: Car bodies and rubbish are found across the foreshore area



3.1.2 Rubbish and litter

Although bins are provided at the Back Beach and at the car park at Searipple Drive, the dumping of rubbish and indiscriminate littering are a significant issue for the Shire.

The Shire provides municipal waste management services including a weekly collection, and is working with the community to reduce incidences of littering and rubbish dumping through their 'On-Line Litter Report Form' which is located on the Shire's website. The On-Line Litter Report Form encourages the community to report all illegal litter and dumping activity and all reports are taken seriously.

3.1.3 Degradation of the environment including proliferation of weeds

Uncontrolled access results in a loss of vegetation, particularly in the soft sandy soils of the sand dunes. Where the vegetation is impacted, this provides an opportunity for the colonisation of these areas by weeds.

Despite the evidence of unrestricted access and rubbish dumping, the Karratha foreshore area is currently not displaying a large population of weed species.

3.2 Recommendations

The following recommendations are made in response to the identified impacts of recreational use of the Karratha foreshore, having considered information provided by key stakeholders and the community.

It is recognised that further detailed work will be required, including detailed design and costing of infrastructure, to facilitate implementation in some instances.

The recommendations have been made in order to achieve the following objectives:

- Protect, maintain and where possible, enhance the environmental and cultural values of the site which underpin the enjoyment and usage of the Karratha foreshore by Traditional Owners, residents and visitors.
- Provide for a range of active and passive recreational activities and experiences appropriate to the coast without compromising the cultural and environmental values of the area
- Manage impacts through improved delineation of tracks, conservation and recreational areas, supported by appropriate signage.

3.2.1 Clearly designate areas for conservation and recreation

There are substantial areas within the Karratha foreshore area that have significant environmental and cultural values. These include:

- The mangroves and mudflats of the Nickol Bay area
- The wetland area to the north of Balmoral Road
- The mudflats to the south east of the golf course
- The dunes to the west and east of the Karratha Back Beach

Areas for recreation include:

- Dedicated off-road vehicle area
- Walking/running tracks
- Dual-use path along the top of the foredune. This will replace the existing vehicle track.
- Boat ramp
- Car parks with associated shelters and bins

All areas are to be clearly designated through appropriate signage and fencing, as indicated in figures 4 to 14.

It is recommended that the beaches and mudflats, with the exception of the Back Beach, are closed to vehicular access. This will require a substantial education campaign to alert the community to the changes, and bollarding or closure of a number of access routes.

3.2.2 Improve facilities and infrastructure

There is a need to clearly define the types of recreational activities that are permitted within the foreshore area as the current system of unrestrained use is impacting significantly on the environmental and cultural values of the area.

It is recognised that the additional facilities will require management and maintenance by the Shire of Roebourne. In order to minimise this resource burden on the Shire, the following low-cost, low maintenance activities are recommended.

Dual use path

It is recommended that a dual use (pedestrian and cycle) is constructed along the top of the foredune between the car park on Searipple Rd and Karratha Back Beach. This path should have a low fence to the seaward side, to deter access over the dunes.

Walk trail

A walk trail is to be designated along the length of the Karratha foreshore. Limited infrastructure is recommended, although in some areas, crushed limestone or gravel may be required to provide safe passage or assist with delineation. Other parts of the trail should be designated with signage.

It is noted that the walk trail crosses areas that are susceptible to inundation: outside the golf course through the mangroves, and across the “mouth” of Pegs Creek (Figure 5). Although boardwalks are depicted in these areas, the Shire may determine an alternative way of providing safe access through these areas as part of future detailed design and costing activities.

It is recognised many trails already exist and are predominantly used by 4WDs. It is recommended that bollards or other obstructions such as wheel stops or rocks and signage is provided to deter future usage by vehicles.

Running track

In order to cater for more active recreation it is proposed that a running track is established within the conservation area, commencing at the Balmoral Holiday Park and running in a loop past the conservation wetlands. The surface of the track should be investigated with the aim of being low cost, low maintenance but safe for joggers. Toilets are also proposed at the entrance together with an additional car park.

Car parks, shade, seating and lighting

A number of car parks are proposed to be constructed. This is to facilitate a high level of access to the coast, while containing impact of vehicles. Car parks are proposed to be constructed to hold between 16 and 30 bays, in a manner that allows appropriate stormwater management. In some areas, shade shelters with seating are proposed, with bins and signage, as indicated in table 2. All structures are to be constructed to appropriate cyclone standards and materials.

Off road area

The closure of beach to 4WD access will require the identification of alternative areas for off-road vehicle use. As previously stated, the *Off Road Vehicles in the Shire of Roebourne* study (Trail Bike Management, 2012) recommends the development of the Millars Road Off Road Vehicle Area, which is already gazetted under the *Control of Vehicle (Offroad Areas) Act 1978*, consistent with the WA State Trail Bike Strategy. It is recommended that action continue with regards to the masterplanning, design and construction of this area.

Table 2: Proposed infrastructure for the Karratha Foreshore area

Node	Car park size	Shade shelters	Bins	Other facilities
1. Balmoral Rd	16 to 20 bays	None	1	Public toilets, signage explaining track system and conservation/flood prone area
2. Pegs Creek	12 to 16 bays	2	1	Dedicated walk track to beach. Signage regarding conservation area and track system.
3. Golf course	Utilise existing	None	None	Boardwalk through mangroves and signage
4. Searipple Rd	20 to 24 bays	2	2	Defined beach access with steps, commencement of dual use path to the east, signage, solar lights along path
5. Maitland Rd	12 to 16 bays	2	1	Dual use footpath with solar lighting
6. Mulataga Creek	12 to 16 bays	2	1	Dual use path with solar lighting. Small viewing platform with interpretive signage.
7. Karratha Back beach	Trailer parking for 20 plus 20 car bays	2 additional	4	Fish cleaning table and dedicated bin. Signage
8. Mystery Rd	None	None	None	Walk trail past the quarry. No 4WD access along beach to the east
9. Nickol River	None	1	None	Signage regarding environmental and cultural values and take rubbish away



Plate 8: Motor biking and off-road vehicle use is common

Signage

Signage is an important educational tool. It provides information that will be used by the community and visitors to guide their behaviours. There are a number of signs that are recommended to be placed around the foreshore area at strategic locations and along access paths to the beach to provide residents and the general public with information on the local environment and native flora and fauna. These signs should include the following text:

- Conservation and flood prone area. Access restricted
- Keep off the dunes. Rehabilitation area
- Track closed. Access restricted
- Walk trail
- Beach closed to vehicles

Other signage is recommended at key locations to provide information on the environmental and cultural values of the area. It is recommended that cultural signage in both English and Ngarluma language is provided to explain the cultural significance of the area to the Ngarluma people, and suggest appropriate practices or behaviour to observe when in the area. In particular, signage should be included at the Back Beach boat ramp explaining the cultural significance of the islands nearby to Karratha to the Ngarluma people. The location and wording for signage should be prepared in collaboration with the Ngarluma Aboriginal Corporation and considered by the Ngarluma Elders.

Back Beach Boat ramp

Two shade shelters currently exist at the Karratha Back Beach boat ramp. Due to the number of people using this facility, it is recommended that an additional 2 shelters are also constructed, together with a fish cleaning table. Additional bins should also be provided, including a bin dedicated for fish offal.

Shire Rangers will ensure that regular communication is maintained with the Ngarluma Aboriginal Corporation (Heritage Manager) regarding Aboriginal rights to prepare camp fires for cooking, under certain conditions and areas surrounding Karratha. Shire Rangers will provide brochures and posters detailing camp fire rights for display in the Ngarluma Aboriginal Corporation office and contact details in case of enquiry.

As access to the Back Beach allows vehicles to drive onto the beach, it is recommended that 4WD access is permitted along this stretch of beach to the quarry. In order to ensure appropriate safety for users, the walk trail will not be continued through this section. The 4WD track will consist of a loop along the beach and back behind the dune along the existing track. Access over the dunes will not be permitted and revegetation and fencing is likely to be required in the interim. Bollards or wheel stops are likely to be required at the eastern end of the track.

Consideration should also be given to the enlargement of the Back Beach Boat ramp so that it is able to be used at all times. This will require the development of a concept plan together with the community, followed by a detailed assessment of impacts and design response together with costs. The current silting issue should be addressed in the short term.

Mulataga Coastal Node

The Mulataga Development Plan identifies the possibility of a coastal node along the Mulataga foreshore (UDLA, 2013). This foreshore management plan recognises this opportunity and it is noted that further detailed planning for this area will occur at a later date. The other recommendations contained in this report are consistent with the *Mulataga Strategic Foreshore Management Plan* (UDLA, 2013).

3.2.3 Manage litter and rubbish dumping

The management of rubbish and litter is a significant issue across the Karratha townsite including the Karratha foreshore. There is a need for improved education at all levels, that the dumping of rubbish and litter is inappropriate.

As stated previously, the Shire provides municipal waste management services including weekly rubbish collection, bins and access to land fill. There is therefore no reason for the high level of litter and rubbish dumping that occurs. It is recommended that the Shire work with the Keep Australian Beautiful Council to improve the level of awareness of the impacts of littering. In addition, the Shire should partner with the Department of Parks and Wildlife and Citic Pacific mining to encourage the expanded delivery of their "Leave No Trace" induction program for contractors and staff of other mining and resource companies in the region. Consideration should also be given to commencing a Tidy Towns campaign.

Some additional bins have been recommended to be installed at the newly created car park, as well as a designated bin for fish offal at the Back Beach boat ramp.

3.2.4 Revegetate degraded areas

The Karratha foreshore contains a number of important vegetation complexes and landform types, most notably the mangroves. Although access has impacted on areas of mangroves, the dynamic environment in which they live does not require active revegetation or weed management. It is anticipated that the controlling of access through these areas will improve their condition.

There is a need, however, to revegetate the degraded areas of the foredunes that have been impacted by vehicle tracks by rebuilding these important communities and stabilising the foredune system.

3.3 Implementation

The recommendations of the Karratha Foreshore Management Plan are to be undertaken by the Shire of Roebourne in partnership with the Traditional Owners, with assistance from the community and other stakeholders.

It should be noted that any ground disturbing works will require Aboriginal Heritage Surveys and Section 18 Applications where necessary to meet with the requirements of the *Aboriginal Heritage Act (1972)*. Aboriginal Heritage Monitoring may also be required during the undertaking of the ground disturbing works if heritage sites are identified. Cultural Heritage Management Plans should be produced after the Survey work has been completed and all the Aboriginal sites have been located.

Recommended actions are summarised in table 3. It is recognised that further detailed work will be required, including detailed design and costing of infrastructure, to facilitate implementation in some instances.

3.4 Monitoring and review

It is recommended that the implementation of this Foreshore Management Plan is audited annually and outstanding actions incorporated into the Shire's asset management program.

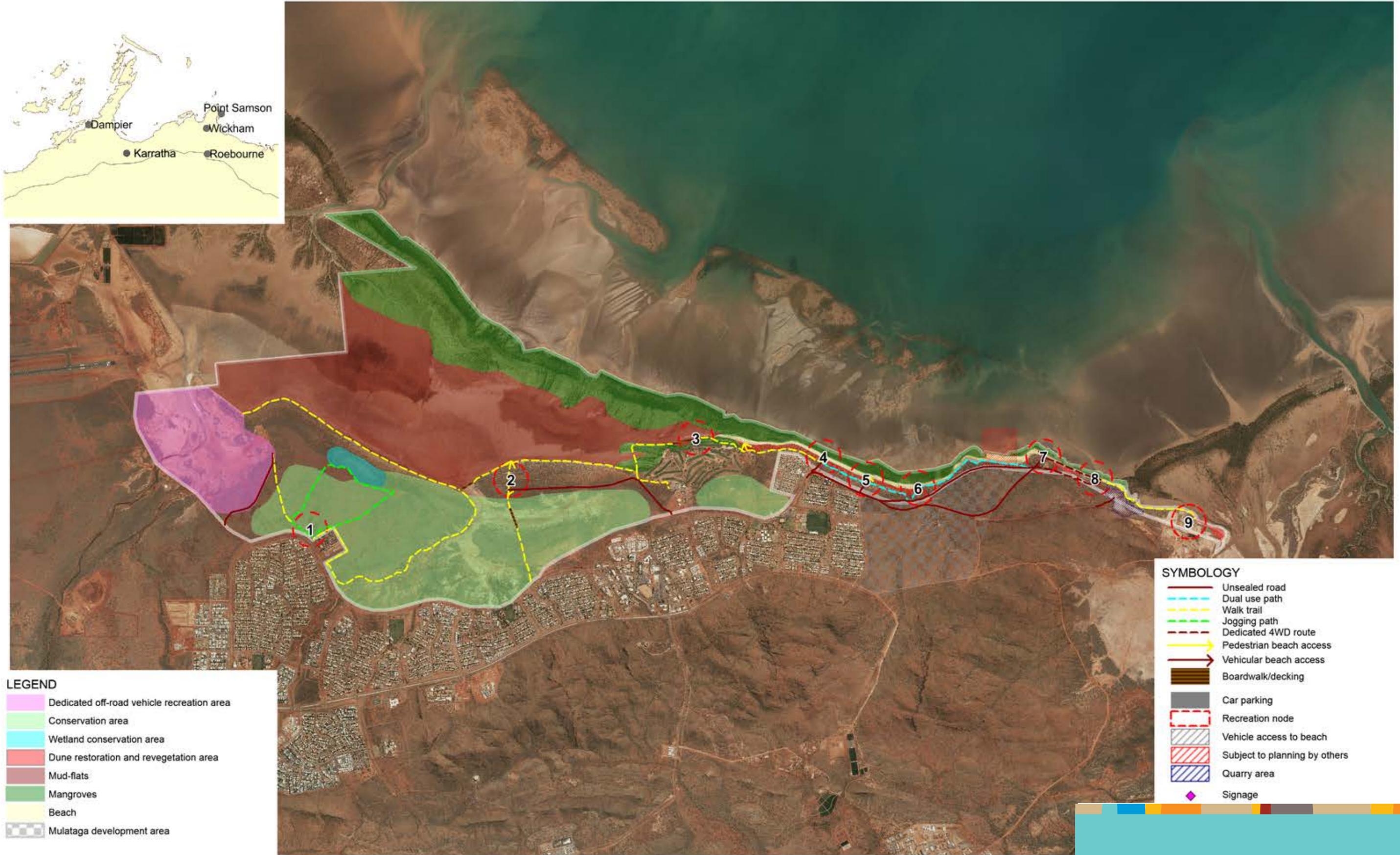
The effectiveness of the Foreshore Management Plan should be reviewed in 5 years and updated as required.

Table 3: Recommended actions for implementation

Recommendation	Location	Priority
Establish joint management framework for implementation actions and ongoing management between the Shire and the Ngarluma people	Karratha Foreshore	High
Construct dual use path (cycling and walking) and close access to vehicles	Along top of dunes between (4) Searipple Rd and (7) Back Beach	High
Designate walk trails along existing tracks and close paths to vehicles	Throughout conservation area and between the Off-Road vehicle area and (4) Searipple Rd	High
Construct car parks	(1) Balmoral Rd, (2) Pegs Creek, (4) Searipple Rd, (5) Maitland Rd, (6) Mulataga Creek, (7) Back Beach	1, 5 High 2,4,7 Medium 6 Low
Provide shelters and seating	(2) Pegs Creek, (4) Searipple Rd, (5) Maitland Rd, (6) Mulataga Creek, (7) Back Beach (9) Nickol River	4 High 2, 7 Medium 5, 6, 9 Low
Construct lookout and playground	(2) Pegs Creek, (6) Mulataga Creek	Low
Incorporate Aboriginal culture and environmental education through installation of interpretive signage	All nodes but particularly (1) Balmoral Rd, (2) Pegs Creek, (4) Searipple Rd, (9) Nickol River	Medium
Provide appropriate signage to control access and activities	Throughout FMP area	High
Obtain funding for detailed planning, design and construction of the Millars Rd Off-Road Vehicle Park	Millars Road	High
Undertake de-silting maintenance works at the Back Beach boat ramp	Back Beach	High
Undertake study to scope, design and deliver required upgrades to the boat launching facility	Back Beach	Medium
Provide formal access for 4WD onto the beach including fencing and hardstand, as well as bollards at the eastern end	Back Beach	Low
Provide dry composting toilets	(1) Balmoral Rd	Medium
Provide fenced pedestrian access to the beach	(4) Searipple Rd, (5) Maitland Rd, (6) Mulataga Creek	Low
Establish walk trail/ jogging path	(1) Balmoral Rd	Medium
Rehabilitate dunes and closed tracks	As required	Medium
Undertake weed management	Particularly along closed tracks	Low
Improve education regarding littering	Karratha townsite	Medium
Work with the State Government regarding the Mulataga Coastal Node	Mulataga	Ongoing

Shire of Roebourne - Karratha foreshore management plan

Figure 4 - Plan overview



- LEGEND**
- Dedicated off-road vehicle recreation area
 - Conservation area
 - Wetland conservation area
 - Dune restoration and revegetation area
 - Mud-flats
 - Mangroves
 - Beach
 - Mulataga development area

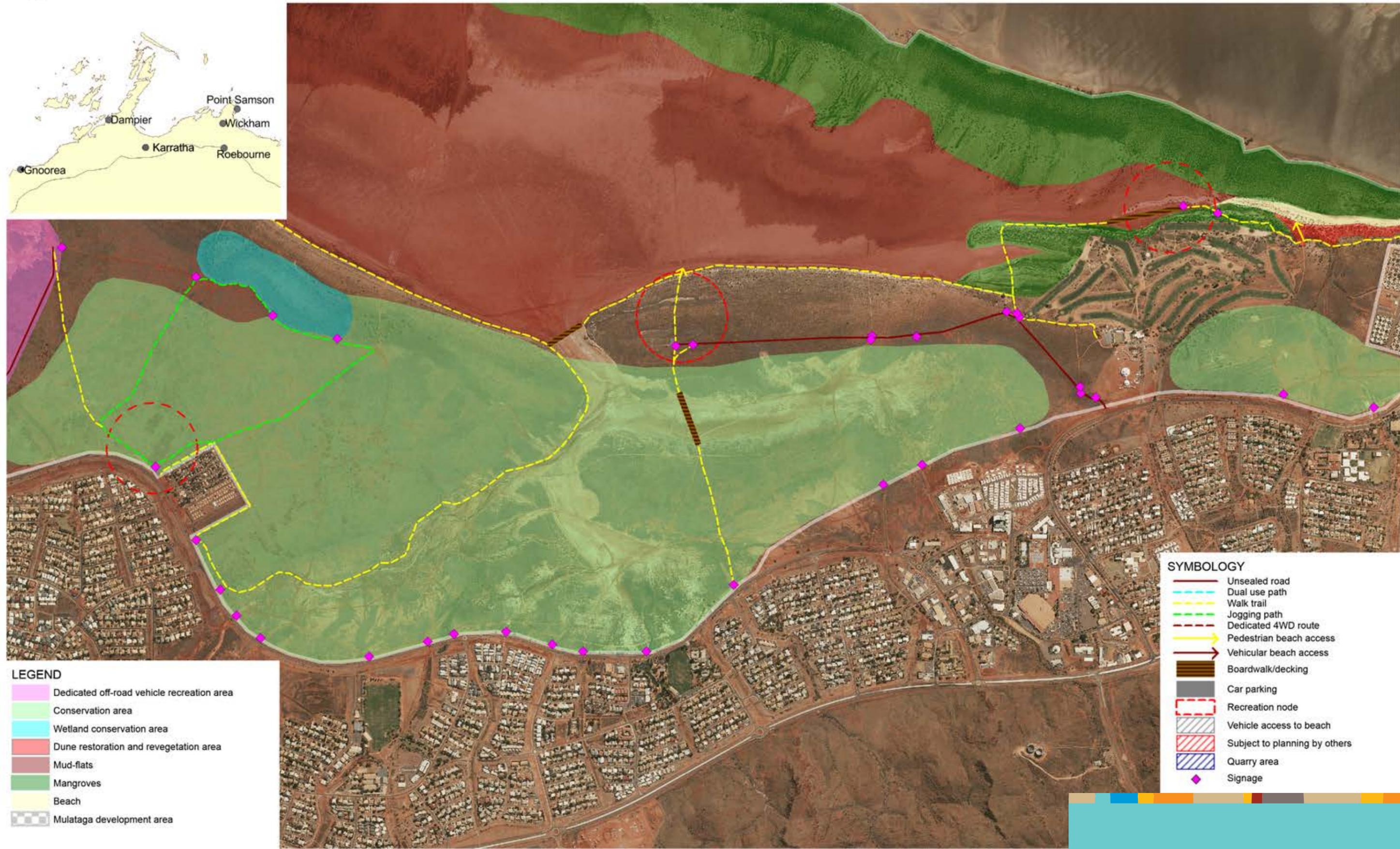
- SYMBOLOLOGY**
- Unsealed road
 - Dual use path
 - Walk trail
 - Jogging path
 - Dedicated 4WD route
 - Pedestrian beach access
 - Vehicular beach access
 - Boardwalk/decking
 - Car parking
 - Recreation node
 - Vehicle access to beach
 - Subject to planning by others
 - Quarry area
 - Signage

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Scale 1: 40,000
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Shire of Roebourne - Karratha foreshore management plan

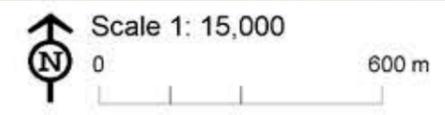
Figure 5 - Conservation area detail



- LEGEND**
- Dedicated off-road vehicle recreation area
 - Conservation area
 - Wetland conservation area
 - Dune restoration and revegetation area
 - Mud-flats
 - Mangroves
 - Beach
 - Mulataga development area

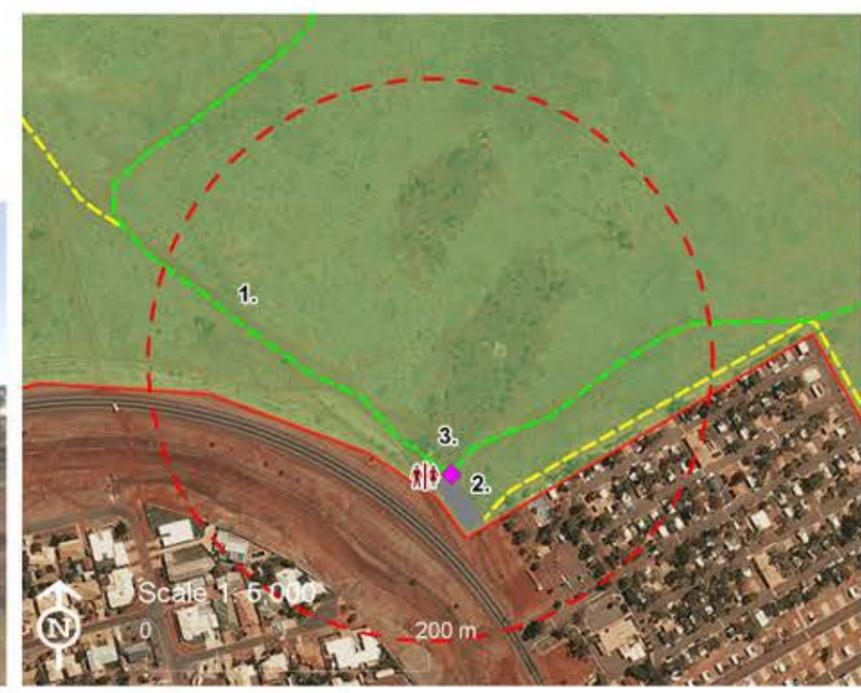
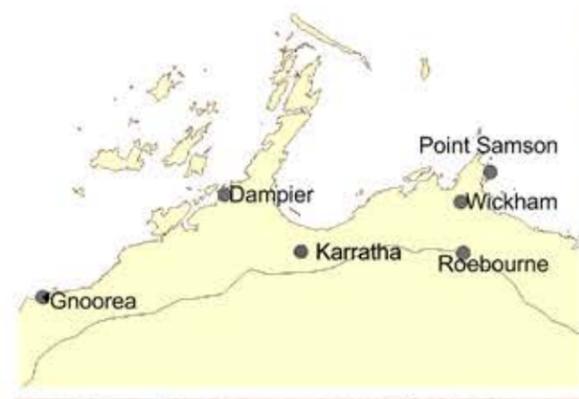
- SYMBOLY**
- Unsealed road
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 - Boardwalk/decking
 - Car parking
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 - Vehicle access to beach
 - Subject to planning by others
 - Quarry area
 - Signage

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Shire of Roebourne - Karratha foreshore management plan

Figure 6 - Node 1: Balmoral Road



- NOTES:**
1. Establish walking trails and jogging path through conservation area.
 2. Construct parking area and toilets
 3. Provide signage to indicate status as conservation area and 'at risk of inundation'.
 4. Close-off existing informal driving tracks
 5. Identify wetland conservation area (potential Priority Ecological Community).

- SYMBOLY**
- Unsealed road
 - Dual use path
 - Walk trail
 - Jogging path
 - Dedicated 4WD route
 - Pedestrian beach access
 - Vehicular beach access
 - Boardwalk/decking
 - Car parking
 - Recreation node
 - Vehicle access to beach
 - Subject to planning by others
 - Quarry area
 - Signage
 - Shelter
 - Rubbish bins
 - Fish cleaning facilities
 - Toilets

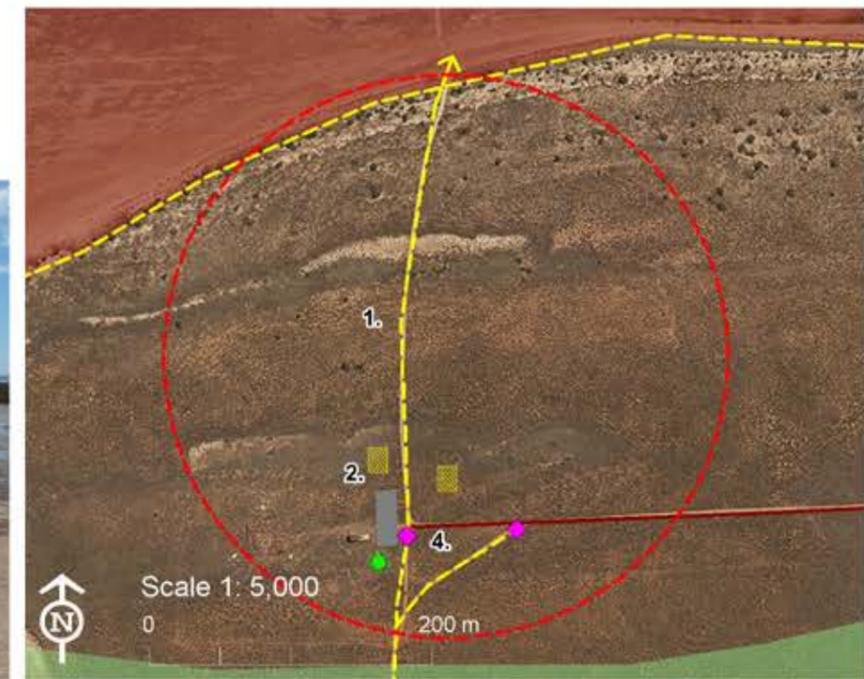
- LEGEND**
- Dedicated off-road vehicle recreation area
 - Conservation area
 - Wetland conservation area
 - Dune restoration and revegetation area
 - Mud-flats
 - Mangroves
 - Beach
 - Mulataga development area

Scale 1: 40,000 at A3
 0 1.6 km

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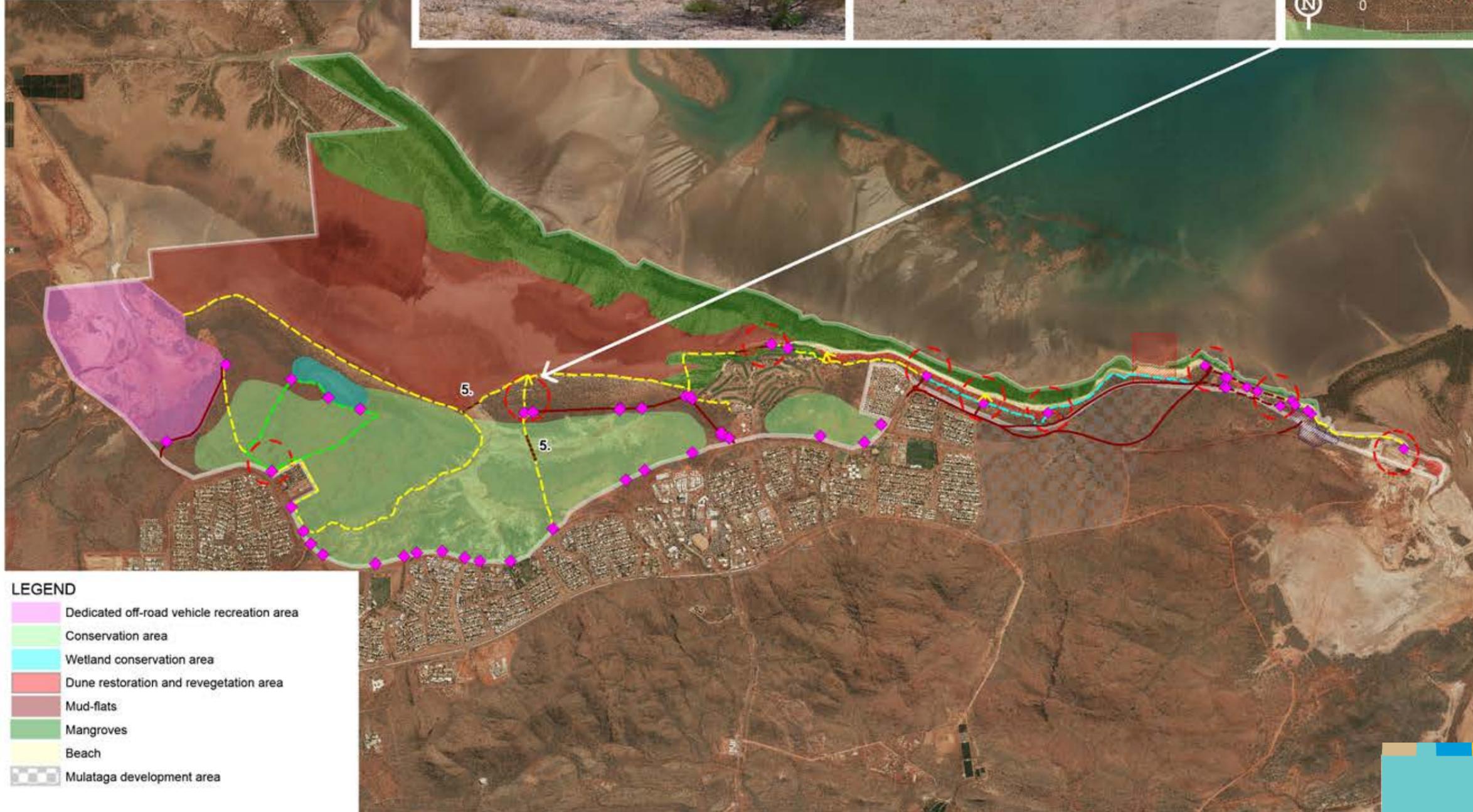
Shire of Roebourne - Karratha foreshore management plan

Figure 7 - Node 2: Pegs Creek



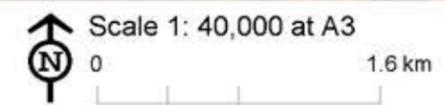
- NOTES:**
1. Establish walking trail from townsite to beach through conservation area.
 2. Construct parking area, shelters and bins
 3. Provide signage to indicate status of conservation area and area 'at risk of inundation'.
 4. Formalise vehicle access to car-park and close-off existing informal driving tracks through conservation area including advice 'no vehicular crossing of Pegs Creek'
 5. Construct boardwalks over inundated areas

- SYMBOLOLOGY**
- Unsealed road
 - Dual use path
 - Walk trail
 - jogging path
 - Dedicated 4WD route
 - Pedestrian beach access
 - Vehicular beach access
 - Boardwalk/decking
 - Car parking
 - Recreation node
 - Vehicle access to beach
 - Subject to planning by others
 - Quarry area
 - Signage
 - Shelter
 - Rubbish bins
 - Fish cleaning facilities
 - Toilets



- LEGEND**
- Dedicated off-road vehicle recreation area
 - Conservation area
 - Wetland conservation area
 - Dune restoration and revegetation area
 - Mud-flats
 - Mangroves
 - Beach
 - Mulataga development area

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Shire of Roebourne - Karratha foreshore management plan

Figure 8 - Node 3: Golf Course



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Shire of Roebourne - Karratha foreshore management plan

Figure 9 - Node 4: Searipple Road



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Shire of Roebourne - Karratha foreshore management plan

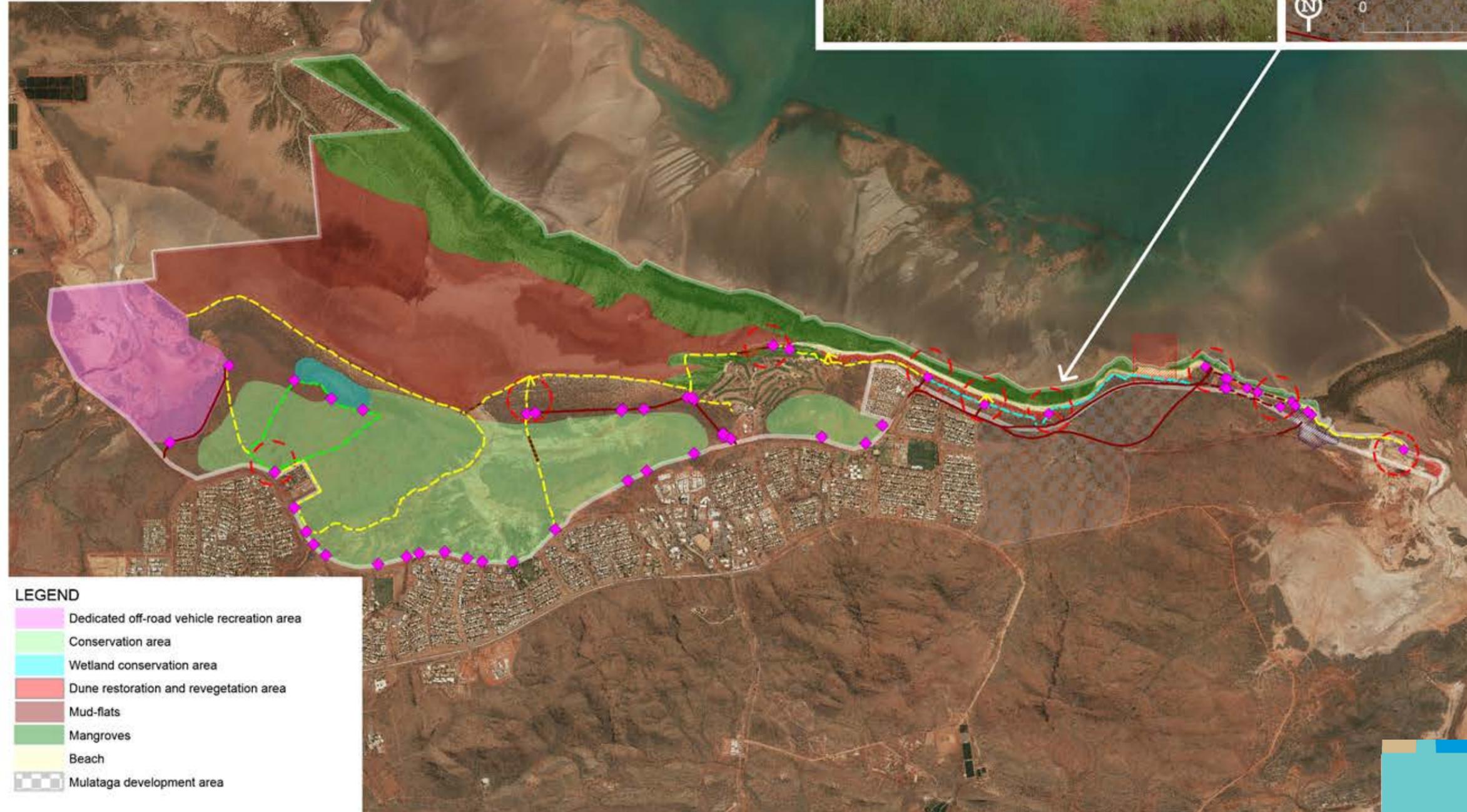
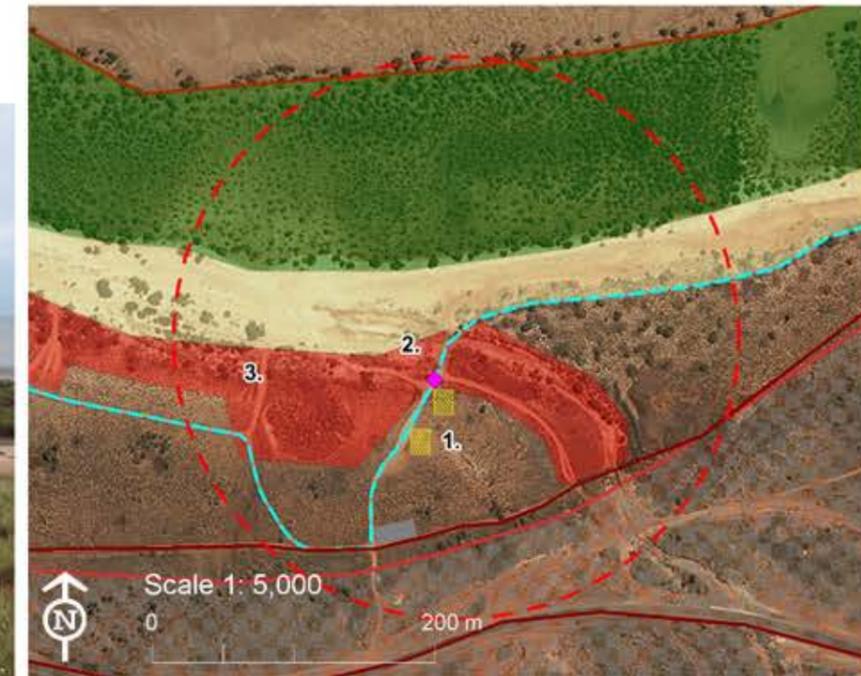
Figure 10 - Node 5: Maitland Road



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Shire of Roebourne - Karratha foreshore management plan

Figure 11 - Node 6: Mulataga Creek

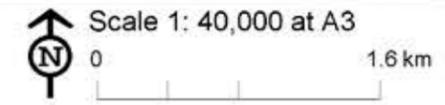


- NOTES:**
1. Construct shelters and dual use path.
 2. Provide signage to identify Aboriginal and environmental values of the area.
 3. Close alternate footpaths to beach and undertake dune revegetation and restoration.

- SYMBOLOLOGY**
- Unsealed road
 - Dual use path
 - Walk trail
 - Jogging path
 - Dedicated 4WD route
 - Pedestrian beach access
 - Vehicular beach access
 - Boardwalk/decking
 - Car parking
 - Recreation node
 - Vehicle access to beach
 - Subject to planning by others
 - Quarry area
 - Signage
 - Shelter
 - Rubbish bins
 - Fish cleaning facilities
 - Toilets

- LEGEND**
- Dedicated off-road vehicle recreation area
 - Conservation area
 - Wetland conservation area
 - Dune restoration and revegetation area
 - Mud-flats
 - Mangroves
 - Beach
 - Mulataga development area

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Figure 12 - Node 7: Karratha Back Beach



- NOTES:**
1. Establish dedicated 4WD route along beach and return behind dunes.
 2. Construct 2 additional shelters, fish cleaning facilities and dedicated bins.
 3. Provide signage to identify extent of 4WD access to beach.
 4. Formalise beach and off-beach parking areas.

- SYMBOLY**
- Unsealed road
 - Dual use path
 - Walk trail
 - Jogging path
 - Dedicated 4WD route
 - Pedestrian beach access
 - Vehicular beach access
 - Boardwalk/decking
 - Car parking
 - Recreation node
 - Vehicle access to beach
 - Subject to planning by others
 - Quarry area
 - Signage
 - Shelter
 - Rubbish bins
 - Fish cleaning facilities
 - Toilets

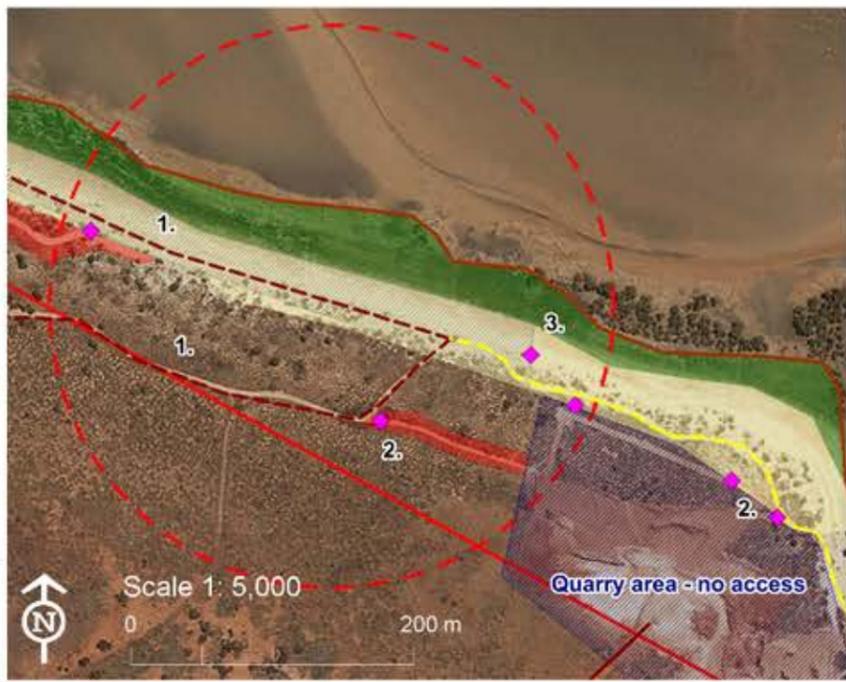
- LEGEND**
- Dedicated off-road vehicle recreation area
 - Conservation area
 - Wetland conservation area
 - Dune restoration and revegetation area
 - Mud-flats
 - Mangroves
 - Beach
 - Mulataga development area

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Scale 1: 40,000 at A3
0 1.6 km

Shire of Roebourne - Karratha foreshore management plan

Figure 13 - Node 8: Mystery Road

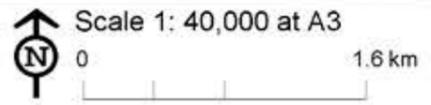


- NOTES:**
1. Establish dedicated 4WD route along beach and return through dunes.
 2. Provide signage to prevent public access to quarry area.
 3. Provide signage to identify extent of 4WD access to beach.

- SYMBOLY**
- Unsealed road
 - Dual use path
 - Walk trail
 - Jogging path
 - Dedicated 4WD route
 - Pedestrian beach access
 - Vehicular beach access
 - Boardwalk/decking
 - Car parking
 - Recreation node
 - Vehicle access to beach
 - Subject to planning by others
 - Quarry area
 - Signage
 - Shelter
 - Rubbish bins
 - Fish cleaning facilities
 - Toilets

- LEGEND**
- Dedicated off-road vehicle recreation area
 - Conservation area
 - Wetland conservation area
 - Dune restoration and revegetation area
 - Mud-flats
 - Mangroves
 - Beach
 - Mulataga development area

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Figure 14 - Node 9: Nickol River



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4. References

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Steffen W. 2011, *The Critical Decade: Western Australia climate change impacts*, Climate Commission, Australian Government, Canberra

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Appendix 1

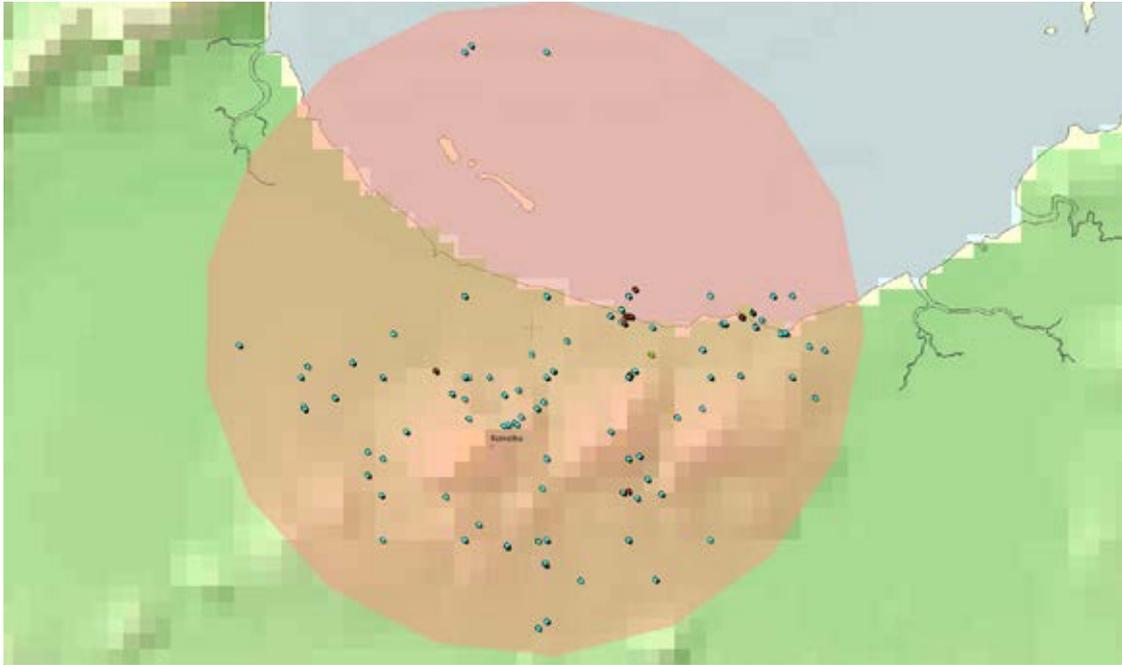
Flora and Fauna
Search Reports



40 Mile Beach - Nature Map

Printed by Guest user on 27/5/2013

Query details : Current Names Only=Yes; Core Datasets Only=Yes; Method='By Circle'; Centre=116°50' 49" E,20°43' 23" S; Buffer=



- Rare or likely to become extinct
- Protected under international agreement
- Priority 3
- Priority 4
- Non-conservation taxon
- Other
- Major WA Towns
- State Boundaries
- Australian Continent



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NatureMap Species Report

Created By Guest user on 27/05/2013

Current Names Only Yes
 Core Datasets Only Yes
 Method 'By Circle'
 Centre 116°50' 49" E,20°43' 23" S
 Buffer 7km
 Group By Conservation Status

Conservation Status	Species	Records
Rare or likely to become extinct	4	13
Protected under international agreement	16	87
Priority 3	1	1
Priority 4	2	3
Non-conservation taxon	370	864
TOTAL	393	968

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
2.	24790 <i>Calidris tenuirostris</i> (Great Knot)		T	
3.	24093 <i>Dasyurus hallucatus</i> (Northern Quoll)		T	
4.	24798 <i>Numenius madagascariensis</i> (Eastern Curlew)		T	
Protected under international agreement				
5.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
6.	41324 <i>Ardea modesta</i> (Eastern Great Egret)		IA	
7.	25736 <i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
8.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
9.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
10.	24789 <i>Calidris subminuta</i> (Long-toed Stint)		IA	
11.	25575 <i>Charadrius leschenaultii</i> (Greater Sand Plover)		IA	
12.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)		IA	
13.	30932 <i>Limosa lapponica</i> (Bar-tailed Godwit)		IA	
14.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)		IA	
15.	25742 <i>Numenius phaeopus</i> (Whimbrel)		IA	
16.	24497 <i>Oceanites oceanicus</i> (Wilson's Storm Petrel)		IA	
17.	24803 <i>Tringa brevipes</i> (Grey-tailed Tattler)		IA	
18.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
19.	24808 <i>Tringa nebularia</i> (Common Greenshank)		IA	
20.	24809 <i>Tringa stagnatilis</i> (Marsh Sandpiper)		IA	
Priority 3				
21.	12673 <i>Acacia glaucocaesia</i>		P3	
Priority 4				
22.	25196 <i>Notoscincus butleri</i> (Lined Soil-crevice Skink)		P4	
23.	24233 <i>Pseudomys chapmani</i> (Western Pebble-mound Mouse, Ngadjji)		P4	
Non-conservation taxon				
24.	4886 <i>Abutilon amplum</i>			
25.	4895 <i>Abutilon lepidum</i>			
26.	4899 <i>Abutilon malvifolium</i> (Bastard Marshmallow)			
27.	4902 <i>Abutilon oxycarpum</i> (Flannel Weed)			
28.	3209 <i>Acacia ampliceps</i>			
29.	3214 <i>Acacia ancistrocarpa</i> (Fitzroy Wattle)			
30.	3241 <i>Acacia bivenosa</i>			
31.	13500 <i>Acacia coriacea</i> subsp. <i>coriacea</i>			
32.	13502 <i>Acacia coriacea</i> subsp. <i>pendens</i>			
33.	3377 <i>Acacia inaequilatera</i> (Baderi)			
34.	3434 <i>Acacia maitlandii</i> (Maitland's Wattle)			
35.	29015 <i>Acacia pyrifolia</i> var. <i>pyrifolia</i>			
36.	13078 <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>			

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Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
37.	29135 <i>Acacia sericophylla</i>			
38.	3551 <i>Acacia sphaerostachya</i>			
39.	19456 <i>Acacia stellaticeps</i>			
40.	13070 <i>Acacia synchronicia</i>			
41.	3573 <i>Acacia tenuissima</i>			
42.	3579 <i>Acacia trachycarpa</i> (Minni Ritchi, Balgali)			
43.	3606 <i>Acacia xiphophylla</i>			
44.	25332 <i>Acanthopis wellsii</i> (Pilbara Death Adder)			
45.	2645 <i>Achyranthes aspera</i> (Chaff Flower)			
46.	2646 <i>Aerva javanica</i> (Kapok Bush)	Y		
47.	4739 <i>Alectryon oleifolius</i>			
48.	2652 <i>Alternanthera nodiflora</i> (Common Joyweed)			
49.	17147 <i>Alysicarpus muelleri</i>			
50.	5278 <i>Ammannia multiflora</i>			
51.	30833 <i>Amphibolurus longirostris</i>			
52.	-11968 <i>Aname mellosa</i>			
53.	24312 <i>Anas gracilis</i> (Grey Teal)			
54.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
55.	7832 <i>Angianthus milnei</i> (Cone-spike Angianthus)			
56.	25318 <i>Antaresia perthensis</i> (Pygmy Python)			
57.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
58.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
59.	25567 <i>Artamus leucorhynchus</i> (White-breasted Woodswallow)			
60.	6580 <i>Asclepias curassavica</i> (Redhead Cottonbush)	Y		
61.	229 <i>Astrebula pectinata</i> (Barley Mitchell Grass)			
62.	2450 <i>Atriplex amnicola</i> (Swamp Saltbush)			
63.	2451 <i>Atriplex bunburyana</i> (Silver Saltbush)			
64.	2453 <i>Atriplex codonocarpa</i> (Flat-topped Saltbush)			
65.	2476 <i>Atriplex semilunaris</i> (Annual Saltbush)			
66.	24318 <i>Aythya australis</i> (Hardhead)			
67.	2775 <i>Boerhavia schomburgkiana</i>			
68.	6608 <i>Bonamia pannosa</i>			
69.	37721 <i>Bonamia</i> sp. Dampier (A.A. Mitchell PRP 217)			
70.	241 <i>Brachyachne convergens</i> (Spider Grass)			
71.	25331 <i>Brachyurophis approximans</i>			
72.	2995 <i>Brassica napus</i>	Y		
73.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
74.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
75.	10972 <i>Cajanus marmoratus</i>			
76.	7905 <i>Calotis multicaulis</i> (Many-stemmed Burr-daisy)			
77.	3749 <i>Canavalia rosea</i> (Wild Jack Bean)			
78.	2981 <i>Capparis spinosa</i>			
79.	258 <i>Cenchrus ciliaris</i> (Buffel Grass)	Y		
80.	29721 <i>Cenchrus setiger</i> (Birdwood Grass)	Y		
81.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
82.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
83.	266 <i>Chloris barbata</i> (Purpletop Chloris)	Y		
84.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
85.	2988 <i>Cleome viscosa</i> (Tickweed, Tjinduwadhu)			
86.	6732 <i>Clerodendrum tomentosum</i>			
87.	13689 <i>Clerodendrum tomentosum</i> var. <i>lanceolatum</i>			
88.	2776 <i>Commicarpus australis</i> (Perennial Tar Vine)			
89.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
90.	4862 <i>Corchorus parviflorus</i>			
91.	13467 <i>Corchorus trilocularis</i>			
92.	4867 <i>Corchorus walcottii</i> (Woolly Corchorus)			
93.	24416 <i>Corvus bennetti</i> (Little Crow)			
94.	24419 <i>Corvus splendens</i> (House Crow)			
95.	17093 <i>Corymbia hamersleyana</i>			
96.	17092 <i>Corymbia opaca</i>			
97.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
98.	24672 <i>Coturnix ypsilophora</i> subsp. <i>cervina</i> (Brown Quail)			
99.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
100.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
101.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
102.	19378 <i>Crotalaria dissitiflora</i> subsp. <i>benthamiana</i>			
103.	20179 <i>Crotalaria medicaginea</i> var. <i>neglecta</i>			
104.	11231 <i>Crotalaria novae-hollandiae</i> subsp. <i>novae-hollandiae</i>			
105.	24865 <i>Ctenophorus caudicinctus</i> subsp. <i>caudicinctus</i> (Ring-tailed Dragon)			
106.	24876 <i>Ctenophorus isolepis</i> subsp. <i>isolepis</i> (Crested Dragon, Military Dragon)			

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Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
107.	24882 <i>Ctenophorus nuchalis</i> (Central Netted Dragon)			
108.	25036 <i>Ctenotus duricola</i>			
109.	25043 <i>Ctenotus grandis</i> subsp. <i>titan</i>			
110.	25060 <i>Ctenotus pantherinus</i> subsp. <i>acripes</i> (Leopard Ctenotus)			
111.	25064 <i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i> (Leopard Ctenotus)			
112.	25073 <i>Ctenotus saxatilis</i> (Rock Ctenotus)			
113.	25077 <i>Ctenotus serventyi</i>			
114.	33031 <i>Cucumis maderaspatanus</i>			
115.	17118 <i>Cullen leucanthum</i>			
116.	17119 <i>Cullen leucochaites</i>			
117.	17120 <i>Cullen pogonocarpum</i>			
118.	13733 <i>Cuscuta victoriana</i>			
119.	25090 <i>Cyclodomorphus melanops</i> subsp. <i>melanops</i> (Slender Blue-tongue)			
120.	25371 <i>Cyclorana australis</i> (Giant Frog)			
121.	814 <i>Cyperus squarrosus</i>			
122.	24091 <i>Dasykaluta rosamondae</i> (Little Red Kaluta)			
123.	6963 <i>Datura metel</i> (Downy Thornapple)	Y		
124.	25001 <i>Delma nasuta</i>			
125.	25002 <i>Delma pax</i>			
126.	25004 <i>Delma tincta</i>			
127.	25297 <i>Demansia rufescens</i> (Rufous Whipsnake)			
128.	3852 <i>Desmodium campylocaulon</i>			
129.	3853 <i>Desmodium filiforme</i>			
130.	3856 <i>Desmodium muelleri</i>			
131.	7166 <i>Dicliptera armata</i>			
132.	24926 <i>Diplodactylus conspicillatus</i> (Fat-tailed Gecko)			
133.	41404 <i>Diplodactylus galaxias</i> (Northern Pilbara Beak-faced Gecko)			
134.	4745 <i>Diplopeltis eriocarpa</i> (Hairy Pepperflower)			
135.	4759 <i>Dodonaea coriacea</i>			
136.	7115 <i>Dolichandrone heterophylla</i> (Lemonwood)			
137.	2504 <i>Dysphania plantaginella</i>			
138.	2506 <i>Dysphania rhadinostachya</i>			
139.	24631 <i>Emblema pictum</i> (Painted Finch)			
140.	2511 <i>Enchylaena tomentosa</i> (Barrier Saltbush)			
141.	12064 <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> (Barrier Saltbush)			
142.	25362 <i>Ephalophis greyae</i>			
143.	380 <i>Eragrostis eriopoda</i> (Woollybutt Grass, Wangurnu)			
144.	381 <i>Eragrostis falcata</i> (Sickle Lovegrass)			
145.	7234 <i>Eremophila longifolia</i> (Berrigan, Tulypurpa)			
146.	16363 <i>Eremophila maculata</i> subsp. <i>brevifolia</i> (Native Fuchsia)			
147.	400 <i>Eriachne aristidea</i>			
148.	403 <i>Eriachne benthamii</i> (Swamp Wanderrie)			
149.	413 <i>Eriachne mucronata</i> (Mountain Wanderrie Grass)			
150.	414 <i>Eriachne obtusa</i> (Northern Wandarrie Grass)			
151.	24379 <i>Erythrogonyx cinctus</i> (Red-kneed Dotterel)			
152.	4614 <i>Euphorbia alsiniflora</i> (Namana)			
153.	4617 <i>Euphorbia australis</i> (Namana)			
154.	9048 <i>Euphorbia careyi</i>			
155.	4635 <i>Euphorbia myrtoides</i>			
156.	12097 <i>Euphorbia tannensis</i> subsp. <i>eremophila</i> (Desert Spurge)			
157.	11200 <i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>			
158.	25621 <i>Falco berigora</i> (Brown Falcon)			
159.	24471 <i>Falco berigora</i> subsp. <i>berigora</i> (Brown Falcon)			
160.	25622 <i>Falco cenchroides</i> (Australian Kestrel)			
161.	25623 <i>Falco longipennis</i> (Australian Hobby)			
162.	1753 <i>Ficus platypoda</i> (Native Fig, Makartu)			
163.	35558 <i>Flaveria trinervia</i> (Speedy Weed)	Y		
164.	25327 <i>Fordonia leucobalia</i> (White-bellied Mangrove Snake)			
165.	5188 <i>Frankenia ambita</i>			
166.	5209 <i>Frankenia pauciflora</i> (Seaheath)			
167.	25301 <i>Furina ornata</i> (Moon Snake)			
168.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
169.	24958 <i>Gehyra punctata</i>			
170.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
171.	24402 <i>Geopelia humeralis</i> (Bar-shouldered Dove)			
172.	25585 <i>Geopelia striata</i> (Zebra Dove)			
173.	24404 <i>Geophaps plumifera</i> (Spinifex Pigeon)			
174.	3938 <i>Glycine canescens</i> (Silky Glycine)			
175.	2674 <i>Gomphrena affinis</i>			
176.	11131 <i>Gomphrena sordida</i>			

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Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
177.	7521 <i>Goodenia lamprosperma</i>			
178.	7526 <i>Goodenia microptera</i>			
179.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
180.	13440 <i>Grevillea wickhamii</i> subsp. <i>aprica</i>			
181.	24484 <i>Grus rubicunda</i> (Brolga)			
182.	25627 <i>Haematopus fuliginosus</i> (Sooty Oystercatcher)			
183.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
184.	25541 <i>Haliastur indus</i> (Brahminy Kite)			
185.	24294 <i>Haliastur indus</i> subsp. <i>girrenera</i> (Brahminy Kite)			
186.	17301 <i>Heliotropium chrysocarpum</i>			
187.	17307 <i>Heliotropium inexplicitum</i>			
188.	6718 <i>Heliotropium tenuifolium</i> (Mamukata)			
189.	2688 <i>Hemichroa diandra</i>			
190.	25232 <i>Hemidactylus frenatus</i> (Asian House Gecko)	Y		
191.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			
192.	29317 <i>Hibiscus austrinus</i> var. <i>austrinus</i>			
193.	4942 <i>Hibiscus sturtii</i> (Sturt's Hibiscus)			
194.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
195.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
196.	25363 <i>Hydrelaps darwiniensis</i>			
197.	3973 <i>Indigofera colutea</i> (Sticky Indigo)			
198.	3980 <i>Indigofera linifolia</i>			
199.	3981 <i>Indigofera linnaei</i> (Birdsville Indigo)			
200.	3982 <i>Indigofera monophylla</i>			
201.	3987 <i>Indigofera trita</i>			
202.	6633 <i>Ipomoea muelleri</i> (Poison Morning Glory, Yumbu)			
203.	6635 <i>Ipomoea pes-caprae</i>			
204.	6637 <i>Ipomoea polymorpha</i>			
205.	-12507 <i>Isopedella gibсандi</i>			
206.	8088 <i>Ixochlamys cuneifolia</i>			
207.	12059 <i>Jasminum didymum</i> subsp. <i>lineare</i> (Desert Jasmine)			
208.	8095 <i>Lactuca saligna</i> (Wild Lettuce)	Y		
209.	-12311 <i>Latrodectus geometricus</i>			
210.	4960 <i>Lawrenzia viridigrisea</i>			
211.	3038 <i>Lepidium pholidogynum</i>			
212.	25125 <i>Lerista bipes</i>			
213.	30928 <i>Lerista clara</i>			
214.	25155 <i>Lerista muelleri</i>			
215.	30925 <i>Lerista verhmens</i>			
216.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
217.	4060 <i>Lotus australis</i> (Austral Trefoil)			
218.	4061 <i>Lotus cruentus</i> (Redflower Lotus)			
219.	30933 <i>Lucasium stenodactylum</i>			
220.	24135 <i>Macropus robustus</i> subsp. <i>erubescens</i> (Euro, Biggada)			
221.	2544 <i>Maireana georgei</i> (Satiny Bluebush)			
222.	11662 <i>Maireana tomentosa</i> subsp. <i>tomentosa</i>			
223.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
224.	25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren)			
225.	4962 <i>Malvastrum americanum</i> (Spiked Malvastrum)	Y		
226.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
227.	5051 <i>Melania oblongifolia</i>			
228.	25184 <i>Menetia greyii</i>			
229.	25187 <i>Menetia surda</i> subsp. <i>surda</i>			
230.	25542 <i>Milvus migrans</i> (Black Kite)			
231.	7082 <i>Mimulus gracilis</i>			
232.	8109 <i>Minuria integerrima</i> (Smooth Minuria)			
233.	8110 <i>Minuria leptophylla</i> (Minnie Daisy)			
234.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
235.	25193 <i>Morethia ruficauda</i> subsp. <i>exquisita</i>			
236.	17158 <i>Myoporum montanum</i> (Native Myrtle)			
237.	2573 <i>Neobassia astrocarpa</i>			
238.	3614 <i>Neptunia dimorphantha</i> (Sensitive Plant)			
239.	6971 <i>Nicotiana benthamiana</i> (Tjuntiwani)			
240.	11331 <i>Nicotiana occidentalis</i> subsp. <i>obliqua</i>			
241.	11856 <i>Nicotiana occidentalis</i> subsp. <i>occidentalis</i>			
242.	24095 <i>Ningau timealeyi</i> (Pilbara Ningau)			
243.	38421 <i>Notoleptopus decaisnei</i>			
244.	24224 <i>Notomys alexis</i> (Spinifex Hopping-mouse)			
245.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
246.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			

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247.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
248.	7338 <i>Oldenlandia crouchiana</i>			
249.	-12409 <i>Orthomorpha coarctata</i>			
250.	-12246 <i>Oxyopes variabilis</i>			
251.	25678 <i>Pachycephala melanura</i> (Mangrove Golden Whistler)			
252.	503 <i>Panicum decompositum</i> (Native Millet, Kaltu-kaltu)			
253.	25687 <i>Passer domesticus</i> (House Sparrow)	Y		
254.	-12608 <i>Pediana horni</i>			
255.	-11996 <i>Pediana tenuis</i>			
256.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
257.	24144 <i>Petrogale rothschildi</i> (Rothschild's Rock-wallaby)			
258.	4680 <i>Phyllanthus maderaspatensis</i>			
259.	-12603 <i>Ptilbarascutigera incola</i>			
260.	5230 <i>Pimelea ammodarctis</i>			
261.	8168 <i>Pluchea rubelliflora</i>			
262.	24679 <i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			
263.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
264.	2901 <i>Polycarpaea holtzei</i>			
265.	41365 <i>Polygala glaucifolia</i>			
266.	6655 <i>Polymeria calycina</i>			
267.	17513 <i>Polymeria lanata</i>			
268.	2878 <i>Portulaca conspicua</i>			
269.	24234 <i>Pseudomys delicatulus</i> (Delicate Mouse)			
270.	24237 <i>Pseudomys hermannsburgensis</i> (Sandy Inland Mouse)			
271.	42416 <i>Pseudonaja mengdeni</i> (Western Brown Snake)			
272.	25263 <i>Pseudonaja modesta</i> (Ringed Brown Snake)			
273.	8192 <i>Pterocaulon sphacelatum</i> (Apple Bush)			
274.	8193 <i>Pterocaulon sphaeranthoides</i>			
275.	2690 <i>Ptilotus aevoides</i>			
276.	2696 <i>Ptilotus astrolasius</i>			
277.	2698 <i>Ptilotus auriculifolius</i>			
278.	2699 <i>Ptilotus axillaris</i> (Mat Mulla Mulla)			
279.	2704 <i>Ptilotus calostachyus</i> (Weeping Mulla Mulla)			
280.	2711 <i>Ptilotus clementii</i> (Tassel Top)			
281.	2717 <i>Ptilotus divaricatus</i> (Climbing Mulla Mulla)			
282.	2725 <i>Ptilotus fusiformis</i>			
283.	2728 <i>Ptilotus gomphrenoides</i>			
284.	2731 <i>Ptilotus helipteroides</i> (Hairy Mulla Mulla)			
285.	2741 <i>Ptilotus macrocephalus</i> (Featherheads)			
286.	2745 <i>Ptilotus murrayi</i>			
287.	2746 <i>Ptilotus nobilis</i> (Tall Mulla Mulla)			
288.	41001 <i>Ptilotus nobilis</i> subsp. <i>nobilis</i> (Yellow Tails)			
289.	2747 <i>Ptilotus obovatus</i> (Cotton Bush)			
290.	25270 <i>Ramphotyphlops ammodytes</i>			
291.	25312 <i>Ramphotyphlops braminus</i>	Y		
292.	25277 <i>Ramphotyphlops grypus</i>			
293.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
294.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
295.	24457 <i>Rhipidura phasiana</i> (Mangrove Grey Fantail)			
296.	5295 <i>Rhizophora stylosa</i> (Spotted-leaved Red Mangrove)			
297.	4190 <i>Rhynchosia australis</i> (Rhynchosia)			
298.	4191 <i>Rhynchosia minima</i> (Rhynchosia)			
299.	30434 <i>Salsola australis</i>			
300.	2357 <i>Santalum lanceolatum</i> (Northern Sandalwood, Yarngull)			
301.	13006 <i>Sarcostemma viminale</i> subsp. <i>australe</i>			
302.	7608 <i>Scaevola cunninghamii</i>			
303.	7644 <i>Scaevola spinescens</i> (Currant Bush, Maroon)			
304.	41660 <i>Schenkia australis</i>			
305.	8877 <i>Sclerolaena gardneri</i>			
306.	2633 <i>Sclerolaena uniflora</i> (Two-spined Saltbush)			
307.	12280 <i>Senna artemisioides</i> subsp. <i>oligophylla</i>			
308.	18443 <i>Senna ferraria</i>			
309.	18346 <i>Senna glutinosa</i>			
310.	12305 <i>Senna glutinosa</i> subsp. <i>chatelainiana</i>			
311.	12308 <i>Senna glutinosa</i> subsp. <i>x luerssenii</i>			
312.	18451 <i>Senna hamersleyensis</i>			
313.	12312 <i>Senna notabilis</i>			
314.	4196 <i>Sesbania cannabina</i> (Sesbania Pea)			
315.	4976 <i>Sida echinocarpa</i>			
316.	33698 <i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)			

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Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
317.	-12655 <i>Simaetha tenuior</i>			
318.	24116 <i>Sminthopsis macroura</i> (Stripe-faced Dunnart)			
319.	6998 <i>Solanum cleistogamum</i>			
320.	7002 <i>Solanum diversiflorum</i>			
321.	7007 <i>Solanum esuriale</i> (Quena)			
322.	7009 <i>Solanum gabrielae</i>			
323.	7018 <i>Solanum lasiophyllum</i> (Flannel Bush, Mindjulu)			
324.	4734 <i>Stackhousia muricata</i>			
325.	7099 <i>Stemodia kingii</i>			
326.	8234 <i>Streptoglossa adscendens</i>			
327.	8235 <i>Streptoglossa bubakii</i>			
328.	8237 <i>Streptoglossa decurrens</i>			
329.	8238 <i>Streptoglossa liatroides</i>			
330.	8240 <i>Streptoglossa odora</i>			
331.	24924 <i>Strophurus ciliaris</i> subsp. <i>aberrans</i>			
332.	24927 <i>Strophurus elderi</i>			
333.	24932 <i>Strophurus jeanae</i>			
334.	12353 <i>Stylosanthes hamata</i> (Verano Stylo)	Y		
335.	2638 <i>Suaeda arbusculoides</i>			
336.	25307 <i>Suta punctata</i> (Spotted Snake)			
337.	4231 <i>Swainsona kingii</i>			
338.	4242 <i>Swainsona pterostylis</i>			
339.	7363 <i>Synaptantha tillaeacea</i>			
340.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
341.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
342.	31616 <i>Tecticornia auriculata</i>			
343.	33236 <i>Tecticornia halocnemoides</i> (Shrubby Samphire)			
344.	33240 <i>Tecticornia halocnemoides</i> subsp. <i>longispicata</i>			
345.	33319 <i>Tecticornia indica</i> subsp. <i>bidens</i>			
346.	33356 <i>Tecticornia indica</i> subsp. <i>indica</i>			
347.	33318 <i>Tecticornia indica</i> subsp. <i>leiostachya</i> (Samphire)			
348.	33299 <i>Tecticornia pergranulata</i> subsp. <i>elongata</i>			
349.	31618 <i>Tecticornia pruinosa</i>			
350.	4263 <i>Tephrosia clementii</i>			
351.	19531 <i>Tephrosia rosea</i> var. <i>clementii</i>			
352.	17768 <i>Tephrosia</i> sp. Bungaroo Creek (M.E. Trudgen 11601)			
353.	15949 <i>Tephrosia</i> sp. D Kimberley Flora (R.D. Royce 1848)			
354.	42442 <i>Tephrosia</i> sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)			
355.	40060 <i>Tephrosia</i> sp. clay soils (S. van Leeuwen et al. PBS 0273)			
356.	5300 <i>Terminalia canescens</i> (Joolal)			
357.	5310 <i>Terminalia platyphylla</i> (Wild Plum, Durin)			
358.	2644 <i>Threlkeldia diffusa</i> (Coast Bonefruit)			
359.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
360.	25548 <i>Todiramphus chloris</i> (Collared Kingfisher)			
361.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			
362.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
363.	24309 <i>Todiramphus sanctus</i> subsp. <i>sanctus</i> (Sacred Kingfisher)			
364.	6278 <i>Trachymene oleracea</i>			
365.	2832 <i>Trianthema triquetra</i> (Red Spinach)			
366.	2833 <i>Trianthema turgidifolia</i>			
367.	4377 <i>Tribulus hirsutus</i>			
368.	4379 <i>Tribulus macrocarpus</i>			
369.	4380 <i>Tribulus occidentalis</i> (Perennial Caltrop)			
370.	4381 <i>Tribulus platypterus</i> (Cork Hopbush)			
371.	6727 <i>Trichodesma zeylanicum</i> (Camel Bush, Kumbalin)			
372.	11750 <i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>			
373.	7381 <i>Trichosanthes cucumerina</i>			
374.	679 <i>Triodia angusta</i>			
375.	13131 <i>Triodia epactia</i>			
376.	704 <i>Triodia wiseana</i> (Limestone Spinifex)			
377.	4873 <i>Triumfetta appendiculata</i>			
378.	14694 <i>Triumfetta clementii</i>			
379.	30814 <i>Tympanocryptis cephalus</i> (Pebble Dragon)			
380.	30716 <i>Vachellia farnesiana</i> (Mimosa Bush)	Y		
381.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
382.	25209 <i>Varanus acanthurus</i> (Spiny-tailed Monitor)			
383.	25210 <i>Varanus brevicauda</i> (Short-tailed Pygmy Monitor)			
384.	4323 <i>Vigna lanceolata</i> (Maloga Vigna, Wega)			
385.	31391 <i>Vigna</i> sp. Hamersley Clay (A.A. Mitchell PRP 113)			
386.	5106 <i>Waltheria indica</i>			

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385.	31391 <i>Vigna</i> sp. Hamersley Clay (A.A. Mitchell PRP 113)			
386.	5106 <i>Waltheria indica</i>			

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Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
387.	-13011 <i>Wesmaldra nixaut</i>			
388.	728 <i>Whiteochloa cymbiformis</i>			
389.	729 <i>Xerochloa barbata (Rice Grass)</i>			
390.	12679 <i>Zornia muelleriana subsp. congesta</i>			
391.	24857 <i>Zosterops luteus (Yellow White-eye)</i>			
392.	4395 <i>Zygophyllum retivalve</i>			
393.	24248 <i>Zyzomys argurus (Common Rock-rat)</i>			

Conservation Codes

- T - Rare or likely to become extinct
- X - Presumed extinct
- IA - Protected under international agreement
- S - Other specially protected fauna
- 1 - Priority 1
- 2 - Priority 2
- 3 - Priority 3
- 4 - Priority 4
- 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



Australian Government

Department of Sustainability, Environment,
Water, Population and Communities

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: 27/05/13 14:14:53

[Summary](#)

[Details](#)

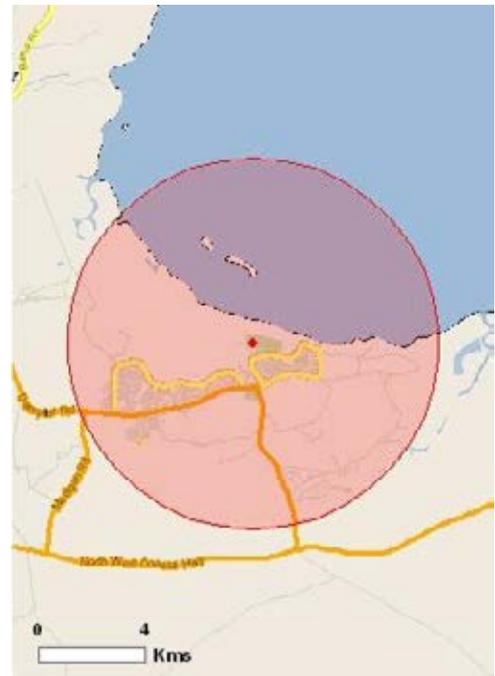
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



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[Coordinates](#)

[Buffer: 7.0Km](#)



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](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	16
Listed Migratory Species:	23

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 and the heritage values of a place on the Register of the National Estate.

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.

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.

Commonwealth Land:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	60
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

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

Place on the RNE:	2
State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	15
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Dasyurus hallucatus Northern Quoll [331]	Endangered	Species or species habitat likely to occur within area
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Notoryctes caurinus Karkarratul, Northern Marsupial Mole [295]	Endangered	Species or species habitat likely to occur within area
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known

Name	Status	Type of Presence
Chelonia mydas Green Turtle [1765]	Vulnerable	to occur within area Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Liasis olivaceus barroni Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area

Sharks

Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species

[Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area

Migratory Marine Species

Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur

Name	Threatened	Type of Presence
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat may occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name

Commonwealth Land -
Defence - KARRATHA TRAINING DEPOT

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
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur

Name	Threatened	Type of Presence
Ardea alba Great Egret, White Egret [59541]		within area Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Fish		
Bulbonaricus brauni Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
Campichthys tricarinatus Three-keel Pipefish [66192]		Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area

Name	Threatened	Type of Presence area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Haliichthys taeniophorus Ribbened Pipehorse, Ribbened Seadragon [66226]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Mammals		
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Reptiles		
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Aipysurus duboisii Dubois' Seasnake [1116]		Species or species habitat may occur within area
Aipysurus eydouxii Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Aipysurus tenuis Brown-lined Seasnake [1121]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
Ephalophis greyi North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Hydrelaps darwiniensis Black-ringed Seasnake [1100]		Species or species habitat may occur within area
Hydrophis czeblukovi		

Name	Threatened	Type of Presence
Hydrophis mcdowelli null [25926]		habitat may occur within area Species or species habitat may occur within area
Hydrophis ornatus a seasnake [1111]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat may occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

Places on the RNE [[Resource Information](#)]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Coastal Margin Cape Preston to Cape Keraudren	WA	Indicative Place
Dampier Archipelago Marine Areas	WA	Indicative Place

State and Territory Reserves [[Resource Information](#)]

Name	State
Unnamed WA38287	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
Birds		
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
Mammals		
Equus caballus		
Horse [5]		Species or species habitat likely to occur within area
Felis catus		

Name	Status	Type of Presence
Horse Bean [12301]		habitat likely to occur within area
Prosopis spp.		
Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus		
Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus		
Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat likely to occur within area

Coordinates

-20.72306 116.84694

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 Heritage and Register of National Estate properties, Wetlands of International 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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Department of Environment, Climate Change and Water, New South Wales](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment and Natural Resources, South Australia](#)
- [Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [Environmental and Resource Management, Queensland](#)
- [Department of Environment and Conservation, Western Australia](#)
- [Department of the Environment, Climate Change, Energy and Water](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [SA Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [State Forests of NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- 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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