



hearson cove - foreshore management plan

november 2016



Cover image. Hearson Cove beach and rocky headland (UDLA)

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Note: This report should be printed at A3 / Double sided / Short edge / Open to left

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From the community

Hearson Cove is a special place for locals across the City of Karratha. It's a place for having a BBQ or a picnic, for swimming, nature appreciation, relaxing, walking the dog, fishing, searching for cockle shells, spending time with family, and taking a dip. At low tide, the tidal flats can be explored for hundreds of metres. At high tide, Hearson Cove is one of the best swimming beaches in the area.

Situated on the east coast of the Burrup Peninsula and part of the Dampier Archipelago, or Murujuga, Hearson Cove is a community place, embedded with strong cultural and environmental values, with tourism numbers that are set to grow in the coming years.

The drive to the foreshore from the turn off to Hearson Cove Road tells a story of the broader cultural and unique Murujuga landscape, across the low, coastal flats which run between piles of red rock outcrops that characterise the peninsula.

To the south is Deep Gorge, a highly sacred and culturally significant site for the traditional custodians of Murujuga, as is the entirety of the archipelago. Also to the south is the future site for the Murujuga Living Knowledge Centre, which will be the tourism, interpretation and operational centre for the Murujuga National Park Land and Sea Unit. To the north, rising out of the tidal flats, are industrial plants that have characterised much of the North West since the resources boom of the 1960s.

Arrival at the coast offers an outlook across the broader Nickol Bay. The shell beach is nestled between two rocky headlands. Low spinifex covered dunes provide the perfect Pilbara backdrop, with saline tidal flats beyond. This foreshore provides a unique snapshot of the landscape that characterises the Dampier Archipelago, Murujuga, and its unique and diverse landscape.

As the popularity of Hearson Cove grows, both as an access point to Murujuga National Park and for events such as 'Staircase to the Moon' and Ballet on the Beach which are only increasing in popularity, the Hearson Cove Foreshore Management Plan aims to respect the existing uses and character of the place, whilst making sure that this area can continue to be used well in to the future. It's important that Hearson Cove remains a place where the locals can appreciate what the Pilbara has to offer.

This foreshore area is one where many values intersect and overlap. The Hearson Cove Foreshore Reserve, vested in the City of Karratha, is surrounded by Murujuga National Park, owned by and cared for by the area's Traditional Custodians. Beyond the National Park, in the Burrup Peninsula's accessible tidal flats, is the peninsula's Strategic Industrial Area, with many major industrial interests and developments. Adding to these complex layers of land use are diverse and living European and Aboriginal histories, a strong and growing tourism industry, a unique geomorphology, world class and ancient archaeology and rock art, and a much valued and loved community amenity in the foreshore area itself.

It is these overlapping values that have been addressed in this Foreshore Management Plan through a collaborative engagement process. The plan puts forward a series of key recommendations that build upon the existing strong community spirit and diverse interests that belong to Hearson Cove.

The recommendations were developed on a foundation of six (6) key themes, distilled from background and context analysis and community and stakeholder analysis. These key themes are as follows.

1. AMENITY // Upgrades to the existing, low-key amenity;
2. ACCESS // Continued controlled access to the beach, with respect to current condition and rising tourist numbers;
3. PROTECTION // Protection of vulnerable cultural and ecological areas;
4. GOVERNANCE // Shared governance which involves and reflects the values of community and stakeholders;
5. EDUCATION // Education and awareness about social, environmental and cultural values, and associated uses; and,
6. RISK MANAGEMENT // Risk management with respect to large events and adjacent industry.

From these themes, the shared direction for the Hearson Cove Beach Area Foreshore was developed.



Image. Mangroves at Hearson Cove (Ken Mulvaney)

2.1 purpose and objectives

The purpose of the Hearson Cove Foreshore Management Plan (FMP) is to provide a framework that guides the ongoing use and management of this significant foreshore area.

The Hearson Cove FMP aims to uphold a sustainable approach to place planning with regard to developing:

- Social capital;
- Environmental leadership;
- Economic diversity; and,
- Robust governance.

The Hearson Cove FMP aims to:

- Uphold and contribute to the implementation of local and regional planning objectives and coastal strategies;
- Facilitate community engagement and build community capacity and ownership of the area through shared responsibility between the City of Karratha, key stakeholders and local community; and,
- Foster the sustainable recreational use and management of the area through a plan that:
 - Enhances amenity;
 - Recognises and incorporates the environmental and social values of the area;
 - Manages access arrangements; and,
 - Allows for long term infrastructure / amenity provision.

2.2 subject area

The principal study area is the foreshore included within Reserve 47014, vested with the City of Karratha, and as shown in Figure 1.

In order to adequately address the issues impacting upon the site, recommendations and background analysis has extended beyond the boundaries of the subject area, where required and in recognition that this landscape is part of a larger system.

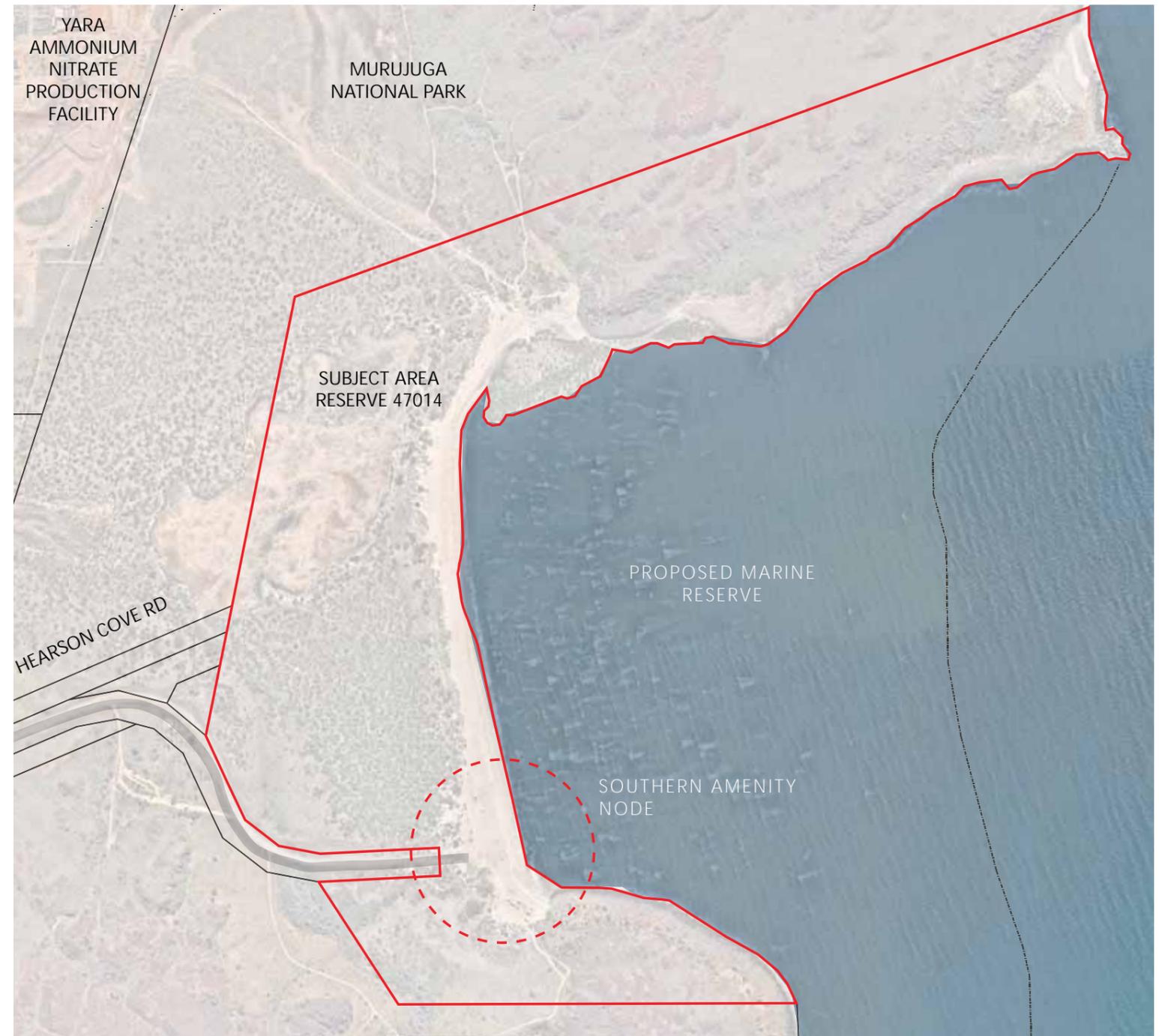


Figure 1. Subject area - Scale: 1:7,500 at A3

2.3 engagement methodology

2.3.1 aim

The aim of the community engagement for the Hearson Cove FMP was to collaborate and develop the management plan with the City of Karratha community and stakeholders. To achieve this, the following objectives were undertaken:

- Involve the City of Karratha community and stakeholders in decision making and setting a shared direction for their foreshore;
- Actively listen to any issues or feedback the City of Karratha community and stakeholders may have about the Hearson Cove FMP;
- Provide a quick and effective response to any queries, which arise throughout the process and to incorporate and address issues which may arise in a timely and respectful manner;
- Create a collective team of community members, stakeholders and the City of Karratha who can work toward a shared responsibility for the Hearson Cove Foreshore; and,
- Collectively guide the developing social capacity of City of Karratha community and stakeholders.

2.3.2 approach

It is recognised that the Hearson Cove has significant value for the City of Karratha, as a prime tourist destination, cultural site and local recreational location.

Therefore, to ensure that the FMP appropriately reflects the high value that is associated with the site, a number of tools have been used to engage people in a collaborative design process, including the following:

- Online survey;
- Community workshops;
- 'One-on-one' meetings with key stakeholders; and,
- Hearson Cove Stakeholder Reference Group.

The following is a list of the key stakeholders / community representatives that who were involved in the design process:

- City of Karratha;
- Department of Transport (DoT);
- Yaburara and Coastal Mardudhunera Aboriginal Corporation (YacMac);
- Murujuga Aboriginal Corporation (MAC);
- Hearson Cove Stakeholder Reference Group (Woodside, Yara, Landcorp, Pilbara Ports Authority, City of Karratha, Dampier Community Association, Karratha Community Association; and,
- City of Karratha community representatives.

As shown in Figure 2, the collaborative design process included five key phases:

- Phase 1 | Background Review and Context Analysis;
- Phase 2 | Stakeholder Engagement;
- Phase 3 | Draft FMP;
- Phase 4 | Stakeholder Engagement; and,
- Phase 5 | Final FMP.

Online survey and updates

To ensure the wider community had the opportunity to provide input into the management plan, an online survey was incorporated into the City of Karratha's website, at <http://www.karratha.wa.gov.au/foreshore-management-plans>. The purpose of this was to:

- Inform the wider community and stakeholders about the Hearson Cove FMP and associated project objectives;
- Understand the range of users who visit the foreshore, how often and the types of activities that are associated with the foreshore;
- Understand the values, themes and key issues that are associated with the foreshore; and,
- Provide opportunity for interested participants to be involved in Community and Stakeholder Workshops, and provide two way input.

Community workshops

As part of the collaborative design process, UDLA facilitated two Community / Stakeholder Workshops.

These workshops provided an opportunity for two-way education and shared understanding in the proposed planning and management objectives that eventuated into an agreed direction.

The two workshops included discussion on:

- Opportunities and Directions (Workshop 1) - 18th November 2015; and,
- Draft FMP (Workshop 2) - 17th February 2015.

One-on-one meetings with key stakeholders

Individual meetings were undertaken through a design facilitation process (active listening), input and shared understanding in spatial planning design development. Individual meetings with smaller groups provided an opportunity to meet with appropriate people on their own terms and engage in a more meaningful, richer and focused discussion.

It is recognised that the Hearson Cove has significant recreation value for the local community, as well as for visitors and tourists. Therefore, workshops were undertaken with local community groups to understand broader community values associated with Hearson Cove Foreshore to ensure a strong understanding of cultural and management values associated with the foreshore.

Meetings were undertaken with the following groups over Workshops 1 and 2:

- Yaburara and Coastal Mardudhunera Aboriginal Corporation (YacMac); and,
- Murujuga Aboriginal Corporation (MAC) - Presentation to the Murujuga Circle of Elders.

Hearson Cove Stakeholder Reference Group

Presentations and discussions were held with the Hearson Cove Stakeholder Reference Group on two occasions during the design process. The meetings included discussions on:

- Opportunities and Directions (Workshop 1) - 18th November 2015; and,
- Draft FMP (Workshop 2) - 17th February 2015.

2.4 report outline

In order to provide a framework to guide the ongoing management of this unique stretch of coastline, this report initially establishes the unique foreshore context of Hearson Cove. Part 3 // Background and Context Analysis, provides an overview of:

- Planning context;
- Cultural heritage;
- Environmental values; and,
- Social values.

This Background and Context Analysis acts as a precursor to Part 4 // Key Themes, which outlines a set of key themes to drive the long term, sustainable management of the Hearson Cove Foreshore. These themes have been distilled from the background review and community and stakeholder and engagement.

A site level S.W.O.T. (Strengths, Weaknesses, Opportunities and Threats) analysis has been undertaken for each key theme, which provides the background for the development of Part 5 // Management Plan and Management Actions.

Part 5 // Foreshore Management Plan and Management Actions, includes:

- Foreshore Management Plan, the development of which is guided by the key themes; and,
- Management actions, outlining an implementation schedule (Recommended actions, responsibility, and staging).

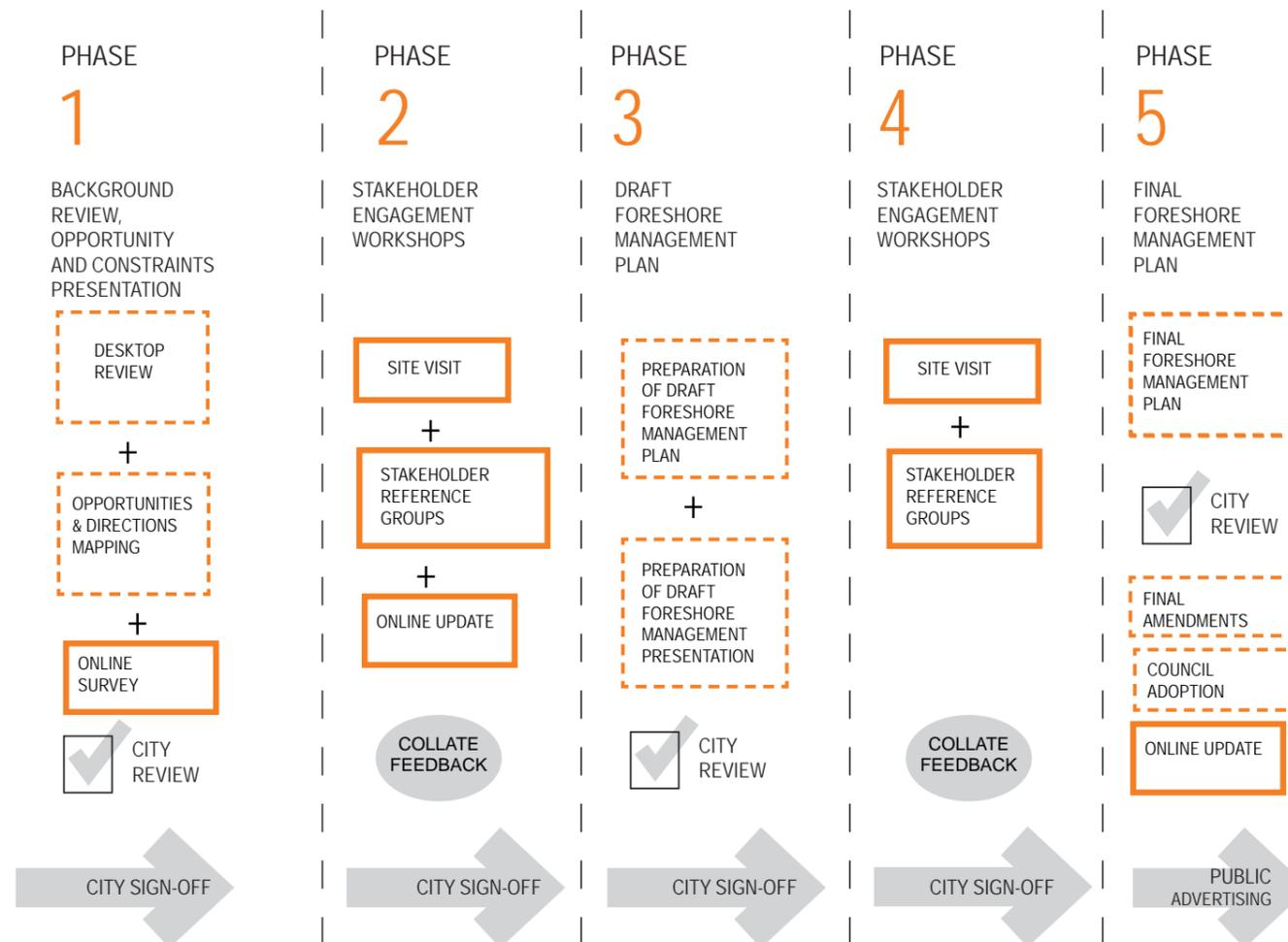


Figure 2. Collaborative design process

3.1 location

Hearson Cove is located on the Burrup Peninsula, part of the Dampier Archipelago, known as Murujuga by the area's Traditional Custodians. The archipelago is a collection of 42 island, islets and rocks covering an area of approximately 400km². The Burrup Peninsula, 27km long and 5km wide is a significant landscape of intersecting values, of which the Hearson Cove foreshore reflects. At this foreshore area, the needs of surrounding land uses, including recreation, industry, environment, heritage and culture, need to be balanced.

The Hearson Cove foreshore is a significant amenity with strong social value for locals and visitors to the City of Karratha. One of the area's most accessible beaches, and in close proximity to the township of Dampier as well as Karratha (refer Figure 3), it is an important asset for the City of Karratha.

Hearson Cove is sited in an area of strong economic significance, within the resources hub that is Australia's North West. Within immediate vicinity of the foreshore is the Burrup Peninsula's Strategic Industrial Area (SIA), with major industrial developments serving the state's resources industry.

The environmental and conservation value of Hearson Cove must also be noted, for both the cultural value of the archaeological features and broader landscape and for the biodiversity that the area supports. The archipelago is the site of the largest concentration of rock art in the world (Murujuga in the Pilbara, 2015). Along with this rock art comes cultural heritage sites such as shell middens, quarries and stone features (Bird and Hallam, 2006).

The environmental and geomorphological value of the area is strongly unique, with steep and inaccessible topography where much of the peninsula provides a refuge for a diverse range of flora and fauna, providing a protected representation of the biodiversity of the Pilbara.

Additionally, Hearson Cove is a site of significant cultural value to many Aboriginal groups. Access to, management of and time spent at Hearson Cove provides a strong connection to a living culture for people who have been caring for Murujuga and the surrounding country for tens of thousands of generations.

With high visitor numbers and within close proximity to other sites of tourism significance on the peninsula, Hearson Cove and its management is of great importance, as one of the most visited and readily accessible stretches of coastline on the Burrup Peninsula and Dampier Archipelago, Murujuga.

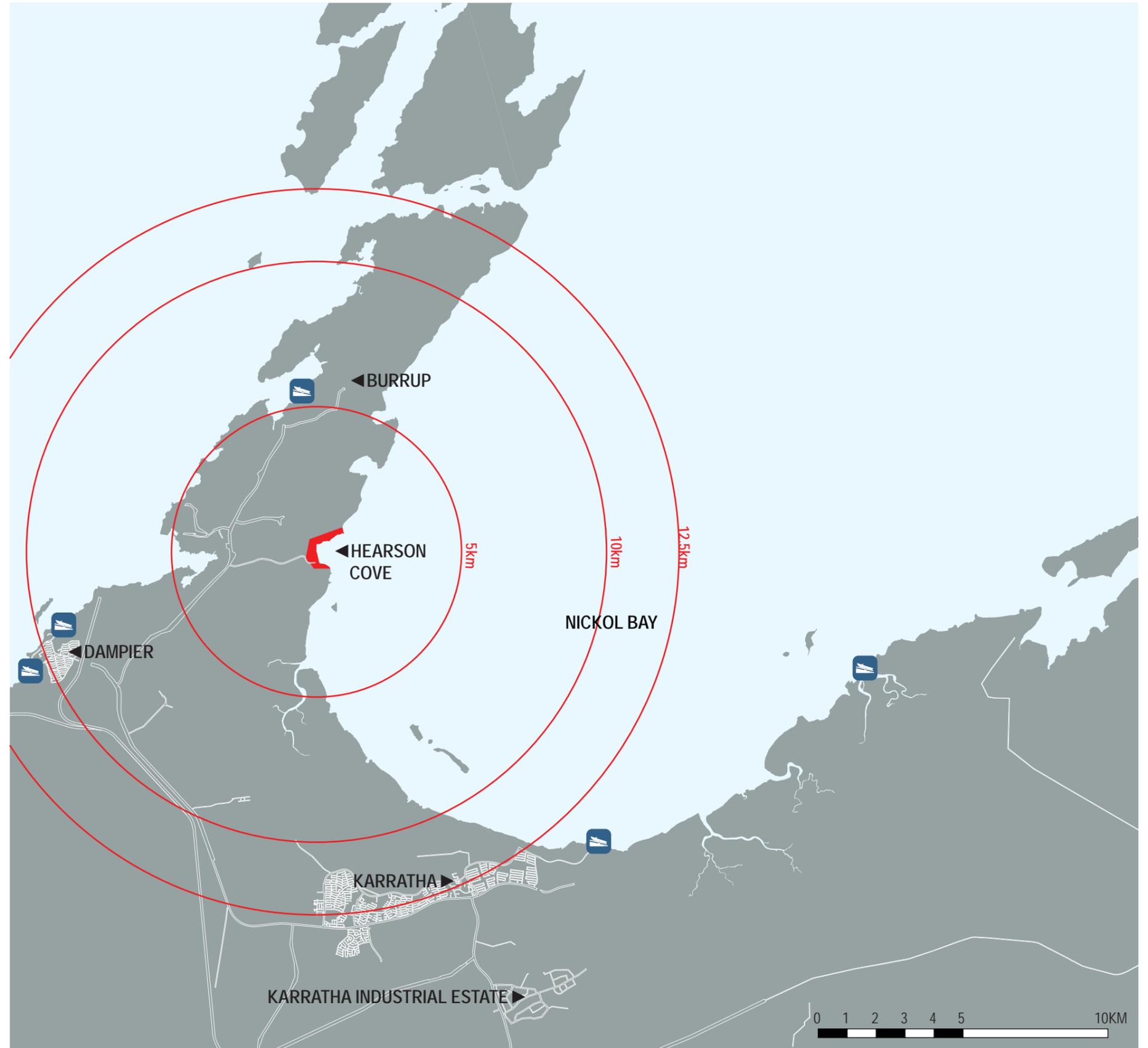


Figure 3. Site context - Scale: 1:150,000 at A3

3.2 planning context

The planning context for the FMP includes consideration of the City of Karratha's broader Coastal Planning Framework, as well as, an examination of the general planning, tenure and land use as is relevant to the Hearson Cove foreshore. Hearson Cove is in close proximity to a number of different land uses which are of relevance to its broader planning context, subsequently having an effect on land use at the foreshore. The Hearson Cove Foreshore Reserve remains outside the boundaries of the land determined for industrial development and for conservation within the Burrup and Maitland Estates Agreement (BIMEA), discussed further in the following section. However, the foreshore area is immediately adjacent to and surrounded by the conservation area, Murujuga National Park, and beyond that, the land determined for industry, the Strategic Industrial Area (SIA). With this context in mind, the City of Karratha works with the Murujuga Aboriginal Corporation, through the Murujuga Parks Council, as well as industry, towards shared management goals for Hearson Cove.

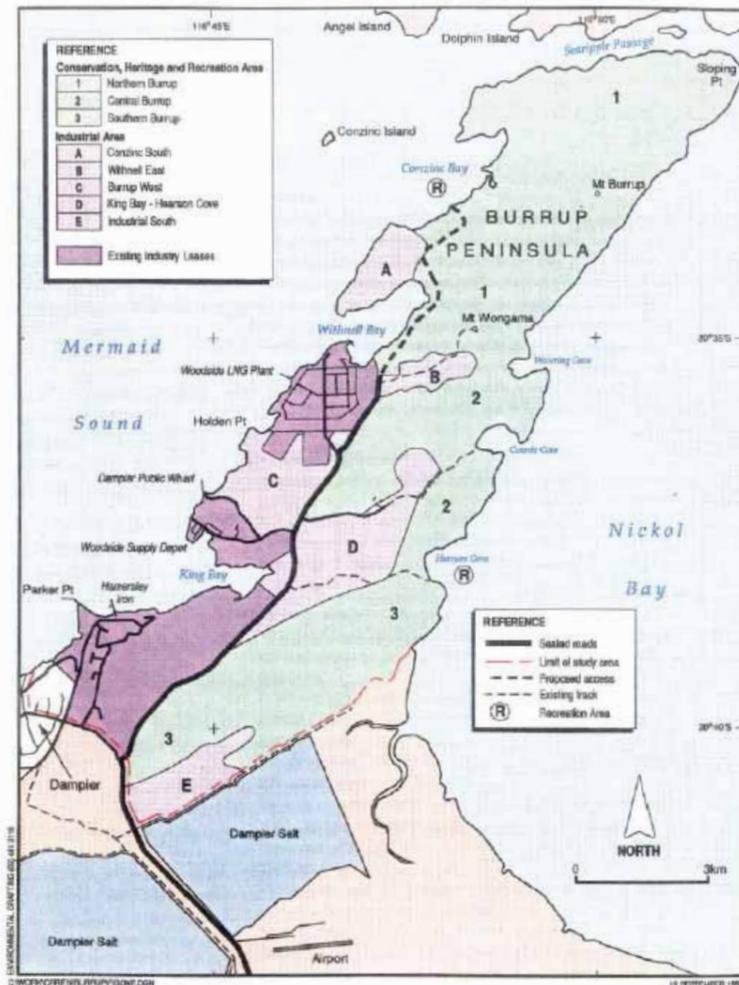


Figure 4. Burrup Peninsula and Land Use Management Strategy
- Scale: NTS (O'Brien Planning Consultants, 1996)

3.2.1 Burrup Peninsula Land Use and Management Strategy

This strategy was undertaken in September 1996, while Native Title claims were current on the peninsula and prior to the Burrup and Maitland Industrial Estates Agreement (BIMEA) of 2003.

The Burrup Peninsula and Land Use Management Strategy divides the Peninsula into Conservation and Industrial Areas, and then moves on to further divide the Industrial and Conservation areas on the Peninsula into separate zones, making specific recommendations for each area. Hearson Cove falls in to Central Burrup (Policy Area 2) – Conservation, Heritage and Recreation Area 2 (Refer Figure 4).

This strategy provided the overarching planning and land use strategy for the Burrup Peninsula, pertaining to land north of Dampier Road (DEC, 2013).

3.2.2 Shire of Roebourne Town Planning Scheme No. 8 and Amendment No. 27

The Hearson Cove foreshore is sited within a 59.95ha reserve vested in the City of Karratha for the purposes of Parks and Recreation, as a part of Town Planning Scheme No. 8.

Town Planning Scheme No. 8 lists three (3) Burrup Peninsula objectives, being:

- i. Retain an appropriate balance between the Burrup's recreational, industrial, and environmental and heritage assets;
- ii. Acknowledge Hearson Cove as a key recreational node; and,
- iii. Adopt the principles and policies of the Burrup Peninsula Land Use and Management Strategy.

As stated in City of Karratha's Report on Amendment No. 27, Clause 7.5 of Town Planning Scheme No. 8 "establishes requirements within the Storm Surge Risk Special Control Area, and with reference to certain sensitive categories in the zoning table of the planning scheme (i.e. residential, commerce or health, welfare or community) specifies Council's ability to consider proposals within an area of land known to be affected by a 100 year ARI storm surge event."

Amendment No. 27 modifies this clause to remove any ambiguity around Clause 7.5.

3.2.3 Burrup and Maitland Industrial Estates Agreement (BIMEA)

In 2003, there were three Native Title claims current to the Burrup Peninsula, the claimants being the Ngarluma-Yindjibarndi, the Yaburara-Mardudhunera and the Wong Goo TT OO. The BIMEA was a negotiated agreement between the State Government and these groups.

The agreement allowed:

- State government to compulsorily acquire any Native Title rights and interests in the area of the Burrup Peninsula, as well as certain parcels of land near Karratha;
- Industrial development to process along Southern parts of the Burrup Peninsula;
- The establishment of a conservation estate which aimed to protect Aboriginal heritage; and,
- Economic and community development for the five groups represented by the three Native Title claimants groups, including education, training etc. (WAPC, 2009)

One of the many outcomes was the division of land on the Burrup into land for industrial development as well as designated 'Burrup non-industrial land'. This non-industrial land was transferred to Native Title claimants under a lease back arrangement and later became the Murujuga National Park. This land borders the Hearson Cove foreshore area (DEC, 2010).

3.2.4 State Planning Policy 2.6: State Coastal Planning Policy

Where appropriate, development in this foreshore area should be assessed to apply the strategic measures acknowledged within the State Coastal Planning Policy 2.6 (2013).

Key applicable sections include:

- Section 3 - Development and settlement;
- Section 4 - Coastal hazard risk management and adaptation planning;
- Section 7 - Public interest;
- Section 8 - Coastal foreshore reserve; and,
- Section 9 - Coastal strategies and management plans.

3.2.5 Draft City of Karratha Coastal Planning Strategy

The Hearson Cove FMP is a part of the City of Karratha's proposed Coastal Planning Strategy (2015) as shown in Figure 5, currently in Draft format. The purpose of the Coastal Management Strategy is to 'provide a framework to conserve and sustainably develop the City of Karratha's coastal and foreshore areas while planning for, and managing competing land use pressures.' (City of Karratha, 2015)

The Coastal Management Strategy identifies 10 coastal nodes along the City of Karratha's Coastline which correspond to existing coastal settlements or popular recreation and access nodes. It is recommended that a FMP is completed for each of the nodes. Figure 5 provides a summary of the current status of each of the respective FMPs.

When available, the City of Karratha Coastal Planning Strategy should be referred to, as is relevant.

3.2.6 Draft City of Karratha Local Planning Strategy

When available, the City of Karratha Local Planning Strategy should be referred to, as is relevant.

3.2.7 City of Karratha, Draft Storm Surge Risk Area, Local Planning Policy

Where appropriate, development in this foreshore area should be assessed applying the strategic measures acknowledged within the Draft Storm Surge Risk Area Local Planning Policy.

3.2.8 State Planning Policy 4.1 - State Industrial Buffer

On the Burrup there is no formally defined industrial buffer zone (Sinclair Knight Merz, 2001). However, various buffers, or separation distances, are in place for the nearby Yara Pilbara Nitrates Plant and the Yara Pilbara Fertilisers Plant. The proximity of these industries has implications on the use of the foreshore area.

Likewise, the presence of sensitive land uses in the Hearson Cove area may result in significant restrictions on the operations of existing industries in the vicinity, and on the development potential of the remaining vacant sites.

It has been confirmed by Yara that there are no buffer zones defined by either Yara Pilbara Fertilisers or Yara Pilbara Nitrates that would impact upon the Hearson Cove Foreshore Reserve.

Should further investigations be undertaken into formal buffer areas between the industrial zone and the foreshore area in accordance with the Environmental Protection Authority's Draft Environmental Assessment Guidance for Separation Distances between Industrial and Sensitive Land Uses (2002) and State Planning Policy 401 State Industrial Buffers, it will be necessary to ensure that any such buffer does not compromise plans for use and enjoyment of surrounding non-industrial areas.

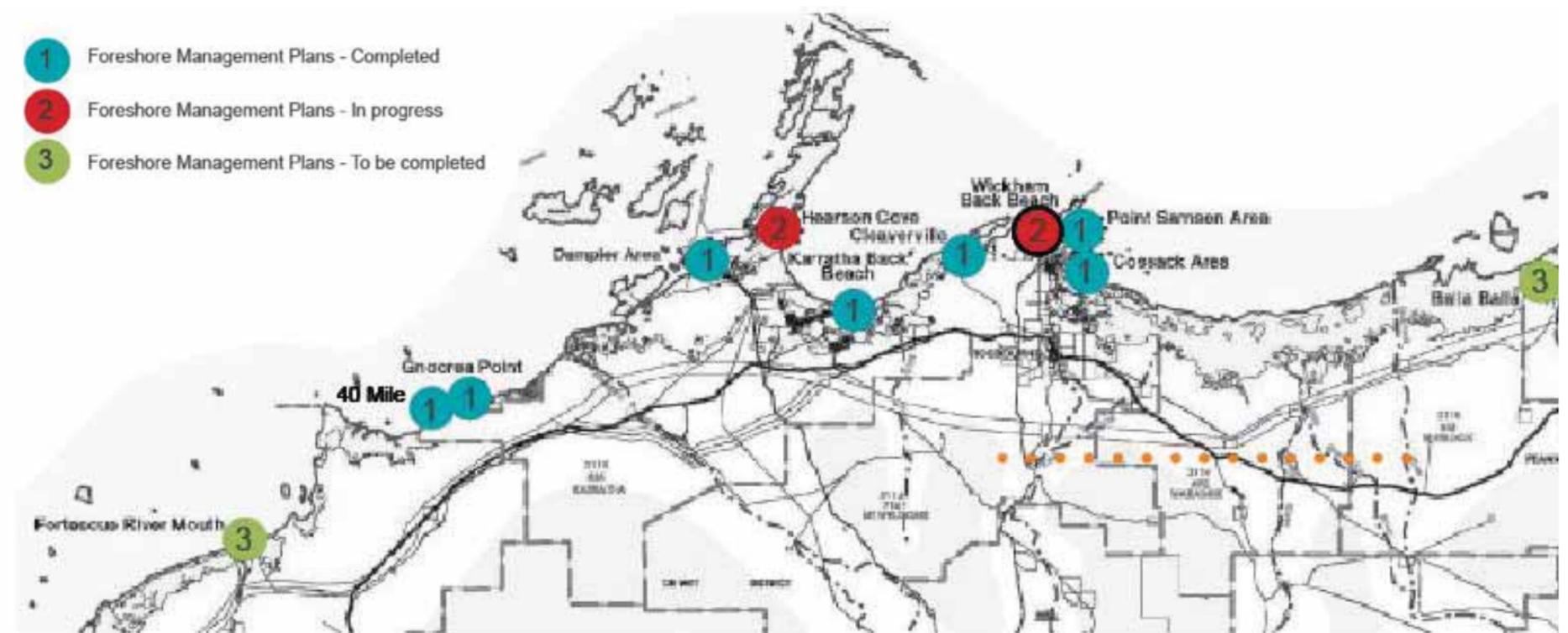


Figure 5. City of Karratha Draft Coastal Planning Strategy (2015) - Scale: NTS (City of Karratha)

3.3 land use and tenure

The Hearson Cove foreshore is contained within Reserve 47014, vested in and managed by the City of Karratha. As a part of Town Planning Scheme No. 8, the foreshore reserve is zoned as Conservation, Recreation and Natural Landscapes.

- Reserve No. 47014, Vested in the City of Karratha, Purpose – Parks and Recreation, Area – 59.95 ha
- TPS Zoning, Reservation: Public Purposes, Open Space: Conservation, Recreation and Natural Landscapes

Reflecting the multiple and intersecting interests on the Burrup Peninsula, the foreshore is adjacent to and in close proximity to a number of different land uses which impact the current use and management of the foreshore area, as referred to in greater detail below.

strategic industrial area

Further inland from the Murujuga National Park is the Burrup Peninsula's Strategic Industrial Area (SIA) (refer Figure 6). The Strategic Industrial Area is the industrial estate, with areas designated for both current and proposed future industrial development. In the city of Karratha Town Planning Scheme No. 8, the Strategic Industrial Area is zoned as Strategic Industry.

Various industries are located within this area, including:

- **the Woodside North West Shelf Venture Project** – joint venture between Woodside, Shell, BHP Billiton, BP, Chevron, and Japan Australia LNG (MIMI) - one of the world's largest LNG producers, supplying oil and gas to the Western Australian and international markets from offshore gas and condensate fields;
- **the Woodside operated Pluto LNG plant** - a major LNG gas project with onshore gas processing facilities that processes gas from the Pluto and Xena gas fields;
- **the Yara Pilbara Fertilisers plant** - one of the world's largest ammonia producers; and,
- **the Yara Pilbara Nitrates plant**, currently under construction.

Also significant to this area is the operations of the Pilbara Ports Authority in King Bay, on the west coast of the peninsula., Dampier Port currently the world's third largest bulk export port (Dampier Port Authority).

In closest proximity to Hearson Cove Foreshore are the Yara sites, a part of the SIA immediately beyond the Hearson Cove dunes, separated by a stretch of National Park land (refer Figure 7).

Several lots are currently for lease on the peninsula (LandCorp, 2015). The proximity of continued industrial land for development on the peninsula is of significance to the ongoing development of Hearson Cove, with implications for cultural and recreational use of the site. There is also opportunity for additional and strengthened partnerships between the City of Karratha and industry to support improvements at the Foreshore area.

murujuga national park

Immediately surrounding the subject site is Murujuga National Park (refer Figure 7). Murujuga National Park, also zoned as a part of Town Planning Scheme No. 8 as Conservation, Recreation and Natural Landscapes (refer Figure 6), encompasses an area of 4913ha on the Burrup Peninsula, including the area surrounding Hearson Cove.

In 2013, following the BIMEA of 2006, Murujuga National Park was declared Australia's 100th national park, and is the first to be owned in freehold by Aboriginal people. The Aboriginal groups who care for Murujuga today are Ngarluma, Yindjibarndi, Mardudhunera, Yaburara and Wong Goo TT OO. These groups are represented by the Murujuga Aboriginal Corporation (MAC) (Murujuga in the Pilbara, 2015).

proposed marine reserve

The waters off the coast of the Hearsons Cove foreshore are a proposed Marine Reserve (refer Figure 7), of significance to the ongoing use and management of the Hearson Cove foreshore area.

australian national heritage list

In 2007, much of the Dampier Archipelago was added to the Australian National Heritage list, including the areas immediately surrounding, but not including, Hearson Cove (refer Figure 6). It covers areas of National Park, and as well encompassing areas on the surrounding peninsula and islands.

National Heritage Areas are protected under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), which contains provisions for the protection and management of nationally listed threatened species and ecological communities.

Development in this area is to be referred to the Commonwealth to decide whether an environmental impact assessment is required. Additionally, if any area within the boundaries of the National Heritage place is destroyed or damaged, the Commonwealth may investigate or prosecute (Department of the

RESERVE NO	PURPOSE	MANAGEMENT	ROEBOURNE TPS NO. 8 ZONING SCHEME	NOTES
Reserve 47014	Parks and Recreation	Vested in the City of Karratha	Conservation, Recreation and Natural Landscapes Reservation: Public Purposes, Open Space.	
Reserve 49120	Industrial Development	Unvested. Management responsibility is assumed by the Department of State Development	Strategic Industrial	Heavy industrial users operate in this area, for example, Woodside, Yara Pilbara Fertilisers, etc. Several lots are currently for lease
N/A	National Park	Murujuga Aboriginal Corporation and Department of Parks and Wildlife	Conservation, Recreation and Natural Landscapes	Freehold land owned by Murujuga Aboriginal Corporation, leased back to the state for peppercorn rent and jointly managed by MAC and DPaW via the Murujuga Parks Council

Table 1. Tenure in the immediate vicinity of Hearson Cove



Figure 6. Land use - Scale: 1:15,000 (Burrup Peninsula and Land Use Strategy)

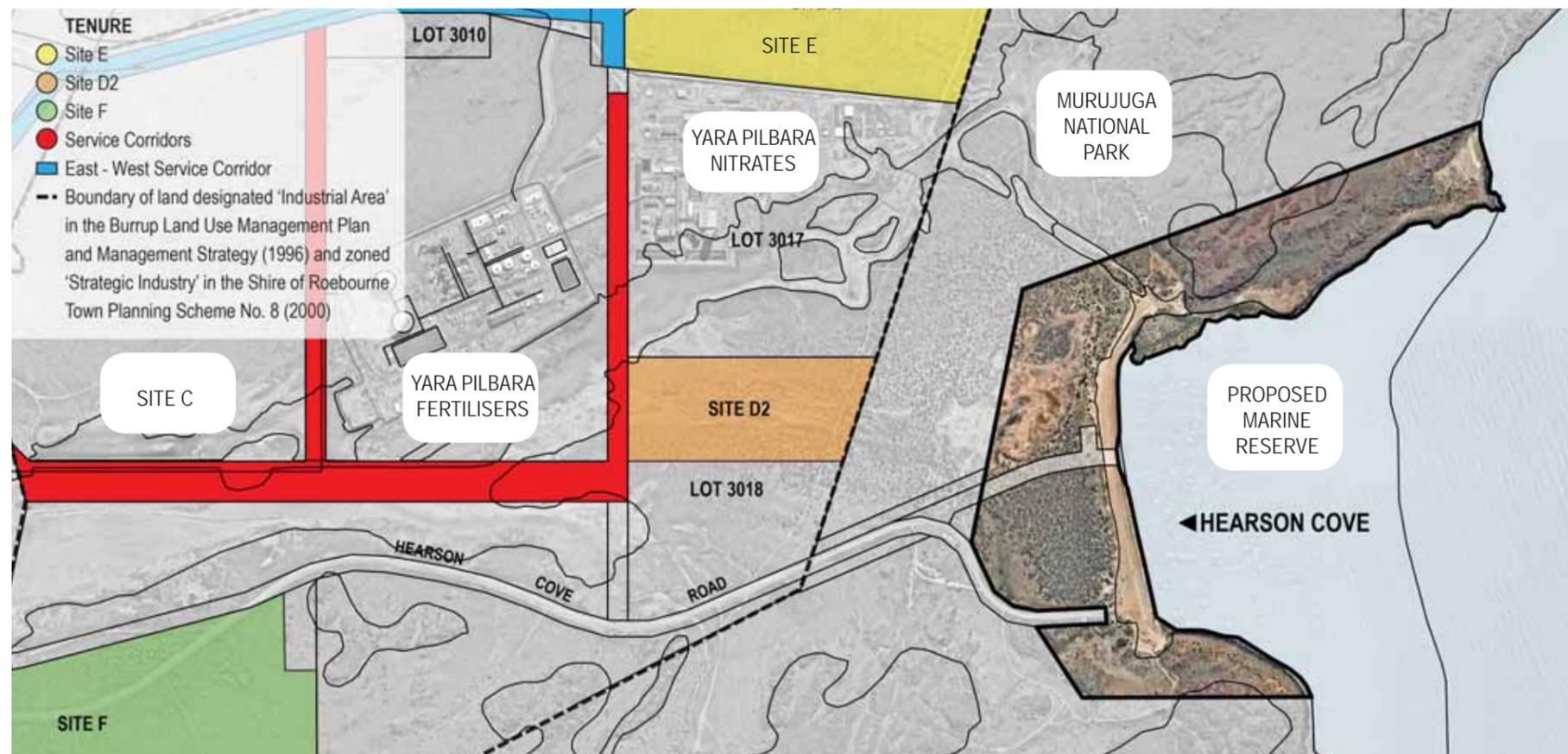


Figure 7. Tenure - Scale: 1:15,000 (Burrup Peninsula and Land Use Strategy)

3.4 current management practices

city of karratha

The responsibilities of the City of Karratha include the development and maintenance of the area, including picnic facilities and shade shelters, access and parking, safety of visitors and rubbish removal.

The City of Karratha Waste Management team attend the Hearson Cove foreshore area twice weekly, for litter picking and bin collection on Mondays and Thursdays. There are five bins at the foreshore area. The Works team provides maintenance for the existing shelters, toilets, and woodfire BBQs, which is minimal.

The Parks and Gardens team responds to specific events and attendance at the foreshore is largely reactionary, for example, for the removal of broken glass and large debris.

The City of Karratha Ranger Team attend the Hearson Cove foreshore area on a regular basis, on a fortnightly schedule, and more regularly in response to specific events. For example, during peak tourist season, Ranger attendance can increase to daily. The Ranger Team largely attend to manage community and visitor use of the area. Issues noted by the City of Karratha Ranger team include:

- Illegal camping, especially during peak tourist season (Winter months); and,
- Use of quad bikes and trail bikes and the flow on effect of this on dune health.

murujuga aboriginal corporation (murujuga land and sea unit and circle of elders) + DPaW

Murujuga National Park is jointly managed by MAC and the Department of Parks and Wildlife (DPaW), through the Murujuga Parks Council. The day-to-day running of the park is managed by Murujuga people, through a system of cultural governance made up of the Murujuga Land and Sea Unit (MLSU) and the Murujuga Circle of Elders (CoE), who provide cultural clearance and advice.

The Murujuga Land and Sea Unit (MLSU) comprises a local Ranger team who carry out daily work caring for Murujuga County. Their work can include weed control, cultural heritage surveys, rubbish removal, and engagement with visitors, flora and fauna monitoring, rock art monitoring, revegetation and graffiti removal.

National Park area surrounds the Hearson Cove reserve, subsequently the reserve area is an access point to the National Park. It is adjacent to the National Park area, with overlapping management issues.

An initial management plan was established for the Murujuga National Park by DPaW, then DEC, in 2013. Given the National Park's proximity to the Hearson Cove Foreshore, there are a number of National Park objectives which have relevance to the foreshore area, in areas such as hydrology, fauna, flora etc. These objectives have been taken in to account throughout the foreshore management planning process, and are summarised as follows:

- Hearson Cove needs to be managed in a way that is not in conflict with the management of the adjacent National Park;
- Ensure license conditions for industrial wastewater emissions protect water quality in low lying areas of King Bay-Hearson Cove valley; and,
- Ensure that industry stormwater management protects the supratidal flats of the King Bay-Hearson Cove valley.

Hearson Cove is relevant to and features in management plans for the Murujuga National Park. Culturally, Murujuga is not limited by the boundaries of the National Park – it encompasses the entire Dampier Archipelago. For this reason, the work of the MLSU Rangers includes work patrolling and caring for all of Murujuga Land and Sea, including Hearson Cove.

Currently in progress (2014 - ongoing), the Murujuga Cultural Management Plan is a document which outlines the vision that Murujuga people have for their Country. Their vision is captured in the plan through targeted goals and aims for the management of the Murujuga National Park and the broader Dampier Archipelago, Murujuga through the work of the Murujuga Land and Sea Unit (MLSU) as guided by the Murujuga Circle of Elders (CoE). Many of these aims have direct relevance to the future management of Hearson Cove.

city of karratha community

The community of the broader City of Karratha has been involved in volunteer programs at the Hearson Cove foreshore, including community clean ups and graffiti removal. It has been noted anecdotally that the community clean up day at Hearson Cove was one of the most highly attended community volunteer events in Karratha.

department of transport

At present, motorised water vessels are permitted in the northern half of the Hearson Cove bay only. Small vessels are able to launch, informally, at the northern end of the bay. There are boat ramps at Dampier and Karratha (refer Figure 1). Department of Transport note Withnell Bay as a boat launch area on their guide to the area, though there is not a boat ramp at this beach.



Image. Murujuga Rangers on a regular patrol at Hearson Cove (UDLA)



Image. Beaky's mob clean up Hearson Cove, Clean Up Australia Day, 2010 (Flickr: Keep Australia Beautiful WA).

3.5 cultural heritage

3.5.1 aboriginal

This FMP acknowledges the Traditional Custodians of the Hearson Cove Foreshore Area, and of Murujuga. As stated in the City of Karratha Indigenous Engagement Strategy (2016), *'the City of Karratha recognises Aboriginal people as the Traditional Custodians of this land who have a deep historical and spiritual connection to Country, waterways, rivers and seas within our region.'*

The Burrup Peninsula, or Murujuga, has been cared for by Aboriginal people for tens of thousands of generations. Today, five groups come together to care for Murujuga – Ngarluma, Yindjibarndi, Yaburara, Wong Goo TT OO and Mardudhunera.

The Dampier Archipelago and Burrup Peninsula, Murujuga, houses the largest concentration of rock art in the world (Critchley), with evidence of human occupation that reaches back 30,000 years. Along with this rock art comes archaeological sites such as shell middens, quarries and stone features (Bird and Hallam, 2006).

These sites are not relics of a bygone era. For the Aboriginal groups who care for Murujuga Country today, these rock art and archaeological sites are part of living culture and a complex belief system that determines the way they live on and care for Country, the significance of which stretches far beyond the reaches of the peninsula itself.

As stated by Ron Critchley, immediate past CEO of the Murujuga Aboriginal Corporation, *"The Burrup rock art records the law of Aboriginal groups stretching North to Kununurra, south past Carnarvon and all the way to Alice Springs. It is the 'bible' of their law that is still practiced today."*

This living heritage directly informs the way Murujuga, including Hearson Cove, is managed by its Traditional Custodians today.

In total, ten sites within the Hearson Cove area have been lodged and/or registered with the Department of Aboriginal Affairs as having cultural significance (City of Karratha, information supplied). This FMP recognises these registered sites as a starting point, however DAA registration is static and sometimes inaccurate, and has limitations in representing an integrated living cultural landscape, and the complexity and breadth of cultural heritage present on the Burrup Peninsula.

3.5.2 european

The Dampier Archipelago, Murujuga, was an area central to European colonisation of the North West coast. Hearson Cove was the point from which F.T. Gregory made camp in 1861 to make initial explorations inland. The European naming of the Cove was by Gregory, after Hearson, a member of his crew who was accidentally shot.

Gregory advised the area ideal for settlement, and colonisation of the North West began in 1863, with the establishment of the pastoral, whaling and pearling industries, the latter of which was focused at the Archipelago before moving to Broome in 1890.

The Local Government Heritage Inventory Place Record List, which focuses on post-contact history of the City of Karratha, includes Hearson Cove, due to its significance as F.T. Gregory's landing place, as well as the Dampier Archipelago in its entirety (Shire of Roebourne, 2013).

The early development of industry in the North West in the 1860s formed the beginnings of what is now a strong resources industry in this area. Figure 8 illustrates the recent history of the Hearson Cove Foreshore area and the swift industrial development on the Peninsula from the 1960s onward.

Refer Part 5 // Management Plan and Management Actions for further information and management actions on how both the European and Aboriginal cultural significance of this area may be acknowledged and managed.



Figure 8. Recent changes at the Hearson Cove Foreshore Area (NearMap, Pilbara Ports)

3.6 environmental values

3.6.1 geomorphology, land system and land form

geomorphology

Hearson Cove is located on the east coast of the Burrup Peninsula, which forms part of the Dampier Archipelago, Murujuga. The petrological formations, or rocks, that make up the peninsula are some of the oldest on earth and were formed through volcanic events at the end of the Archean Period between 3,300 and 2240 million years ago.

The Archipelago is made up of islands, reefs, shoals, channels and straits, rising above a now submerged plain of limestone pavements, large sheets of shell gravel, sand and other sediments. (Dampier Arch – Heritage inventory). This landscape was formed over many thousands of years of sea level rise, as mountains ranges rising out of a flat plain gradually flooded. 6,000 to 8,000 years ago, it became the archipelago we see today. (Bird and Hallam, 2006)

Prior to the industrial development of the 1960s, the peninsula was then Dampier Island, separated from the mainland by tidal mudflats. During the 1960s, a causeway was built to connect the newly constructed port and town at Dampier to the mainland, and the island became a peninsula.

The Hearson Cove foreshore is at the intersection of not only layers of cultural, industrial and social values but also at the intersection of the two geomorphologies which define the peninsula. The northern and southern areas of the peninsula are characterised by steep slopes and ridges of fractured red brown gabbro and granophere (DEC, 2013), randomly placed boulder piles formed through an ancient weathering processes (Shire of Roebourne, 2013). Bisecting these areas of steep topography is an area of low lying supratidal mudflats between King Bay and Hearson Cove, one to two kilometres wide - the King Bay-Hearson Cove valley.

Hearson Cove is located at the eastern edge of the King Bay-Hearson Cove valley. This valley is one of the most accessible areas on the peninsula, as it is low lying and free of the dramatic, rocky topography which makes the north and south areas of the peninsula largely inaccessible and inappropriate for industrial development. The access provided to industrial areas has also allowed easy access to recreational users of Hearson Cove and Withnell Bay (DEC, 2013).

While access to Hearson Cove foreshore is provided via the flat expanse of the tidal mudflats, the experience on the beach is enhanced by the rocky character type which surrounds the visitor to the north and south and provides and immersive experience whilst on the beach.

The east coast of the peninsula also forms the western arm of the expansive embayment of Nickol Bay, Hearson Cove being typical of this context - a small tidal beach with shelly sand, broad tidal flats and rocky headlands to the north and south. At the northern end of the cove is a mangrove community and a small ephemeral stream (Eliot et. al., 2013).

land systems and land form

There are two major morphological areas present on the Burrup Peninsula, classified in the report, Geology, Geomorphology and Vulnerability of the Pilbara Coast, as Land Systems, as follows:

- Rocklea Land System; and,
- Littoral Land System.

The steep, rocky topography of the north and south of the peninsula is defined as the Rocklea Land System, and the tidal mudflats and dunes, or inundation zone, of the King Bay-Hearson Cove valley, are defined as the Littoral Land System. For descriptions of these land systems types, as excerpted from the Pilbara Coast Report, refer Table 1.

Land systems can be represented in further detail through a division in to specific land form types. The coastal areas of the Dampier Archipelago, Murujuga, are characterised by their biodiversity and complexity, and Hearson Cove is representative of this.

As noted in the Pilbara Coast report, the following land form types are evident at Hearson Cove, described in further detail in Table 1:

- High basalt hills;
- Rugged granitic hills;
- Mangrove flats;
- Coastal beach and dune deposits; and,
- Supratidal flats.

Additional to the land forms mentioned in the Geology, Geomorphology and Vulnerability of the Pilbara Coast is the marine system of the Intertidal flat, the coastal tidal zone that is periodically inundated through tidal changes. Though outside the study area, this zone is significant to the analysis and experience of Hearson Cove.

- Intertidal flats.

The land form types and their qualities are outlined in Table 2, as excerpted from the Pilbara Coast Report.

coastal vulnerability

The Pilbara Coast report is a document which provides an analysis of the instability and susceptibility of the land forms of the Pilbara coast, in order to assess the vulnerability of each area.

Instability is defined as the level to which land forms are responsive to short term environmental variability, or change. Susceptibility makes note of coastal land systems as defined by characteristics of natural structures, and considers capacity for coastal change to reach a tipping point. It is a consideration of long term changes. Together, instability and susceptibility provide a holistic vulnerability ranking.

The land form types of the Hearson Cove Foreshore as outlined in the Pilbara Coast report. Figure 9, right, maps these land form types. The associated stability of these land form types is listed Table 2. It can be ascertained that the mangrove flats and coastal beach and dune deposits - areas of low relief - are the most unstable in the area.

Aligned with this, a high level suggestion is that any provision of built form or amenity be focused toward the north or south of the subject site. Development in this foreshore area should be assessed applying the strategic measures acknowledged within the *City of Karratha Storm Surge Risk Area Local Planning Policy*, and a detailed coastal vulnerability study should be undertaken.

3.6.2 acid sulfate soils

Acid sulfate soil is the name given to soil containing iron sulfides which when exposed to air can release sulfuric acid. According to Burrup Nitrates Pty Ltd, there is a moderate to low risk of acid sulfate soils occurring within 3m of the surface with the areas of mangrove flats, coastal beach and dune deposits and supratidal flats. There is no known risk within the land form types of high basalt hills and rugged granitic hills.

It must be noted that it has been listed as a high to moderate risk within the area of intertidal flats, which is in close proximity to the subject site. This area is unlikely to be disturbed due to its ecological significance, and is proposed as a future marine reserve.

Aligned with the conclusion made for coastal vulnerability, any provision of built form or amenity on this subject site should be focused toward the north or south of the subject site, where land forms are at least risk of acid sulfate soils.

It is recommended that a detailed study of acid sulfate soils is undertaken prior to extensive development and detailed design decisions are undertaken in this foreshore area.



Image. View across the Hearson Cove-King Bay valley at high tide (Instagram: @emmaajaan).

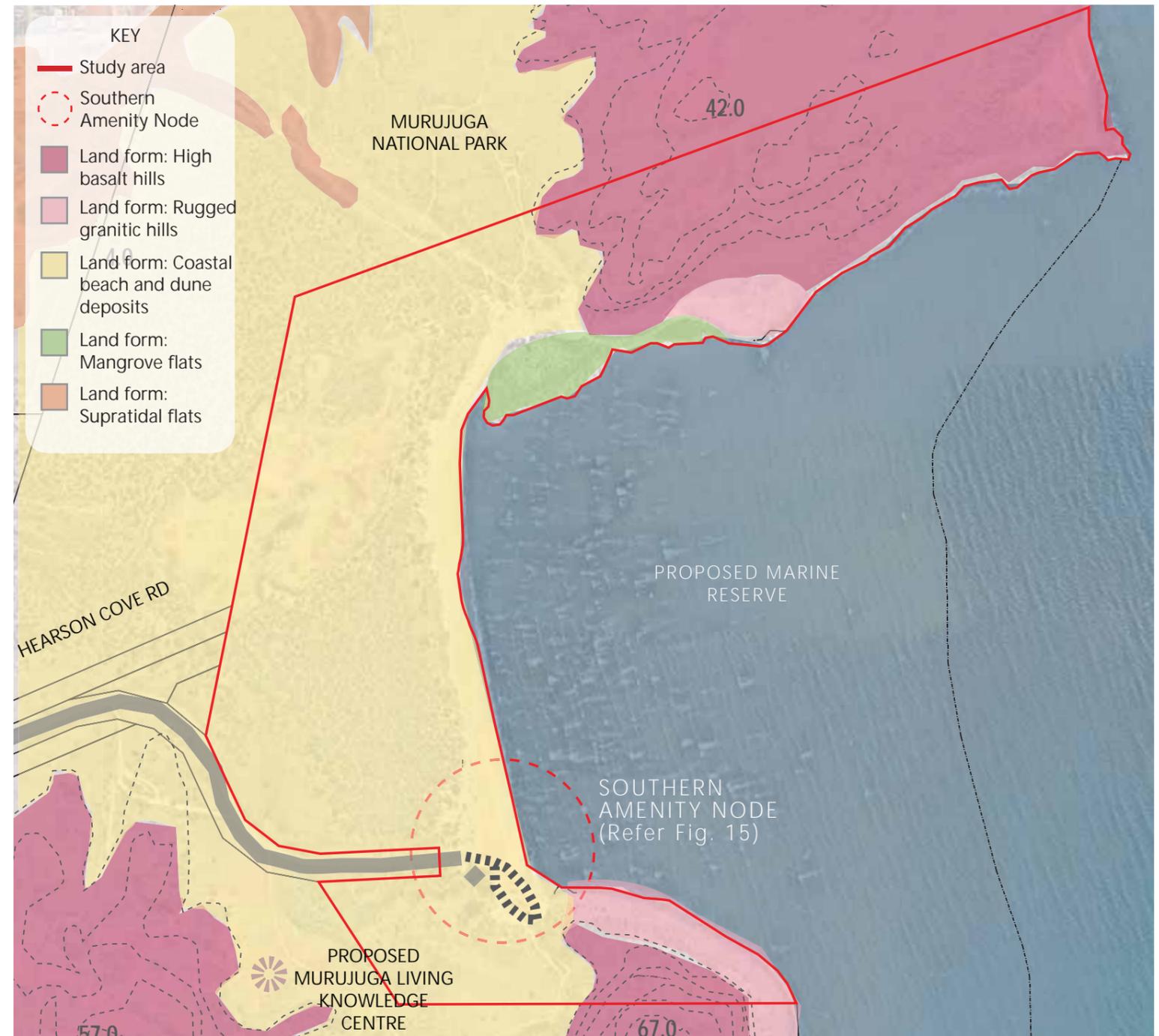
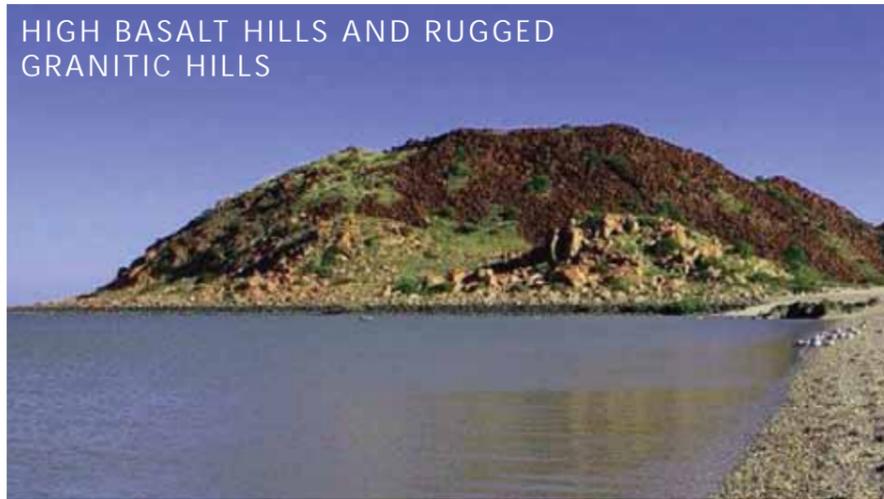


Figure 9. Land form - Scale: 1:7,500 at A3





HIGH BASALT HILLS AND RUGGED GRANITIC HILLS



DUNE DEPOSITS TO COASTAL BEACH



INTERTIDAL FLATS

Figure 10. Land form types

LAND SYSTEM	DESCRIPTION	GEOLOGY	GEOMORPHOLOGY
Littoral Land System (Lt)	Bare coastal mudflats with mangroves on seaward fringes, samphire flats, sandy islands, coastal dunes and beaches.	Quaternary mudflat deposits, clay, salt and sand, eolian sand.	Depositional surfaces; saline coastal flats; estuarine and littoral surfaces with extensive bare saline tidal flats subject to infrequent tidal inundation, slightly higher samphire flats and alluvial plains, mangrove seaward fringes with dense branching patterns of shallow tidal creeks, minor coastal dunes, limestone ridges, sandy plains and beaches; relief up to 8 m.
Rocklea Land System (Rk)	Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft spinifex) grasslands.	Archean basalt, Lower Proterozoic basalt, dolerite, tuff and agglomerate, minor shale and jaspilite.	Erosional surfaces; hills, ridges and plateaux remnants on basalt with steep stony slopes, restricted lower slopes, stony interflues and minor gilgai plains; moderately spaced tributary drainage patterns of small channels in shallow valleys in upper parts becoming broader floors and channels downslope; relief up to 110 m.

LAND FORM	DESCRIPTION	RELATIVE INSTABILITY
Supratidal flat (Mf)	Un-vegetated, low gradient mudflat; only inundated during extreme high tides and storm surge events; soils are calcareous silts and sands with authigenic silt and gypsum.	High (unstable) - Management responses require repeated installation or repair of major stabilisation works
Mangrove flats (Mf)	Flat to gently inclined surface vegetated by dense thickets of <i>Avicennia marina</i> up to 4 m high on an organic-rich muddy substrate.	High (unstable) - Management responses require repeated installation or repair of major stabilisation works
Coastal beach and dune deposits (Bk)	Shelly sand in coastal dunes and old beach deposits; contains <i>Anadara granosa</i>	High (unstable) - Management responses require repeated installation or repair of major stabilisation works
Rugged granitic hills	Moderately to steeply inclined hill crests and ridge summits with abundant granite outcrop and mantles of granitic pebbles and cobbles; soils are stony skeletal.	Low (Stable) - Resilient natural system requiring minimal maintenance
High basalt hills (Xhb)	Rugged basalt hills, strike-controlled ridges and plateau remnants with up to 110 m relief; abundant basalt rock outcrop with extensive surface mantles of basalt pebbles, cobbles and boulders with pockets of skeletal red stony clays	Low (Stable) - Resilient natural system requiring minimal maintenance

Table 2. Land Systems and Land Form (Eliot et. al., (2013)



Figure 11. Wind data for morning and afternoon at Dampier Salt, January and June (BOM, 2015)

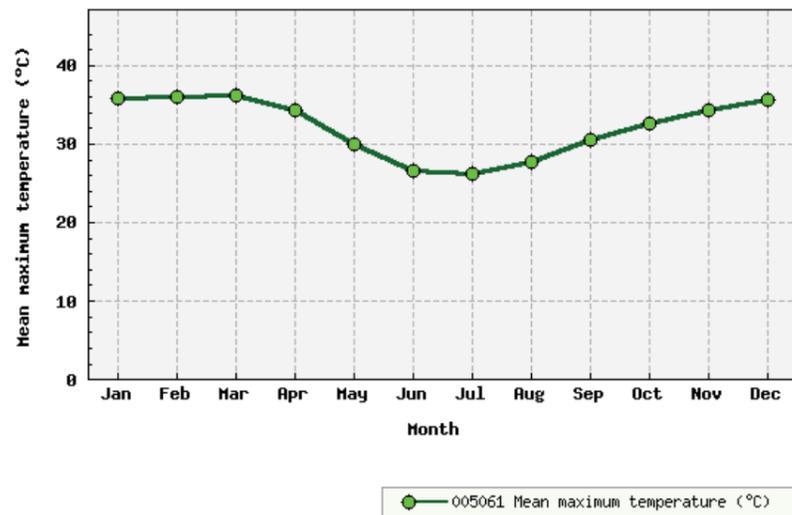


Figure 12. Mean maximum temperatures at Dampier Salt (BOM)

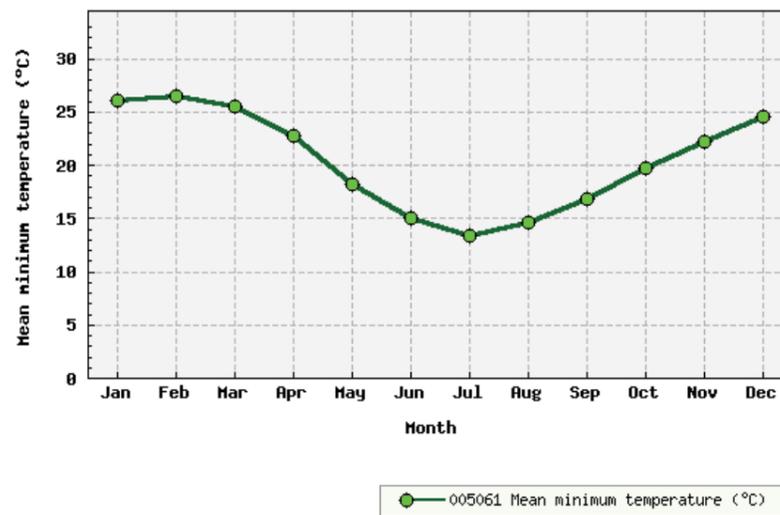


Figure 13. Mean minimum temperatures at Dampier Salt (BOM)

3.6.3 coastal processes

The coastal processes of Hearson Cove are to be considered in its context, on the east coast of the Burrup Peninsula, and also within the broader context of the Pilbara coast. This coastline is an area of extremes – of high tides and extreme weather systems (DEC, 2013).

The City of Karratha Draft Coastal Management Strategy (City of Karratha, 2015) notes the factors impacting coastal processes are as follows:

- Weather and climate;
- Waves;
- Sea level and tides; and,
- Currents.

These factors will be explored in further detail, below.

weather and climate

Hearson Cove is located at the edge of the semi-tropical Pilbara region, in Australia's arid zone. On the east coast of the Burrup Peninsula, the foreshore is sited within a unique micro-climate which provides a much cooler and more humid environment than inland Pilbara areas. As the peninsula runs from north to south, it benefits from prevailing winds throughout much of the year.

There are two distinct seasons in this area - a fine, warm winter (the dry season), from June to September and a hot summer (the wet season), from October to April or May (DEC, 2013).

The winter (dry) season is mild, the mean minimum and maximums varying from 14 to 26.3 degrees. Morning winds are from the east and south east, swinging to an afternoon westerly sea breeze (refer Figure 11).

The summer (wet) season can be extreme. The mean minimum and maximums vary from 18.2 to 36 degrees (refer Figures 12 and 13), and maximums reaching the high 40s (BOM, 2015). February and March are wettest months, with most major rainfall events associated with cyclones and summer storms. Winds are more unpredictable, squalls coming with storms and cyclonic activity (refer Figure 11). The Pilbara is one of the most cyclone prone areas in the world, with cyclones with winds of up to 250km an hour almost every year (DEC, 2013).

waves

The wave climate of the Pilbara typically follows that of the seasonal wind patterns. The Pilbara Shelf experiences a generally mild wave climate, with sea states tending to be heaviest from the northeast in the winter (dry season), peaking in June and July and lightest in late summer (wet season), April, when waves come from the west and north west (Damara, 2011).

tides, storm surge and sea level

Within the extreme landscape of the Pilbara, the seasonal weather impacts of cyclones and subsequent storm surges can result in flooding and inundation that leaves its mark in the landscape (City of Karratha, 2015).

Broadly, tides in the Dampier Archipelago, Murujuga, are semi-diurnal, meaning that there are two highs and lows each day. They have a spring-neap lunar cycle.

Tidal data for King Bay is available, however tidal data specific to Hearson Cove is not available. The King Bay tidal range is significant to the context of Hearson Cove, as extreme tidal events extend from King Bay down the gentle slope of the low lying King Bay- Hearson Cove valley, inundating the supra-tidal mudflats immediately behind the coastal dunes of Hearson Cove (Burrup Nitrates, 2010). The valley essentially acts as a floodplain, affected by high sea levels and tidal events. It has been noted that there are occasional overflows from Hearson Cove (GHD, 2010).

The mean neap tidal range at King Bay is 1.0m, where the mean spring tidal range is 3.6m. The tidal range is 5m, from 0.1 (LAT) to 5.1 (HAT), with high tide at 2.5m AHD. Storm surges raise tides even further.

Information on the tidal range and tidal events specific to Hearson Cove is not currently available. It is recommended that this report be updated in the event that it becomes available.

Storm surge is defined as the difference between predicted sea level and actual sea level, as observed. The two main causes of storm surge are wind stresses on the sea surface and atmospheric pressure, which occurs during storms and cyclones. During these extreme weather events, the sea level can become either higher or lower than predicted (Burrup Nitrates, 2010). Tsunamis, while rare, can also cause a storm surge event (Pearce, 2003).

Storm surge is most extreme and damaging when combined with high tide. It can cause significant damage along low lying areas of Pilbara coast. The Karratha Storm Surge Inundation Study suggests that storm surges exceeding 4m above AHD, i.e. 1:50 and 1:100 year events, are dominant over tidal effects (Burrup Nitrates, 2010).

Yara Pilbara Fertilisers have provided storm surge data for the Yara industrial sites immediately to the west of the Hearson Cove foreshore reserve and National Park Area. This suggests that during a 1:100 year event, the peak water level at the King Bay-Hearson Cove valley would reach 5.6m AHD. With this data in mind, it can be assumed that in a situation of storm surge at high tide (1:100 year storm), the current amenities at Hearson Cove would remain above the level of inundation. However, based on NearMap flood mapping, it can be seen that access to Hearson Cove via Hearson Cove Road becomes inundated at 4m AHD, and subsequently the foreshore area would become inaccessible.

For the purposes of this report, the information available for the nearby industrial site is used to inform the recommendations that as a guide structures are built at a ground height of 5.95 m AHD.

This recommendation is based on the available data and recognises that further detailed studies are required for the tidal context specific to Hearson Cove.

Sea level rise on a global mean basis is expected to rise between 6.7 and 20.8cm by 2040. This expected rise is to be taken in to account when advising on level of built form above AHD (Burrup Nitrates, 2010).

Highest Astronomical Tide (HAT)	5.1 m
Mean High Water Springs (MHWS)	4.5 m
Mean High Water Neaps (MHWN)	3.2 m
Mean Sea Level	2.7 m
Mean Low Water Neaps (MLWN)	2.2 m
Mean Low Water Springs (MLWS)	0.8 m
Lowest Astronomical Tide (LAT)	0.1 m

Table 3. Standard tide levels for King Bay (Pearce, 2003)

High tide	2.5 m AHD
Highest recorded storm surge (Karratha)	3.1 m AHD (Cyclone Orson, 1989)
Storm surge on high tide	5.6 m AHD (1:100 year storm)
Base height of the ground	5.5 m AHD
Office buildings	5.95 m AHD
Base of equipment (storage included)	6.1 m AHD

Table 4. Storm surge data for Yara Industrial Sites (Yara)



Figure 15. Tidal range (Instagram: @ngurranga_tours, @brooke.murphy, NearMap)



Figure 14. Tidal range and indicative land form, Section AA

3.6.4 flora and fauna

The diverse landscape of the Dampier Archipelago, Murujuga, offer a variety of marine and terrestrial landscape types and habitats supporting a range of flora and fauna. The remote and inaccessible land form of much of the peninsula provides a largely undisturbed environment for a representation of endemic Pilbara plants and animals.

On the Burrup Peninsula, the flora is varied, with a high level of species diversity. A broad scale flora survey of the Peninsula was undertaken by Trudgen in 2002, which noted that 383 native vascular plant species from 54 families as currently known from the Burrup Peninsula. No declared rare or threatened flora were included, however 33 species were listed as of conservation interest. At the time of the report, generally the vegetation was in good condition, except in areas of coastal sand – an outcome and observation significant to Hearson Cove, with areas of coastal sand.

Most of the species present on the Burrup are represented broadly throughout the Pilbara. 260 vertebrate species for at least part of the year. 32 mammals (4 introduced), 168 birds (1 introduced), and 60 reptiles and frogs can be found. There are also many migratory bird species that can be found on the Peninsula for at least part of the year (Burrup Nitrates, 2010).

At Hearson Cove, the diverse land form types provide a diverse range of habitats, which support various flora and fauna representative of the broader peninsula and archipelago, Murujuga.

As described in Part 3.5.1 // Geomorphology, Hearson Cove comprises unique land form types:

- High basalt hills;
- Rugged granitic hills;
- Mangrove flats;
- Coastal beach and dune deposits;
- Supratidal flats; and,
- Intertidal flats.

In the mangrove flats to the north of the foreshore, mangals are representative of a flora type which are characteristic of the broader peninsula. They are important feeding and breeding grounds for the terrestrial and marine fauna of Hearson's Cove, and also form an important role in coastal processes, acting as a buffer against wave action and reducing erosion and storm surge damage (WAPC, 2009).

A DPaW NatureMap report generated for the site, with a 1.5km buffer, suggests that *Avicennia marina* subsp. *Marina*, White Mangrove, or Yigara in local Yindjibarndi, Mardudhunera and Ngarluma language, is found in the Hearson Cove area – one of the two most common mangrove species found on the archipelago.

The mudflats and supratidal flats provide an important feeding ground and habitat for many species of migratory bird between Australia and South East Asia. Sand and mudflats support a rich marine invertebrate community, for example crustaceans and bivalves (Department of the Environment, 2015).

The coastal sand and dune deposits of Hearson Cove make up much of the area which characterise this foreshore. As above mentioned, it was noted at a broad scale by Trudgen (2002) that vegetation in areas of coastal sand was not in good condition.

The steeper topography and inaccessibility of the land form types High basalt hills and rugged granitic hills provides refuge for the flora and fauna typical of the peninsula. (Burrup Nitrates, 2010).

The generated DPaW NatureMap report reflects the expected diversity to be represented within the land form types present within this foreshore area. Typical genera include *Acacia*, *Euphorbia* and *Indigofera*. The complete species list can be found in Appendix 1.

In the report, the following flora species are listed under various conservation codes.

- *Stackhousia clementii* - P3 (Priority 3): Poorly-known species;
- *Terminalia supranitifolia* - P3 (Priority 3): Poorly-known species; and,
- *Rhynchosia bungarensis* - P4 (Priority 4): Rare, Near Threatened and other species in need of monitoring.

It was noted by DEC in the 2013 Management Plan undertaken for the Murujuga National Park, that of the weed species recorded on the Peninsula, Kapok bush and buffel grass are of the greatest concern, both of which appear within the subject site.

Buffel grass can reproduce either vegetatively or by seed and can be dispersed by wind, flood, fire or via animal fur. It reduces soil fertility, increases soil erosion, and releases chemicals which are toxic to other flora. It is common in areas of disturbance, for example, where off-road driving has taken place. Kapok bush also appears in conditions of disturbance.

In the instance of the subject site, the coastal beach and dune deposit area, being a disturbed landscape, is assumed to be at risk of spread of invasive species (DPaW, 2013). This is supported by the DPaW NatureMap report generated for the area of Hearson

Cove, suggesting that Kapok Bush (*Aerva javanica*) has become naturalised in the Hearson Cove area (DPaW, 2015), and further reporting by City of Karratha (2015) which suggests that Buffel Grass is present at the site.

The complete list of weeds identified on site by City of Karratha is as follows:

- Buffel grass - *Cenchrus ciliaris*;
- Kapok bush - *Aerva javanica*;
- *Acetosa vesicaria*;
- *Malvastrum americanum*;
- *Sonchus oleraceus*; and,
- *Stylosanthes hamata* (City of Karratha, 2015).

fauna

In 2010, Burrup Nitrates Pty Ltd undertook a finer scale vegetation report as a part of the Public Environmental Review for the Technical Ammonium Nitrate Production Facility site in the SIA west of the Hearson Cove foreshore area. As noted by Burrup Nitrates Pty Ltd, the following species are of conservation significance and are listed under both the WA WC act and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), and have potential to occur within the subject site, however aside from the EPBC migratory species, do not appear in the generated NatureMap report.

- Olive python (Pilbara subspecies) - Vulnerable (PPBC), critically endangered fauna (CR)WC Act;
- Northern quoll - Endangered (EPBC);
- Pilbara leaf-nosed bat (Pilbara form) - Vulnerable (EPBC), critically endangered fauna (CR)WC Act; and,
- EPBC Listed Migratory Species (including CAMBA, JAMBA and ROKAMBA).

The NatureMap report generated for Hearson Cove suggests that the following threatened fauna are present within the subject site.

- *Pluvialis squatarola* (Grey Plover) – migratory bird - IA (Listed under international agreement): JAMBA;
- *Numenius phaeopus* (Whimbrel) – migratory bird IA - (Listed under international agreement): JAMBA;
- *Limosa lapponica* (Bar-tailed Godwit) – migratory bird IA - (Listed under international agreement): JAMBA; and,
- *Charadrius mongolus* (Lesser Sand Plover) – migratory bird - T: (Rare or likely to become extinct).

3.7 social - uses, values and perceptions

Hearson Cove is of great social value to the residents of the City of Karratha, and to tourists to the area. It is one of the most popular beaches in the City and Dampier, Karratha, Roebourne, Wickham, Point Samson are all within close range of the Archipelago. As one of the most accessible stretches of coastline on the archipelago, Hearson Cove plays an important role in providing access to this spectacular landscape (City of Karratha FMS).

At high tide, Hearson Cove offers one of the best swimming beaches in the area. The rocky headlands to the north and south of create a natural amphitheatre whilst leaving a clear, shell beach largely uninterrupted by rocky ground. At low tide, the bay offers an expansive landscape for a different range of activities, including the popular 'Staircase to the Moon.'

This area is popular both for locals and for tourists. Data from 2007 suggests that the Karratha visitors centre receives 70,000 visitors a year, peak season being May to September. The Woodside Visitor centre on the Peninsula receives 30,000 visitors a year, and it is estimated that up to 3,000 visit the more remote, less accessible areas of the Northern Burrup in Murujuga National Park, per year (DPaW, 2013).

To demonstrate the popularity of Hearson Cove specifically, vehicle flow data is included in Figure 24, which was recorded by the Department of Parks and Wildlife for the month of October, 2013. There are caveats around this information, as it's only a single snapshot of one month of data. However, the data shows that 5031 vehicles were recorded along Hearson Cove Road (single direction) between 5pm Wednesday, 2nd of October to 1:30pm Wednesday the 6th of November, 2013. The graph shows spikes in popularity during the weekends and a small event held on the 20th of October, 2013 when just fewer than 250 cars were recorded.

The most popular activities at the foreshore area, noted through community workshops, one-on-ones and through the City of Karratha online survey, have been stated as:

- Swimming
- Kite surfing;
- Snorkelling;
- Fishing;
- Picnicking and BBQs;
- Events, including 'Staircase to the Moon,' and more formal concerts;
- Appreciation of natural landscape, flora and fauna;
- Appreciation of cultural landscape, including rock art;
- Use of powered water craft;
- Care for and maintenance of the landscape by Murujuga Rangers; and,
- Recreation with domestic animals, such as dogs and horses.

Additionally to the above, Hearson Cove is significant as a cultural site. Many of the uses as listed above are related to an ongoing connection to and care for this Country.

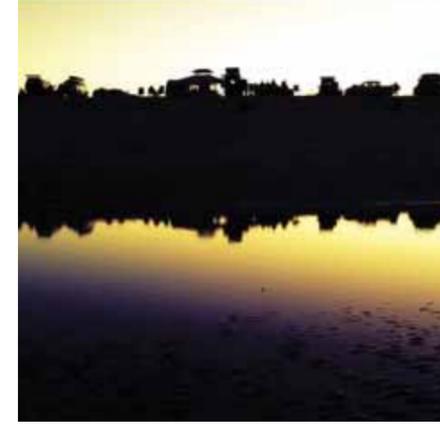
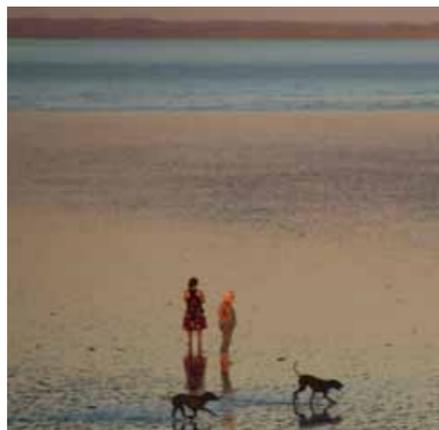
For the purposes of gathering background data on the community use of Hearson Cove Foreshore for this FMP, 91 people responded to an online survey, 96% of whom live in the City of Karratha (refer Figure 16). Of the City of Karratha locals who responded, the majority live in Karratha (77%) (refer Figure 17).

The survey supports the assertion that Hearson Cove is a popular beach for locals of the City of Karratha. Two thirds of the people surveyed visit Hearson Cove once a month or more (refer Figure 18), staying for 1 to 3 hours (refer Figure 23), the most popular times of day being weekend mornings and high tide (refer Figure 22).

The most popular activities noted are swimming, BBQs / picnicking, nature appreciation and 'Staircase to the Moon,' a natural phenomenon occurring when the full moon reflects on exposed mudflats at extremely low tide (refer Figure 21). Respondents also noted that Hearson Cove was an important place for kite surfing and spending time with domestic animals. When questioned on values at Hearson Cove, respondents noted that leisure activities were of the highest value (49%), followed by nature appreciation (26%) (refer Figure 26). 81% of people surveyed stated that amenity was an important issue to address at the foreshore (refer Figure 19).

Hearson Cove is within close proximity to the site of the proposed Murujuga Living Knowledge Centre, an information and cultural learning hub. Beyond the Living Knowledge Centre, also on Hearson Cove Road, is Deep Gorge, a site of with great cultural significance and with associated management opportunities and challenges.

The additional planned land usage of the Murujuga Living Knowledge Centre will consolidate Hearson Cove and the surrounding area as a tourism hub and as the gateway to Murujuga National Park, and is forecast to increase visitor numbers to the area. It is imperative that a strong and robust management plan is in place which acknowledges both present and future use of this foreshore area.



Images . Supping (Instagram, @katedaugh), Time with Pets (Ken Mulvaney), Fishing (Instagram, @d_nev05), Time with pets (Instagram, @mickbar82), Stairway to the Moon (Instagram, @mynameisjosim, 4WD Access @clariesanne95).

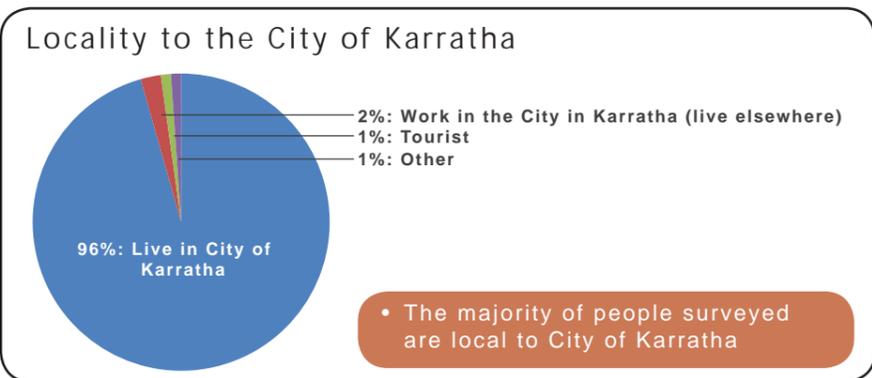


Figure 16. City of Karratha online survey, locality to the City of Karratha

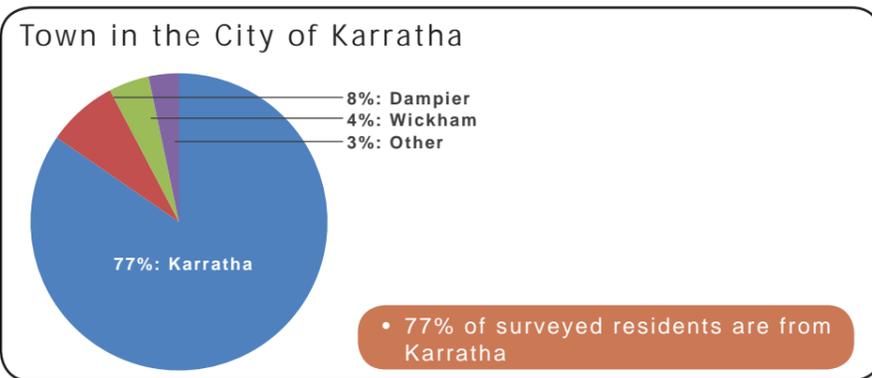


Figure 17. City of Karratha online survey, town in the City of Karratha

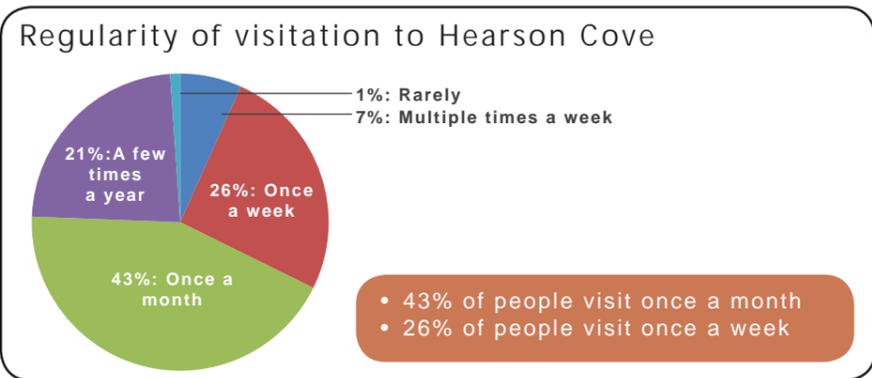


Figure 18. City of Karratha online survey, regularity of visitation to Hearson Cove

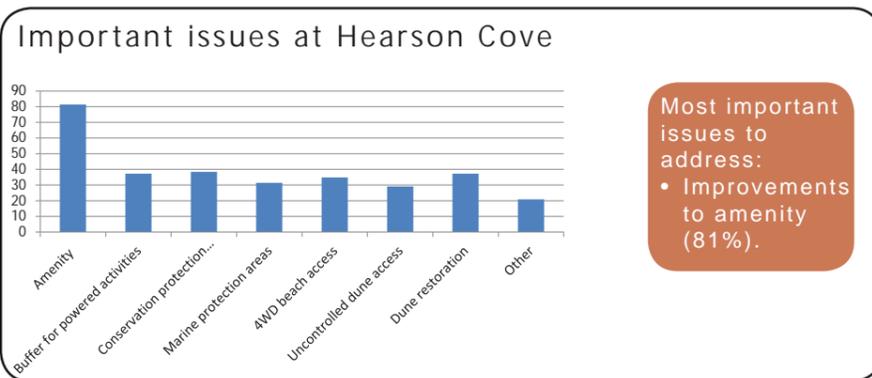


Figure 19. City of Karratha online survey, important issues at Hearson Cove

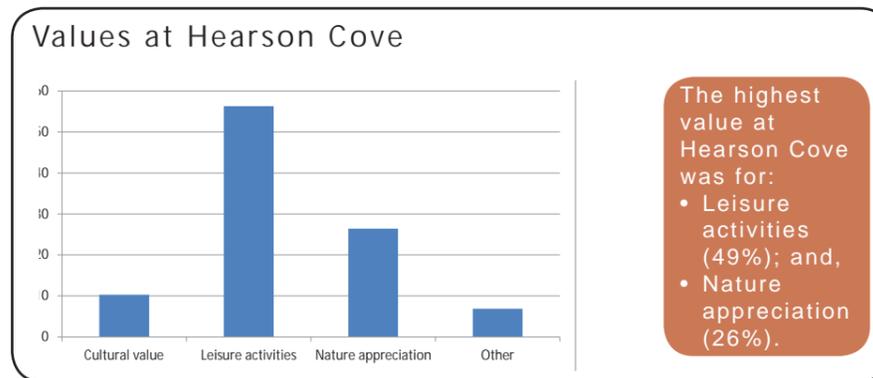


Figure 20. City of Karratha online survey, values at Hearson Cove

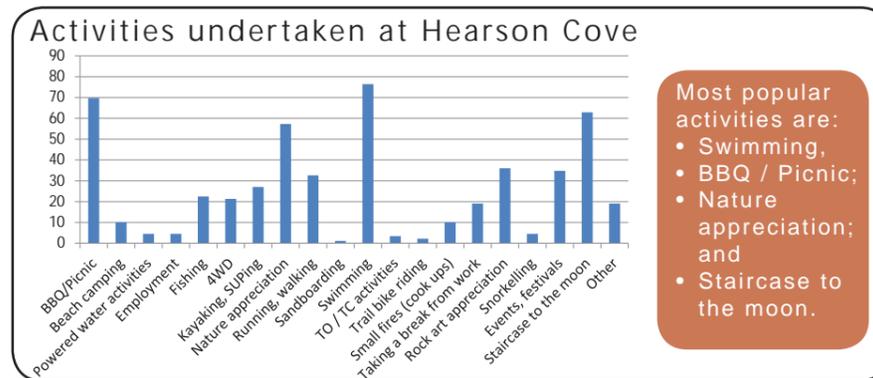


Figure 21. City of Karratha online survey, activities at Hearson Cove

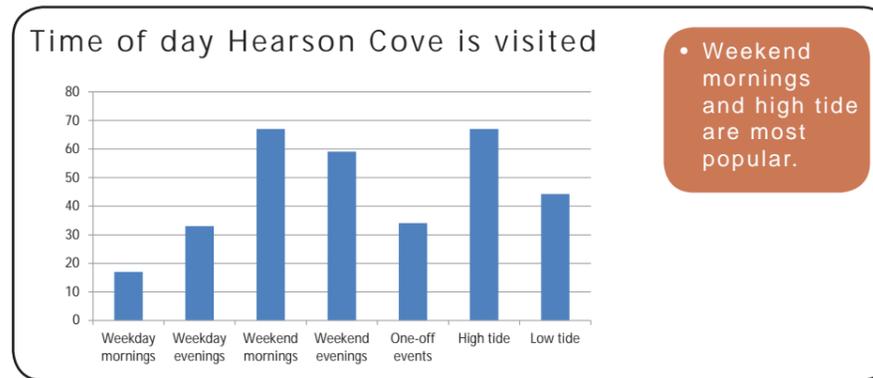


Figure 22. City of Karratha online survey, time of day Hearson Cove is visited

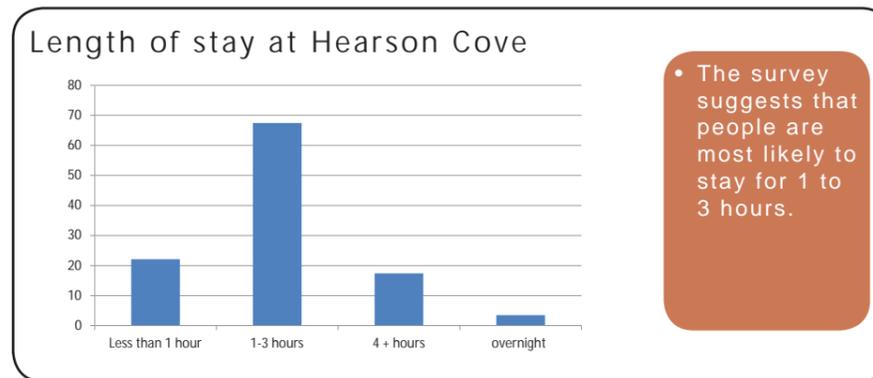


Figure 23. City of Karratha online survey, length of stay at Hearson Cove

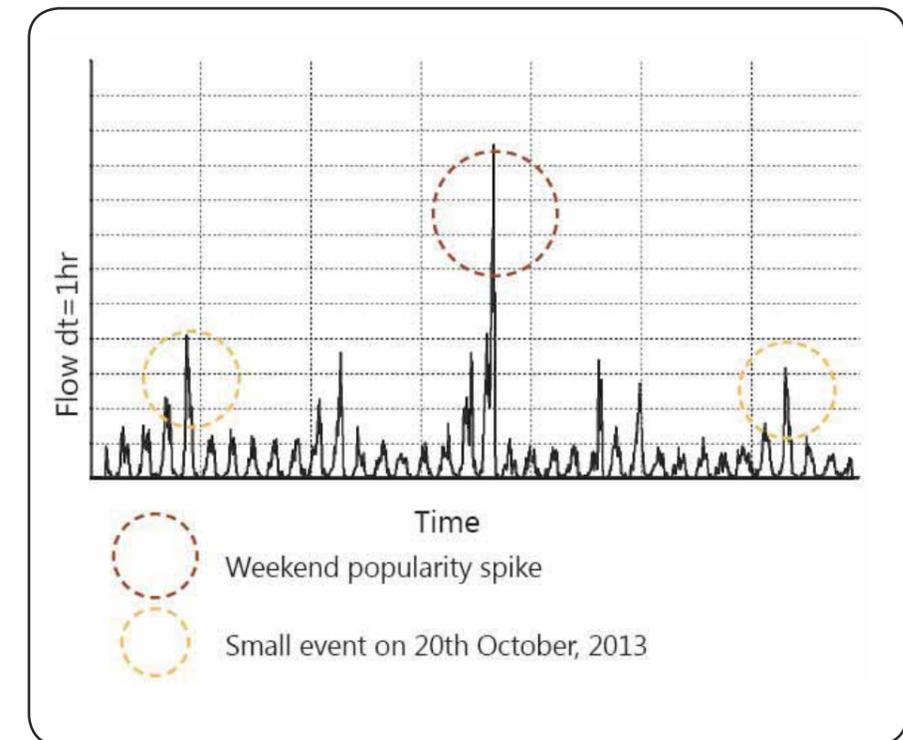


Figure 24. City of Karratha online survey, length of stay at Hearson Cove

4.1 key themes

From the community and stakeholder engagement process six (6) key themes arose directly related to the management of the Hearson Cove Foreshore.

The key themes are as follows:

1. AMENITY // Upgrades to the existing, low-key amenity;
2. ACCESS // Continued controlled access to the beach, with respect to current condition and rising tourist numbers;
3. PROTECTION // Protection of vulnerable cultural and ecological areas;
4. GOVERNANCE // Shared governance which involves and reflects the values of community and stakeholders;
5. EDUCATION // Education and awareness about social, environmental and cultural values, and associated uses; and,
6. RISK MANAGEMENT // Risk management with respect to large events and adjacent industry.

A site level S.W.O.T. (Strengths, weaknesses, opportunities and threats) analysis has been undertaken for each key theme, which provides the background for the development of Part 5 // Management Plan and Management Actions.

Strengths and weakness are an analysis of the current condition while opportunities and threats consider elements that may have impact for the future.



Image. View across the Hearson Cove-King Bay Valley to Hearson Cove (UDLA)

Theme 1: AMENITY // Upgrades to existing, low-key amenity

S.W.O.T. analysis

STRENGTHS

- Minimal yet well used amenity provided by the City of Karratha, focused around a southern amenity hub, including:
 - Shelters with shaded seating areas;
 - Wood fired BBQs;
 - Toilets; and,
 - Easy vehicle access to the beach which includes informal parking;
- A landscape which provides a natural amphitheatre, popular for events and gatherings attracting community members City wide, as well as tourists;
- Informal boat launch to the north of the foreshore area, outside the DoT prescribed area for non-powered vessels only;
- The landscape setting provides a natural outlook towards the east, without views of industry, which is unique to the peninsula.
- The foreshore area provides a clear swimming beach; and,
- Amenity is accessible to all, with both 4WD and 2WD access.

WEAKNESSES

- Provided amenity (e.g. toilets, shelters, picnic tables) are ageing and in need of upgrade;
- Provided amenity does not reflect the character and significance of Hearson Cove as a major and growing tourist and event destination;
- Lack of surveillance can lead to vandalism, etc;
- Wood fired BBQs have been provided, which encourage collection of firewood from surrounding areas, causing a risk to vulnerable ecological communities; and,
- The most popular time at Hearson Cove is during the hours a high tide, when the foreshore area is crowded with a few hours of activity.

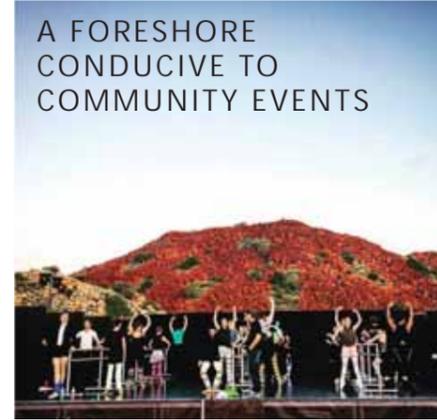
THREATS

- Extreme environmental conditions. Any provision of formalised amenity should be implemented with regard to forecast storm surge risks, sea level rise and Pilbara weather conditions. As noted in Part 3.5.3, Coastal Processes, it is recommended that built form is at 5.95 m AHD and above; and,
- Future industrial development which is not aligned with protection of the current amenity provision at the foreshore (impeding on visual and aural amenity at the foreshore).

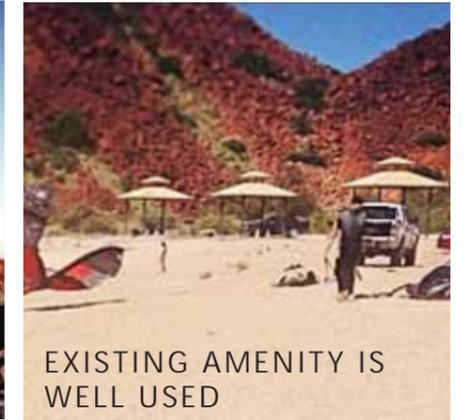
OPPORTUNITIES (RECOMMENDATIONS / MANAGEMENT ACTIONS)

- Provision of low key, low maintenance amenity at the existing southern amenity hub;
- Formalise 4WD and 2WD access;
- Formalise pedestrian access;
- Provide options for activities that can be enjoyed at both high and low tide;
- Work with current management plans and strategies of neighbouring operators (both Murujuga Aboriginal Corporation and industry) to increase amenity at the foreshore area; and,
- Increase surveillance of the foreshore.

STRENGTHS



A FORESHORE CONDUCTIVE TO COMMUNITY EVENTS



EXISTING AMENITY IS WELL USED

WEAKNESSES



EXISTING AMENITY IS IN NEED OF REPLACEMENT



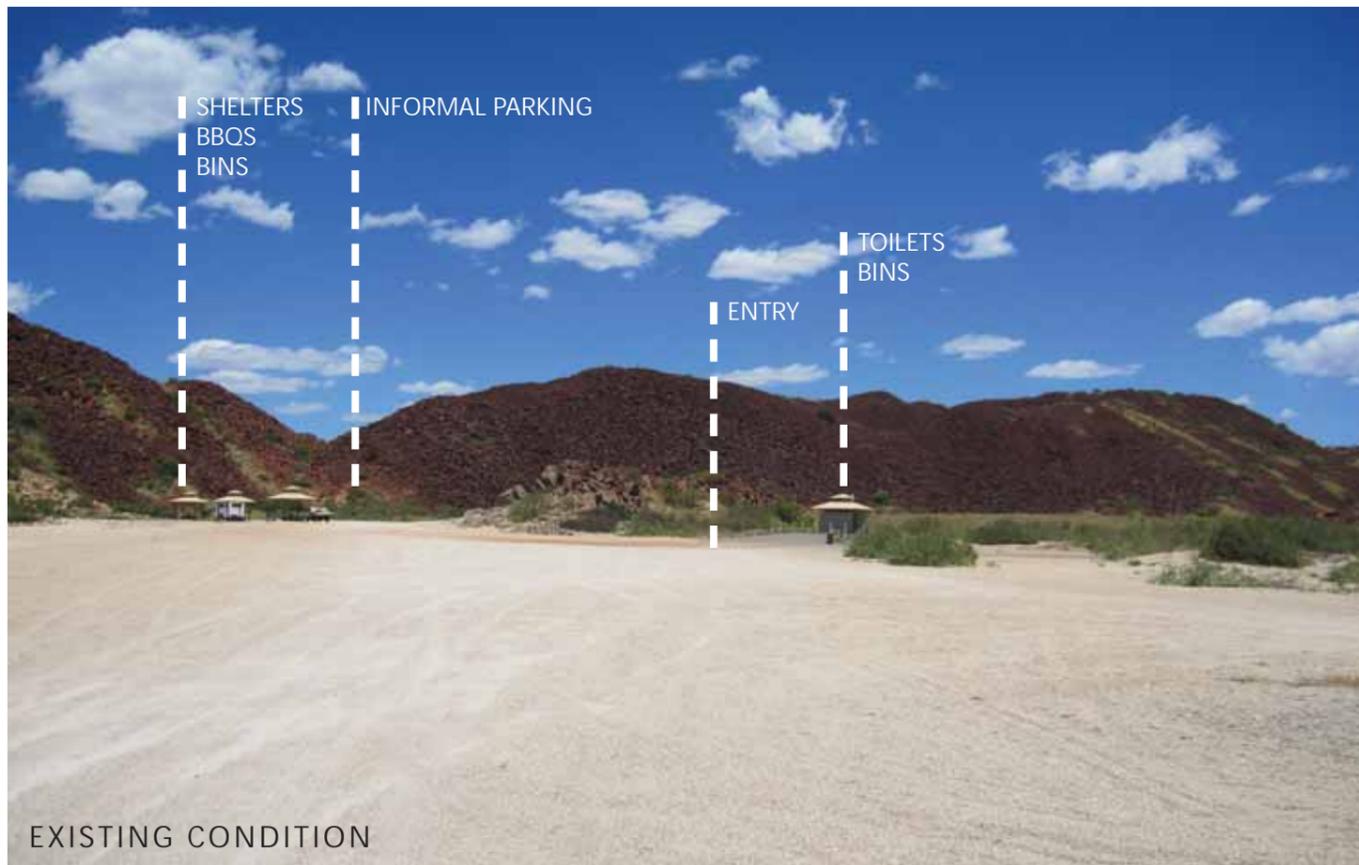
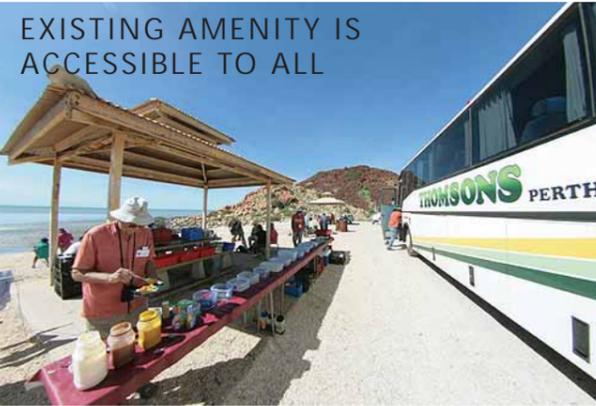
OPPORTUNITIES



SHELTERS AND SEATING (4 MILE CREEK, ONSLOW)

Images. Ballet at Hearson Cove (Instagram: @clordsole), Kite surfing (Instagram: @drift-ergirl), Bus tour (FARA), Open BBQ (Instagram: @tiashastokes), Beach shelter (Instagram: @greetingtheworld), Shelters and toilets (UDLA), Open seating and BBQs (trathlono), Car access and shelters (Triathlono), Shelters and seating at 4 Mile Creek, Onslow (joshbyrne.com.au), Event Parking (UDLA).

Refer Part 5 for targeted Management Actions / Recommendations



Theme 2: ACCESS // Continued controlled access to the beach, with respect to current condition and rising tourist numbers

S.W.O.T. analysis

Access and freedom are central aspects to the enjoyment and use of the Hearson Cove Foreshore. It is one of the most accessible beaches in the area, which makes it desirable for both locals and tourists.

STRENGTHS

The strengths of the current access model at the Hearson Cove Foreshore are as follows:

- A model of access which allows community freedom and self moderation;
- Ability to access the waterfront in 4WDs, allowing access for all ages and abilities; and,
- 2WD access via sealed road with informal parking provision.

WEAKNESSES

Hearson Cove is a popular location, and with much use and uncontrolled access come management issues. Issues arising from the current ease of access are as follows:

- Ad-hoc access to dune and supratidal flat area by vehicles (including 4WDs, quad bikes and trail bikes access) and pedestrians causing aggravated erosion and causing destabilisation of the foredune;
- Spread of invasive weed species;
- Widespread access of the site is also connected to the leaving of litter and rubbish across the foreshore area;
- Vehicle access leading to increased risk to wildlife;
- Short term camping in the foredune area;
- Lighting of fires, including the use of native vegetation for firewood;
- During popular events, traffic management is an issue with the current allowance at capacity and a need for future proofing.
- Sealed road has lead to increasing speeds along the entry to Hearson Cove, along Hearson Cove road causing a risk to wildlife;

- In a 1:100 year storm event, the Hearson Cove access road floods at 4m according to indicative NearMap flood modelling; and,
- Widespread access and lack of surveillance leading to vandalism, including graffiti on rocks near the beach

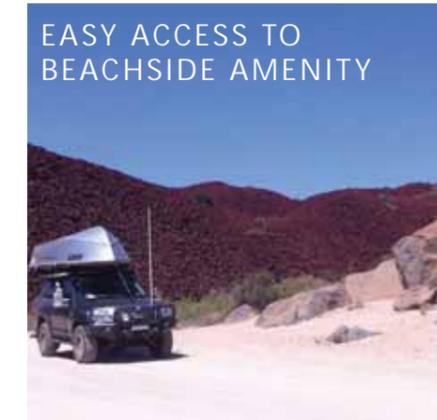
THREATS

- Extreme environmental conditions. Any provision of formalised access should be implemented with regard to forecast storm surge risks and Pilbara weather conditions, and should be above the high tide mark.

OPPORTUNITIES (RECOMMENDATIONS / MANAGEMENT ACTIONS)

- Formalise 4WD and 2WD access;
- Formalise pedestrian access;
- Protect vulnerable dune areas;
- Future proof for increased visitor numbers;
- Increase education around access of the foreshore; and,
- Increase surveillance of the foreshore.

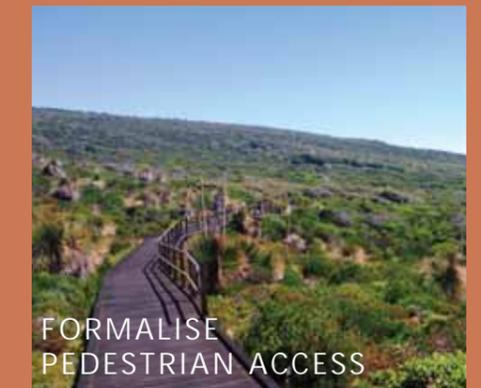
STRENGTHS



WEAKNESSES



OPPORTUNITIES



Images. 4WDs at the foreshore (Instagram: @360degreewellness), Litter (Pilbara Ports Authority), Campfire (Instagram: @360degreewellness), Vandalism (Pilbara Ports Authority), Dune protection (UDLA), Formalised pedestrian access.

Refer Part 5 for targeted Management Actions / Recommendations

Theme 3: PROTECTION // Protection of vulnerable ecological and cultural areas

S.W.O.T. analysis

STRENGTHS

- The Hearson Cove Foreshore is an area of both cultural and ecological significance;
- City of Karratha Rangers undertake early morning patrols during the tourist high season / camping season (the dry season), and are able to install covert cameras to monitor visitor behaviour;
- The Hearson Cove foreshore area is adjacent to the Murujuga National Park, a protected conservation area;
- The Murujuga Land and Sea Unit (the Murujuga Rangers) are continuously working to map the cultural heritage and ecological significance of the area. One of the current roles of MLSU, with guidance from the CoE, is working toward the mapping of all relevant cultural heritage sites on the Dampier Archipelago, Murujuga. This includes Hearson Cove. Murujuga Rangers also undertake a number of programs to protect vulnerable ecological communities in the broader area; and,
- Murujuga Rangers patrol Hearson Cove multiple times a week, and contribute to visitor education about the broader area as well as surveillance of the foreshore area.

WEAKNESSES

- Uncontrolled grass fires from open fire pits/BBQ;
- Ad-hoc 4WD, 2WD and pedestrian access threatening vulnerable ecological and cultural areas (See Theme 2: Access);
- Currently the only publicly available data for the site and surrounds is for Department of Aboriginal Affairs (DAA) sites, which is not adequate to map and therefore protect the Aboriginal cultural significance of this place;
- Archaeological surveys on the peninsula, undertaken since the 1960s, have largely been prompted by industrial development with varying levels of input from Traditional Custodians, and for this reason these cannot be relied upon to communicate the full extent of significance of sites on Murujuga (DPaW, 2013); and,
- Along similar lines, Registered Aboriginal Heritage Sites with the Department of Aboriginal Affairs (DAA) under the Aboriginal Heritage Act have been registered in and around Hearson Cove

(Department of Aboriginal Affairs). There are a number of issues involved with the mapping of the DAA sites especially relating to accuracy, usability and access. This report acknowledges that this representation is static, and doesn't reflect the integrated and living culture associated in with Aboriginal Heritage Sites, including the landscape of Murujuga.

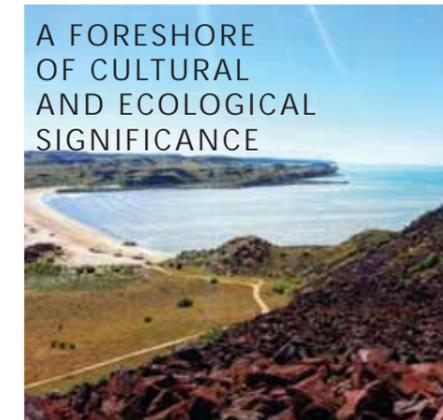
THREATS

- Continued uncontrolled access leading to further degradation of the foredune (See Theme 2: Access);
- A lack of education and communication on about the ecological and cultural significance of this site (See Theme 3: Education);
- The hind dune system is heavily degraded and infested with weeds. Disturbance of these areas could result in widespread weed infestations. Ruby Dock (*Acetosa vesicaria*) is particularly insidious.

OPPORTUNITIES (RECOMMENDATIONS)

- Build upon existing strong community and Traditional Custodian initiatives and continue to build these partnerships, to highlight and protect cultural and ecological values unique to Hearson Cove, and unique sites of international significance;
- Formalise 4WD and 2WD access;
- Formalise pedestrian access;
- Protect and revegetate vulnerable dune areas;
- Determine the presence of *Priority and Threatened Ecological Communities* through ecological surveys;
- Undertake weed surveying of the area to determine presence of high risk environmental weeds, with the implementation of associated weed eradication programs; and,
- Ensure that disturbance of dune areas during infrastructure development is undertaken with correct weed management measures.

STRENGTHS



WEAKNESSES



Images. 4WDs at the foreshore (Instagram: @MRJ89), Litter (Instagram: @lookleftphoto), Campfire (Instagram: @money_penny_).

Refer Part 5 for targeted Management Actions / Recommendations

Theme 4: EDUCATION // Education and awareness about environmental, social and cultural values, and associated uses

S.W.O.T. analysis

STRENGTHS

- Strong community and stakeholder initiatives have led to education and awareness programs at the Hearson Cove foreshore. For example, the Murujuga Rangers are active on the foreshore daily, working towards community and visitor education about the broader area, and Karratha community groups undertake 'clean up' programs at the site;
- In the broader area, communication on cultural sites and guidelines on visitor behaviour are communicated through a range of Murujuga National Park signage;
- It has been noted that self moderation and communication about regulations takes place amongst community members using this foreshore amenity; and,
- A foreshore with a strong and diverse history European and Aboriginal history, as well as current diverse cultural values.

WEAKNESSES

- Clear guidelines for visitor behaviour at Hearson Cove are not outlined in one, singular, clear form of signage. Signage should be in line with City of Karratha signage standards, and should be complimentary to Murujuga National Park signage;
- Guidelines for the Hearson Cove Reserve differ from guidelines for the adjacent Murujuga National Park, for example, domestic animals are permitted in the Hearson Cove Reserve however are not permitted at Murujuga National Park. This is the cause of some visitor confusion and can make it difficult to 'do the right thing.';
- Information regarding DoT guidelines on powered and non-powered vessels and their use is not clearly delineated;
- The identity of the Hearson Cove Foreshore as separate from the Murujuga National Park is not clearly communicated, as such the foreshore does not have a clear identity; and,
- Information about the cultural, environmental and industrial layers at the site are not currently communicated for visitor interpretation.

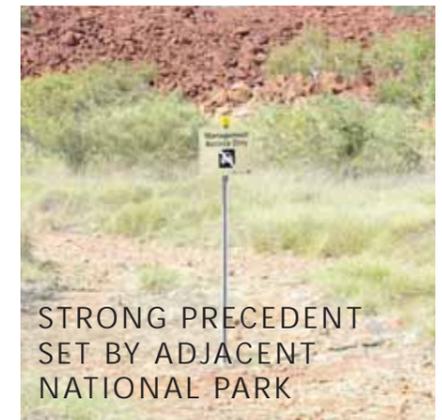
THREATS

- An unclear message on the appropriate way to behave at the Hearson Cove Foreshore.

OPPORTUNITIES (RECOMMENDATIONS / MANAGEMENT ACTIONS)

- Consolidation of one Foreshore Area identity on uniform signage which clearly guides visitor use;
- Consolidation of one Foreshore Area identity on uniform signage which clearly encourages interpretation of cultural, environmental and industrial elements of the site;
- Consolidation of one Foreshore Area identity on uniform signage which interprets both the European and Aboriginal history of the site;
- Develop area respect through borrowing the signage language of the adjacent national park; and,
- Build upon existing strong community and Traditional Custodian initiatives.

STRENGTHS



OPPORTUNITIES



Images. Murujuga National Park (DPaW), Signage (UDLA), Signage (UDLA), Karajini National Park (DPaW), Uluru (standingonsacredground.org), Uluru Kata Tjuta National Park

Refer Part 5 for targeted Management Actions / Recommendations

Theme 5: GOVERNANCE // Shared governance which involves and reflects the values of community and stakeholders

S.W.O.T. analysis

STRENGTHS

- The Hearson Cove Foreshore is rich in significance to a wide variety of City of Karratha community members, as well as being an important tourism asset;
- At present, the Hearson Cove Foreshore is cared for by the City of Karratha as well as strong and committed stakeholder and community groups, including the Murujuga Ranger team;
- A shared governance strategy is in development - City of Karratha is currently working with Murujuga Aboriginal Corporation toward a shared management agreement, as well as working together with the Murujuga Parks Council on management of the Hearson Cove Foreshore area; and,
- City of Karratha currently consults and aligns with the Murujuga National Park Management Plan (2013) when devising actions for the area.

WEAKNESSES

- Various management bodies operate and control intersecting land.

THREATS

- Lack of communication between City of Karratha, community and stakeholders.

OPPORTUNITIES (RECOMMENDATIONS)

- Continue to work towards development of partnership or agreement between City of Karratha and Traditional Custodians to maximise the benefit and value of the Murujuga Rangers' time spent at Hearson Cove;
- Continue to work towards the development of an agreement between City of Karratha and Traditional Custodians regarding shared governance and management of this foreshore area;
- Opportunity for City of Karratha to continue to align with the Murujuga National Park Management Plan and, where appropriate, align with the future Murujuga Cultural Management Plan, currently being developed;
- Opportunities for increased surveillance through greater communication with the other management bodies in the area, eg the future Murujuga Living Knowledge Centre; and,
- Build on the strong communication model initiated through further development of the Hearson Cove Stakeholder Reference Group through the development of an ongoing reference group (refer Figure 25)

STRENGTHS



Images. Graffiti clean up by the Karratha community (Pilbara Ports), Murujuga Ranger presence at Hearson Cove (UDLA).

Proposed governance model



The proposed governance model for Hearson Cove will build upon the strong communication model initiated by the development of this Foreshore Management Plan, through the initiation of the Hearson Cove Stakeholder Reference Group.

It is recommended that the this model is retained, adjusted and built upon, with meetings called on an 'as needs' basis to discuss management goals for Hearson Cove that are shared by the City of Karratha, industry, Murujuga Aboriginal Corporation, government departments and various community groups.

These meetings will also allow the fine tuning of day-to-day goals around shared surveillance, on-the-ground management, and community involvement on site.

It is also suggested that, as they become available, the various strategies and management plans of adjacent industry and the Murujuga National Park are referred to and integrated in to management strategies for this foreshore area, to maintain a shared direction for Hearson Cove.

Figure 25. Proposed governance model

Refer Part 5 for targeted Management Actions / Recommendations

Theme 6: RISK MANAGEMENT // Risk management with respect to events, adjacent industry, and peak times at the foreshore

S.W.O.T. analysis

STRENGTHS

- The Hearson Cove Foreshore is well sited, within proximity of tourism and industrial hubs attracting cultural, environmental and industrial visitors; and,
- The nature of Hearson Cove lends itself to organic community events, such as 'Staircase to the Moon,' consisting of community members gathering for a common reason.

WEAKNESSES

- As stated in Part 3.5.3, Coastal Processes, and according to initial NearMap modelling, Hearson Cove Road floods at 4m;
- During large social events at the foreshore, there is a requirement for an emergency evacuation and response plan for this foreshore area;
- Difficulties with traffic management during peak times; and,
- Hearson Cove Foreshore is in close proximity to many industrial sites

THREATS

- Continued rise in popularity of the foreshore area without future proofing the site;
- Risks posed by future industrial development; and,
- Risks posed by extreme coastal conditions.

OPPORTUNITIES (RECOMMENDATIONS)

- It is recommended that large scale, staged events at Hearson Cove be kept to a minimum and for the most part, undertaken by experienced external operators. In the event that large scale events are undertaken, an Event Management Plan is to be prepared and approved at the local authority's discretion;
- Emergency Response Plans are also to be prepared on an event by event basis at the discretion of the local authority;
- The plan recommends a Traffic Management Plan to be undertaken that details required traffic monitoring, traffic calming along Hearson Cove road, including overflow parking;
- In the event that further development is undertaken at Hearson Cove Foreshore, a detailed Coastal Vulnerability study is to be undertaken; and,
- In the event that further development is undertaken at Hearson Cove Foreshore, a detailed study of Industrial Buffer zones and their implications is to be undertaken.



Image . Waiting for 'Stairway to the Moon' (Ken Mulvaney)



Image . Murujuga National Park Opening at Hearson Cove (UDLA)

4.2 strengths

As shown in the previous pages' analysis, the Hearson Cove foreshore has many strengths.

Access and freedom are central aspects to the enjoyment and use of the Hearson Cove Foreshore. It is one of the most accessible beaches in the area, which makes it desirable for both locals and tourists. The natural landscape setting and outlook is another major strength of this foreshore area, as is the existing, well used amenity - both a strength and a weakness in this case, as it is well used amenity which requires an upgrade. The close proximity to other significant sites on the Peninsula, such as Deep Gorge, the proposed Murujuga Living Knowledge Centre, the Murujuga National Park, and the North West Shelf Visitors Centre, are also strengths.

Figures 26 and 27 summarise the main strengths of the existing condition of the Hearson Cove foreshore.

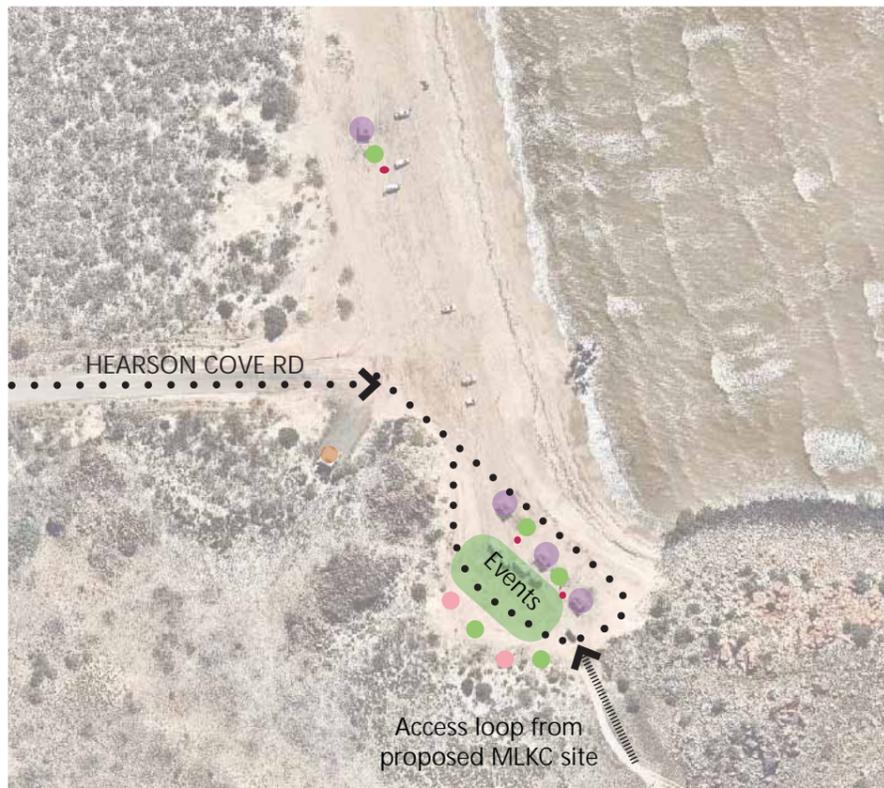


Figure 26. Southern amenity node - Scale: 1:2,500 at A3

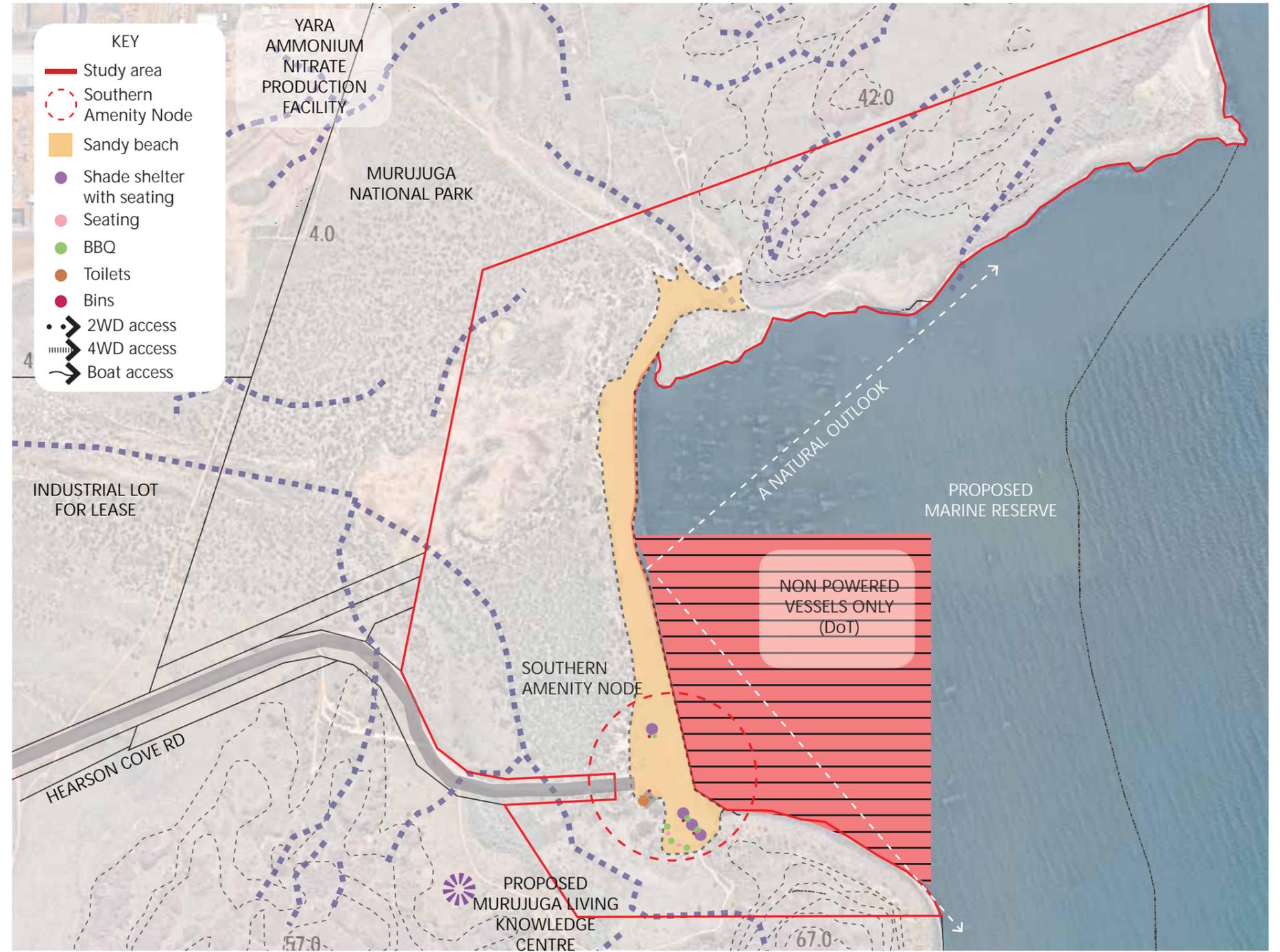


Figure 27. Strengths - Scale: 1:7,500 at A3

4.3 weaknesses

Along with strengths, the Hearson Cove Foreshore has weaknesses. In summary, from the previous pages' analysis, it can be ascertained that a lack of education and shared governance at the foreshore are current weaknesses, as is a lack of clear communication on visitor guidelines and subsequent identity for the Hearson Cove Foreshore Reserve as distinct from the adjacent Murujuga National Park.

Other weaknesses, as mapped in Figure 28, are storm surge risks (indicative NearMap flood mapping included only), amenity, which is in need of improvements, uncontrolled pedestrian and vehicle access through the dunes causing damage to ecological and culturally sensitive sites, and a need for increased surveillance of the foreshore area.

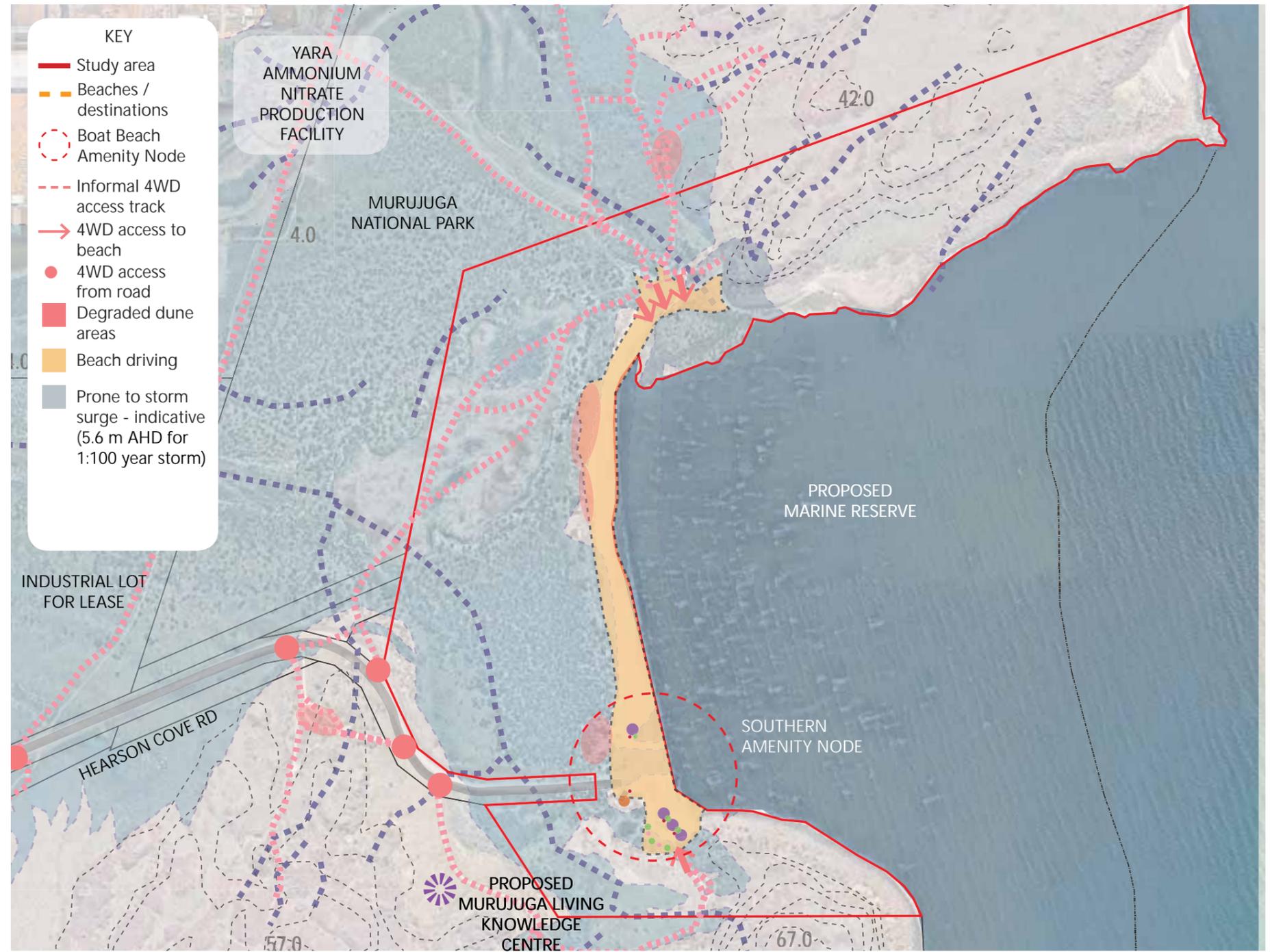


Figure 28. Weaknesses - Scale: 1:7,500 at A3

5.1 management strategy

The Hearson Cove Foreshore Management strategy was derived from extensive background research and stakeholder and community engagement.

The management plan, and associated actions / recommendations, have been developed from the themes noted in Part 4 // Key Themes, and as listed below, and responds to the Strengths, Weaknesses Opportunities and Threats identified within the subject site.

1. AMENITY // Upgrades to the existing, low-key amenity;
2. ACCESS // Continued controlled access to the beach, with respect to current condition and rising tourist numbers;
3. PROTECTION // Protection of vulnerable cultural and ecological areas;
4. GOVERNANCE // Shared governance which involves and reflects the values of community and stakeholders;
5. EDUCATION // Education and awareness about social, environmental and cultural values, and associated uses; and,
6. RISK MANAGEMENT // Risk management with respect to large events and adjacent industry.

This management plan ensures that the current hard work and engagement of stakeholders and community at Hearson Cove will ensure the long term sustainability of this foreshore area as it continues to grow in popularity.



Image. Hearson Cove, looking south (UDLA).

5.2 management plan

This management plan ensures that the current hard work and engagement of the community at the Hearson Cove foreshore area will be acknowledged and built upon to ensure the long term sustainability of this important tourism and community hub, while also allow the popularity of this foreshore area to grow.

The high level, overarching concept plan adjacent indicates opportunities discussed by stakeholders and the community for 'low-key' enhancement of existing amenity, as well as protection of ecological and cultural areas.

A key feature is the communication of the areas beyond the beach as Murujuga National Park. This will aid in communication of clear guidelines to visitors, in a partnership between City of Karratha Rangers, who currently have delegated authority in this area, and Murujuga Rangers, who currently have delegated authority in Murujuga National Park and also patrol Hearson Cove as a part of their time caring for Murujuga, broadly.

Key features of the Management Plan include:

1. Improvements to existing southern amenity node (Refer Figure 29);
2. Retention of informal parking / overtaking areas to be controlled through adequate fencing at the rear and extent of degradation;
3. Possibility of addition of walking trail to connect with future Murujuga Living Knowledge Centre with inclusion of cultural safety warnings and other cultural elements as appropriate on 4WD track to the south. 4WD track to be closed once trail is provided. Possibility to include ecological, cultural, historical (European and Aboriginal) and industrial interpretation;
4. Formalised, 4WD access on a singular track to the north, Ranger access only on other access ways;
5. Ranger access only on 4WD track to the south;
6. Department of Transport powered vessel exclusion zone; and,
7. Informal parking / overtaking areas to be retained.

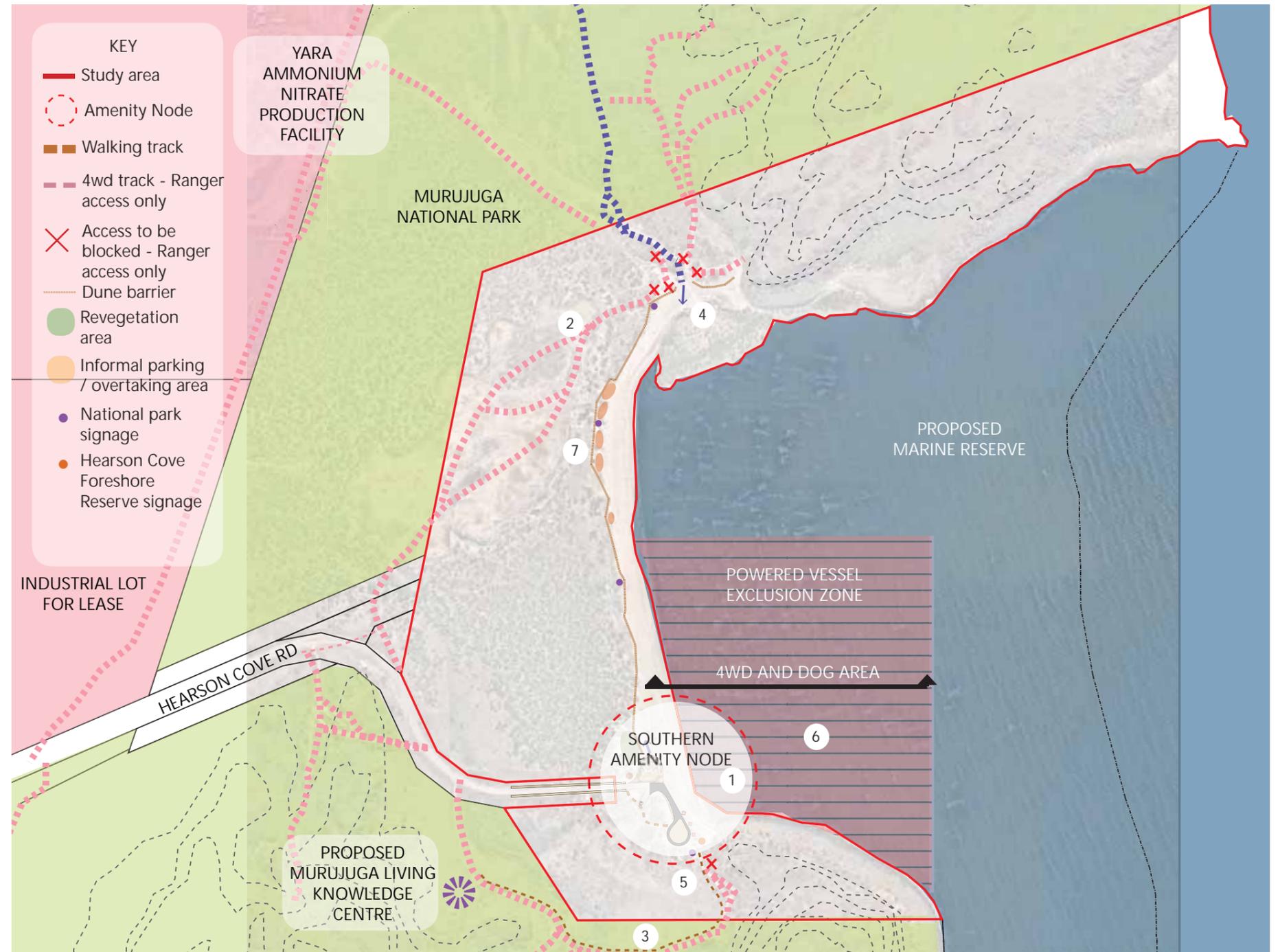
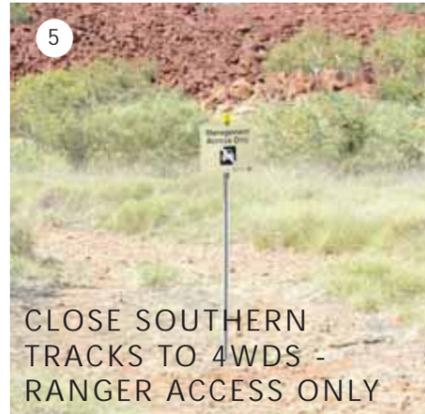


Figure 29. Management plan - Scale: 1:7,500 at A3

INDICATIVE REVEGETATION SPECIES LIST

Abutilon fraseri	Indigofera linifolia
Acacia arida	Indigofera monophylla
Acacia bivenosa	Ipomoea costata (Rock Morning Glory, Kanti)
Acacia coriacea subsp. coriacea	Jasminum didymum subsp. lineare (Desert Jasmine)
Acacia gregorii (Gregory's Wattle)	Lepidium pedicellsum
Adriana tomentosa	Myoporum montanum (Native Myrtle)
Amaranthus undulatus	Neobassia astrocarpa
Avicennia marina subsp. marina	Paspalidium tabulatum
Bonamia media	Pittosporum phillyreoides (Weeping Pittosporum, Yaliti)
Brachychiton acuminatus	Ptilotus villosiflorus
Cassytha capillaris	Rhagodia preissii subsp. obovata
Capparis spinosa var. nummularia (Coastal Caper)	Rhynchosia bungarensis
Chrysopogon fallax	Rhynchosia minima (Rhynchosia)
Cleome viscosa	Schoenoplectus subulatus
Clerodendrum tomentosum	Sida fibulifera (Silver Sida)
Corchorus trilocularis	Solanum horridum
Corchorus walcottii	Spinifex longifolius (Beach Spinifex)
Corymbia opaca	Sporobolus australasicus (Fairy Grass)
Cymbopogon ambiguus (Scentgrass)	Stackhousia clementii
Cyperus bulbosus (Bush Onion, Tjanmata)	Stemodia grossa (Marsh Stemodia, Mindjaara)
Cyperus vaginatus (Stiffleaf Sedge)	Streptoglossa decurrens
Dactyloctenium radulans (Button Grass)	Swainsona formosa
Dasykaluta rosamondae (Little Red Kaluta)	Swainsona pterostylis
Dichrostachys spicata (Pied Piper Bush)	Tecticornia halocnemoides (Shrubby Samphire)
Eriachne tenuiculmis	Tecticornia indica subsp. indica
Euphorbia australis (Namana)	Tephrosia clementii
Euphorbia australis var. australis	Terminalia supranitifolia
Euphorbia biconvexa	Themeda sp. Mt Barricade (M.E. Trudgen 2471)
Euphorbia tannensis subsp. eremophila (Desert Spurge)	Themeda triandra
Ficus aculeata var. indecora (Ranji)	Tribulus occidentalis (Perennial Caltrop)
Fimbristylis dichotoma (Eight Day Grass)	Triodia angusta
Grevillea pyramidalis subsp. pyramidalis	Triodia epactia
Hakea lorea subsp. lorea	Triumfetta appendiculata
Indigofera colutea (Sticky Indigo)	



PRECEDENT: 4WD AREA 'NORTH OF THE ROCKS' (CABLE BEACH, BROOME)



Images. Dune barriers (UDLA), Cable Beach (avalook.com), Murujuga National Park signage (UDLA).

5.3 southern amenity node

The southern amenity node formalises the existing amenity hub at the Hearson Cove Foreshore, through the provision of the following improvements.

The high level concept plan adjacent indicates opportunities discussed by stakeholders and the community for 'low-key' enhancement of existing amenity.

Key features include:

1. Provision of informal 2WD carpark area through provision of crushed gravel, for both every day use and for parking during events. Allowance for bus turning and drop off;
2. Improved toilet facilities at existing toilet site (eco-toilets);
3. Designated point for 4WD access to beach;
4. Visitor shelters, gas BBQ, bins and seating that allows for general vehicle access. Easily accessible amenity and provision of bins to limit litter elsewhere on the beach;
5. Space for temporary events / provision of informal 2WD carpark area through provision of crushed gravel;
6. Possibility of addition of walking trail with inclusion of cultural safety warnings and other cultural elements as appropriate on 4WD track to the south. Possibility to include ecological, cultural, historical (European and Aboriginal) and industrial interpretation;
7. Dunal areas beyond the beach to be communicated through signage as Murujuga National Park;
8. Hearson Cove Foreshore Reserve identity, boundaries and associated visitor guidelines to be strongly announced through signage strategy and placement;
9. Provision for roadside parking on Hearson Cove Road at peak times, such as during 'Stairway to the Moon'; and,
10. Provision of 4WD and dog area, north of the Amenity Node.

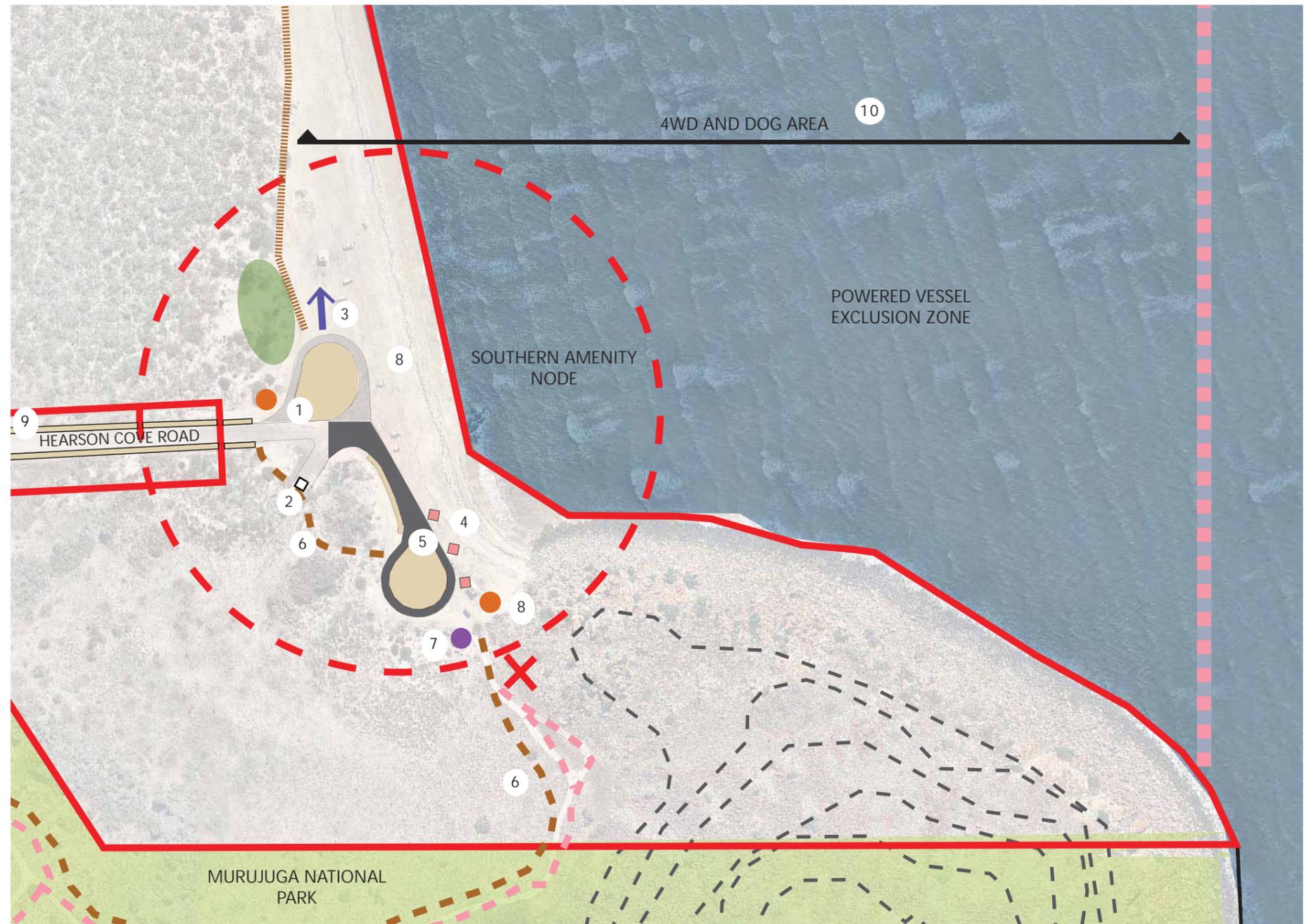
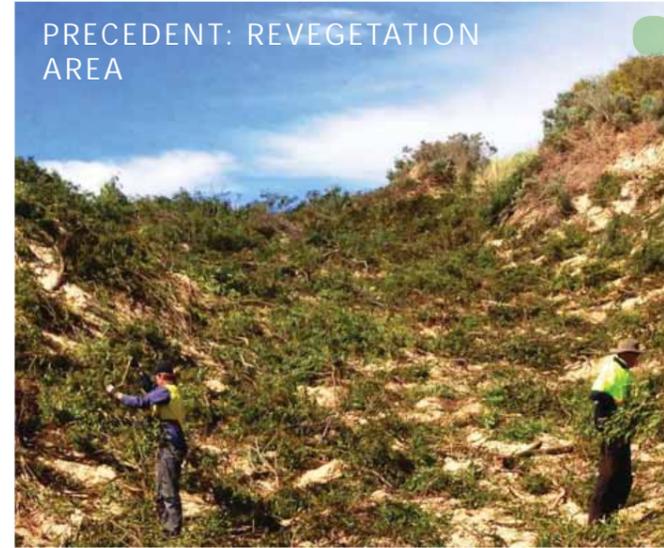
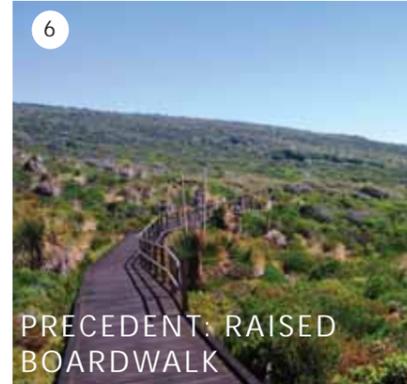
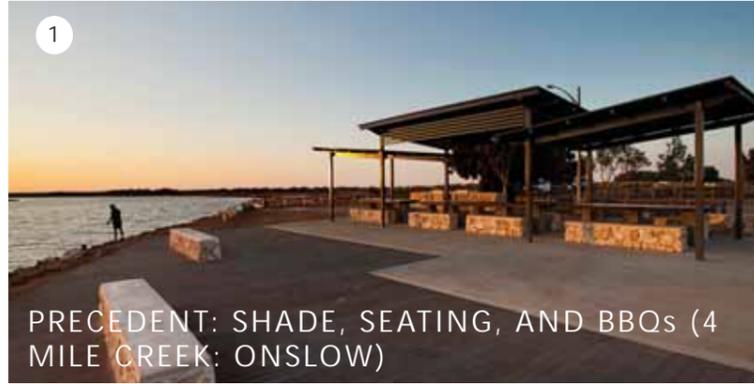


Figure 30. Southern amenity node - Scale: 1:2,500 at A3





DUNAL AREAS BEYOND BEACH TO BE COMMUNICATED AS MURUJUGA NATIONAL PARK WITH ASSOCIATED VISITOR GUIDELINES

Images. Hearson Cove southern amenity node (triathlonoz.com), 4 Mile Creek, Onslow (joshbryne.com), Dune boardwalk (walkintoluxury.com), Fishing station (Replas), Signage (Replas), Karijini National Park (DPaW), Murujuga National Park (DPaW), Revegetation (capelife.com.au).

5.4 management actions

<i>MANAGEMENT ACTION (RECOMMENDATION)</i>	<i>RESPONSIBILITY</i>	<i>TIMEFRAME</i>	<i>THEME 1 // ACCESS ACCESSIBILITY</i>	<i>THEME 2 // AMENITY</i>	<i>THEME 3 // EDUCATION</i>	<i>THEME 4 // PROTECTION</i>	<i>THEME 5 // GOVERNANCE</i>	<i>THEME 6 // RISK MANAGEMENT</i>
1. Formalise 4WD access tracks to work toward one entry and exit point for the beach, to protect vulnerable ecological areas and sensitive cultural areas, and implement a small '4WD free zone' south of the rocks	<ul style="list-style-type: none"> City of Karratha Murujuga Aboriginal Corporation (MLSU) 	Medium term (2 - 5 years)	X	X		X	X	
2. Revegetate and rehabilitate degraded and eroded foredune areas. Undertake an associated ecological and weed survey. Determine a weed eradication program.	<ul style="list-style-type: none"> City of Karratha 	Short term (1-2 years)				X		
3. Formalise and upgrade 2WD access at the Southern Amenity Node. Entry road to be sealed.	<ul style="list-style-type: none"> City of Karratha 	Short term (1-2 years)	X					
4. Formalise and upgrade parking amenity at the Southern Amenity Node.	<ul style="list-style-type: none"> City of Karratha 	Medium term (2 - 5 years)	X	X				
5. Formalise controlled pedestrian access through ecological and culturally sensitive areas through provision of raised walkway.	<ul style="list-style-type: none"> City of Karratha Murujuga Aboriginal Corporation (MLSU) 	Medium term (2 - 5 years)	X	X	X	X		
6. Install low key dune fencing along the Hearson Cove Beach in material appropriate to environmental and social conditions	<ul style="list-style-type: none"> City of Karratha 	Short term (1-2 years)	X			X		

MANAGEMENT ACTION (RECOMMENDATION)	RESPONSIBILITY	TIMEFRAME	THEME 1 // ACCESS ACCESSIBILITY	THEME 2 // AMENITY	THEME 3 // EDUCATION	THEME 4 // PROTECTION	THEME 5 // GOVERNANCE	THEME 6 // RISK MANAGEMENT
<p>7. Implement a signage strategy that:</p> <ul style="list-style-type: none"> • Provides uniformly themed signage, aligned with City of Karratha guidelines, that has a 'national park feel' and that shows a consolidation of one Hearson Cove Foreshore Reserve identity and message. • Interprets the complex European and Aboriginal cultural heritage of the site, as well as the geomorphological, archaeological, ecological and industrial values of the foreshore area • Seeks Traditional Custodian (Murujuga Aboriginal Corporation) input and guidance towards signage which can be read in language as well as English, and which will work toward a broader visitor interpretation of the site. • Provides signage at key access points throughout the site and creates official entrances to the site, and • Clearly delineates and communicates the adjacent Murujuga National Park boundary, and associated guidelines for visitor use; • Clearly delineates and communicates the Hearson Cove Foreshore Reserve boundary, and associated guidelines for visitor use; including clear guidelines on: <ul style="list-style-type: none"> - 4WDing, e.g., below the high tide mark and on designated tracks - Trail bike, quad bike and go-kart use - clear direction that trail bikes, quad bikes and go-karts are not permitted at the Hearson Cove foreshore, and accompanying information about where this activity is permitted in the City of Karratha; - The interaction between motorised and non-motorised vessels, and clear delineation of DoT guidelines on this; - Camping; - Domestic animals; - Traditional Custodian activities; and, - Pedestrian access. • Provides warnings about and guidelines on extreme coastal conditions. 	<ul style="list-style-type: none"> • City of Karratha • Murujuga Aboriginal Corporation (MLSU) 	Short term (1-2 years)	X		X	X		

<i>MANAGEMENT ACTION (RECOMMENDATION)</i>	<i>RESPONSIBILITY</i>	<i>TIMEFRAME</i>	<i>THEME 1 // ACCESS ACCESSIBILITY</i>	<i>THEME 2 // AMENITY</i>	<i>THEME 3 // EDUCATION</i>	<i>THEME 4 // PROTECTION</i>	<i>THEME 5 // GOVERNANCE</i>	<i>THEME 6 // RISK MANAGEMENT</i>
8. Provide upgrades to low key, low maintenance amenity at the Southern Amenity Node that compliments current uses, in materials appropriate to environmental and social conditions. Existing amenity improved and upgraded as follows: <ul style="list-style-type: none"> - eco-toilets; - existing shelters; - picnic tables; - wood fired BBQs; and, - litter bins. 	<ul style="list-style-type: none"> • City of Karratha 	Medium term (2 - 5 years)		X				
10. Detailed landscape plan to be implemented for Southern Amenity Node to integrate amenity features and access.	<ul style="list-style-type: none"> • City of Karratha 	Short term (1-2 years)		X				

<i>MANAGEMENT ACTION (RECOMMENDATION)</i>	<i>RESPONSIBILITY</i>	<i>TIMEFRAME</i>	<i>THEME 1 // ACCESS ACCESSIBILITY</i>	<i>THEME 2 // AMENITY</i>	<i>THEME 3 // EDUCATION</i>	<i>THEME 4 // PROTECTION</i>	<i>THEME 5 // GOVERNANCE</i>	<i>THEME 6 // RISK MANAGEMENT</i>
<p>11. Continue to develop strong relationships with Traditional Custodians, to work towards shared management goals and governance of foreshore area, including:</p> <ul style="list-style-type: none"> - investigate the transfer of the City's Hearson Cove reserve in to the Murujuga National Park, which in turn transfers management responsibility to DPaW and MAC; - shared agreement on visitor perception of and communication of the Hearson Cove Foreshore Reserve / Murujuga National Park boundary; - continue to work towards development of partnership or agreement between City of Karratha and Traditional Custodians to maximise the benefit and value of the Murujuga Rangers' time spent at Hearson Cove; - future cultural heritage and ecological surveys of the site to be undertaken and / or sharing of information and data (e.g. cultural and ecological survey information) to aid in management of site and so that significant sites can be protected; - data gathered in cultural heritage and ecological surveys to be passed to relevant government agencies, if culturally appropriate; - formalise arrangements on cultural management or monitoring of site by Traditional Owners to aid in day-to-day management issues and site surveillance, this may consider shared responsibility for increased surveillance; and, - opportunity for City of Karratha to continue to align with the Murujuga National Park Management Plan and, where appropriate, align with the future Murujuga Cultural Management Plan, currently being developed. 	<ul style="list-style-type: none"> • City of Karratha • Murujuga Aboriginal Corporation (MAC) 	Short term (1-2 years)			X	X	X	

<i>MANAGEMENT ACTION (RECOMMENDATION)</i>	<i>RESPONSIBILITY</i>	<i>TIMEFRAME</i>	<i>THEME 1 // ACCESS ACCESSIBILITY</i>	<i>THEME 2 // AMENITY</i>	<i>THEME 3 // EDUCATION</i>	<i>THEME 4 // PROTECTION</i>	<i>THEME 5 // GOVERNANCE</i>	<i>THEME 6 // RISK MANAGEMENT</i>
<p>12. Hearson Cove Stakeholder Reference Group to meet on an 'as needs' basis, to continue and build upon the shared governance processes established during the development of this FMP, and to build upon existing shared responsibility for the foreshore area</p> <ul style="list-style-type: none"> - opportunities for increased surveillance through greater communication with the other management bodies in the area, e.g. the future Murujuga Living Knowledge Centre. - regular meetings to discuss management goals for Hearson Cove that are shared by the City of Karratha, industry, Murujuga Aboriginal Corporation, government departments and various community groups. - regular meetings to allow the fine tuning of day-to-day goals around shared surveillance, on-the-ground management, and community involvement on site. - various strategies and management plans of adjacent industry and the Murujuga National Park are referred to and integrated in to management strategies for this foreshore area, to maintain a shared direction. 	<ul style="list-style-type: none"> • City of Karratha 	Short term (1-2 years)			X		X	
13. Development of an Event Management Plan in the event that large scale events are undertaken at Hearson Cove.	<ul style="list-style-type: none"> • City of Karratha 	Medium term (2 - 5 years)						X
14. Emergency Response Plans for events at Hearson Cove to be undertaken on an event by event basis.	<ul style="list-style-type: none"> • City of Karratha • DFES • WA Police • DPAW • St John of God 	Medium term (2 - 5 years)						X

<i>MANAGEMENT ACTION (RECOMMENDATION)</i>	<i>RESPONSIBILITY</i>	<i>TIMEFRAME</i>	<i>THEME 1 // ACCESS ACCESSIBILITY</i>	<i>THEME 2 // AMENITY</i>	<i>THEME 3 // EDUCATION</i>	<i>THEME 4 // PROTECTION</i>	<i>THEME 5 // GOVERNANCE</i>	<i>THEME 6 // RISK MANAGEMENT</i>
15. Development of a Traffic Management Plan for Hearson Cove that details required traffic monitoring, traffic calming, along Hearson Cove road, overflow parking etc.	• City of Karratha	Medium term (2 - 5 years)	X					X
16. A detailed Coastal Vulnerability study should be undertaken in the event that further development is undertaken at the foreshore area.	• City of Karratha	Medium term (2 - 5 years)	X					
17. In the event that further development is undertaken at Hearson Cove Foreshore, a detailed study of Industrial Buffer Zones and their implications should be undertaken	• City of Karratha	Medium term (2 - 5 years)						

Note:

Hearson Cove Stakeholder Reference Group will meet on an 'as needs' basis to provide input in to the above Management Actions, as required.

Any proposed foreshore works to be undertaken in consultation with MAC and with regard to, but not limited to, the DAA Aboriginal Heritage Due Diligence Guidelines.

The Hearson Cove foreshore is an important place for the community of the City of Karratha, and is a tourist hub that is set to grow in popularity. By building on the existing strengths of the foreshore, and by addressing the weaknesses as arising from background analysis and stakeholder and community engagement, this FMP provides a framework for the ongoing use and management of the foreshore area. This Foreshore Management Plan recommends that by building on the existing strengths offered by the unique landscape setting of Hearson Cove, a plan can be set in place for a sustainable future for this important community asset.

Improvements to existing amenity are central to the future of the Hearson Cove foreshore area. At present, existing amenity is well used but does not reflect the importance of this tourism destination. The provision of low-key and universally accessible foreshore amenity will ensure this area is accessible for all, and that it reflects its growing popularity.

There is strong community and stakeholder involvement at the Hearson Cove Foreshore. This FMP has found that there is an opportunity to build upon and formalise this through a shared governance model, to continue to collectively work toward future management goals for this foreshore area. By building upon the strong foundation formed through the development of this FMP, key stakeholders and community members can continue to work towards shared management goals for this popular foreshore area. This governance model also provides opportunities to continue the relationship which is being developed between City of Karratha and the Murujuga Aboriginal Corporation, by continuing to align with the Murujuga National Park Management Plan and by working with the Murujuga Cultural Management Plan, currently in progress, as appropriate and when it becomes available.

The issues of access and protection are key to the sustainable use of this foreshore area. Though a formalisation of 4WD, 2WD and pedestrian access of the foreshore area, many of the associated issues will be addressed.

Improvements to education will also play a central role in future foreshore management. Clear communication of boundaries, and guidelines on how to behave in the foreshore reserve as well as the national park will assist a self moderating community who are keen to 'do the right thing'. Education around European and Aboriginal history and culture, the unique geomorphological, ecological and archaeological setting, as well as the industrial context, will do a great deal to communicate the unique qualities of Hearson Cove.

Additionally, putting processes in place which future proof this popular foreshore area, with regard to events and risk management, will ensure that it can continue to be enjoyed well in to the future.

The key issues of access, governance, amenity, protection, education and risk management have been addressed to provide an approach to the ongoing management of this foreshore area, whilst acknowledging and responding to current community uses and potential future uses. Through this approach, the current value embedded within this foreshore area is respected, while the sustainable and ongoing use of this important foreshore amenity is ensured.



Images. Hearson Cove (Ken Mulvaney)

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Yara, Industrial buffer information as provided.

Yara, Storm surge data as provided.

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appendix 1. nature map species report



NatureMap Species Report

Created By Guest user on 07/10/2015

Current Names Only Yes
 Core Datasets Only Yes
 Method 'By Circle'
 Centre 116°47' 51" E,20°37' 50" S
 Buffer 1.5km

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
1.	4891 <i>Abutilon fraseri</i> (Lantern Bush)			
2.	3223 <i>Acacia arida</i>			
3.	3241 <i>Acacia bivenosa</i>			
4.	13500 <i>Acacia coriacea</i> subsp. <i>coriacea</i>			
5.	3356 <i>Acacia gregorii</i> (Gregory's Wattle)			
6.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
7.	4583 <i>Adriana tomentosa</i>			
8.	17422 <i>Adriana tomentosa</i> var. <i>tomentosa</i>			
9.	2646 <i>Aerva javanica</i> (Kapok Bush)	Y		
10.	20018 <i>Amaranthus undulatus</i>			
11.	<i>Aname mainae</i>			
12.	25736 <i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
13.	14555 <i>Avicennia marina</i> subsp. <i>marina</i>			
14.	6606 <i>Bonamia media</i>			
15.	12716 <i>Brachycton acuminatus</i>			
16.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
17.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
18.	11670 <i>Capparis spinosa</i> var. <i>nummularia</i> (Coastal Caper)			
19.	2949 <i>Cassutha capillaris</i>			
20.	25575 <i>Charadrius leschenaultii</i> (Greater Sand Plover)		IA	
21.	25576 <i>Charadrius mongolus</i> (Lesser Sand Plover)		T	
22.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
23.	273 <i>Chrysopogon fallax</i> (Golden Beard Grass)			
24.	2988 <i>Cleome viscosa</i> (Tickweed, Tjinduwadhu)			
25.	6732 <i>Clerodendrum tomentosum</i>			
26.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
27.	13467 <i>Corchorus trilocularis</i>			
28.	4867 <i>Corchorus walcottii</i> (Woolly Corchorus)			
29.	17092 <i>Corymbia opaca</i>			
30.	24876 <i>Ctenophorus isolepis</i> subsp. <i>isolepis</i> (Crested Dragon, Military Dragon)			
31.	279 <i>Cymbopogon ambiguus</i> (Scentgrass)			
32.	777 <i>Cyperus bulbosus</i> (Bush Onion, Tjarmata)			
33.	818 <i>Cyperus vaginatus</i> (Stiffleaf Sedge)			
34.	290 <i>Dactyloctenium radicans</i> (Button Grass)			
35.	24091 <i>Dasykaluta rosamondae</i> (Little Red Kaluta)			
36.	3612 <i>Dichrostachys spicata</i> (Pied Piper Bush)			
37.	<i>Drombus</i> sp.			
38.	24570 <i>Ephianura tricolor</i> (Crimson Chat)			
39.	421 <i>Eriachne tenuiculis</i>			
40.	4617 <i>Euphorbia australis</i> (Namana)			
41.	35307 <i>Euphorbia australis</i> var. <i>australis</i>			
42.	4619 <i>Euphorbia biconvexa</i>			
43.	12097 <i>Euphorbia tannensis</i> subsp. <i>eremophila</i> (Desert Spurge)			
44.	31578 <i>Ficus aculeata</i> var. <i>indecora</i> (Ranjil)			
45.	851 <i>Fimbristylis dichotoma</i> (Eight Day Grass)			
46.	24958 <i>Gehyra punctata</i>			
47.	24959 <i>Gehyra variegata</i>			
48.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
49.	15975 <i>Grevillea pyramidalis</i> subsp. <i>pyramidalis</i>			
50.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
51.	19137 <i>Hakea lorea</i> subsp. <i>lorea</i>			
52.	25541 <i>Haliastur indus</i> (Brahminy Kite)			
53.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			



NatureMap Species Report

Created By Guest user on 07/10/2015

Current Names Only Yes
 Core Datasets Only Yes
 Method 'By Circle'
 Centre 116°47' 51" E,20°37' 50" S
 Buffer 1.5km

Area (ha) 706.24
 Taxa: Naturalised 3
 Native 107
 Endemics: 0
 Families: 48
 Genera: 89
 Conservation Status: - 99
 3 2
 T 1
 IA 7
 4 1
 MS Status: - 109
 PN 1
 Rank: - 96
 subsp. 10
 var. 4

Top Ten Families

Family	Species	Records
1. Fabaceae	13	20
2. Poaceae	12	15
3. Malvaceae	7	19
4. Euphorbiaceae	6	8
5. Scolopaciidae	5	8
6. Muridae	4	8
7. Charadriidae	4	6
8. Cyperaceae	4	5
9. Chenopodiaceae	4	5
10. Diplodactylidae	3	5

Top Ten Genera

Genus	Species	Records
1. Acacia	4	8
2. Euphorbia	4	6
3. Indigofera	3	5
4. Charadrius	3	5
5. Gehyra	2	6
6. Triodia	2	2
7. Corchorus	2	2
8. Themeda	2	3
9. Adriana	2	2
10. Swainsona	2	2

Endemic To Query Area

Name ID Species

Conservation Status

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.

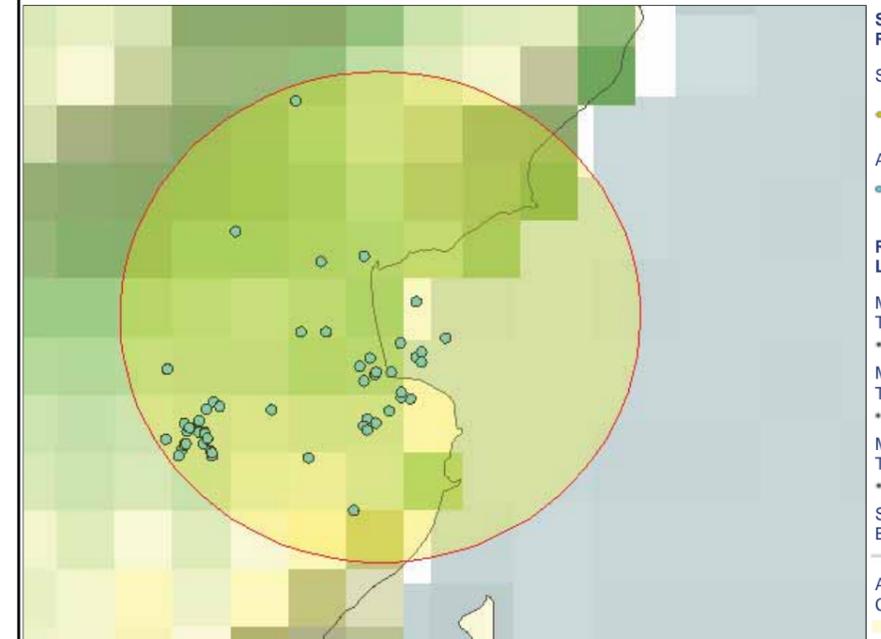
10/7/2015

NatureMap



Printed by Guest user on 7/10/2015

Query details : Current Names Only=Yes; Core Datasets Only=Yes; Method=By Circle; Centre=116°47' 51" E,20°37' 50" S; Buffer=1.5km;



Search Results

- Selected
- Selected Species
- All Results
- Other

Reference Layers

- Major WA Towns
- Major WA Towns
- Major WA Towns
- State Borders
- Australian Continent



appendix 2. city of karratha online survey results

Hearson Cove Foreshore Management Plan Survey Results

Question 1

Response	Count	
Live here	87 95.6%	
Work here (live elsewhere)	2 2.2%	
Tourist	1 1.1%	
Other	1 1.1%	
<i>Total: 91</i>		

No Items to Display

Question 2

Response	Count	
Karratha	77 84.6%	
Dampier	7 7.7%	
Wickham	4 4.4%	
Other - please add:	3 3.3%	
<i>Total: 91</i>		

Fremantle

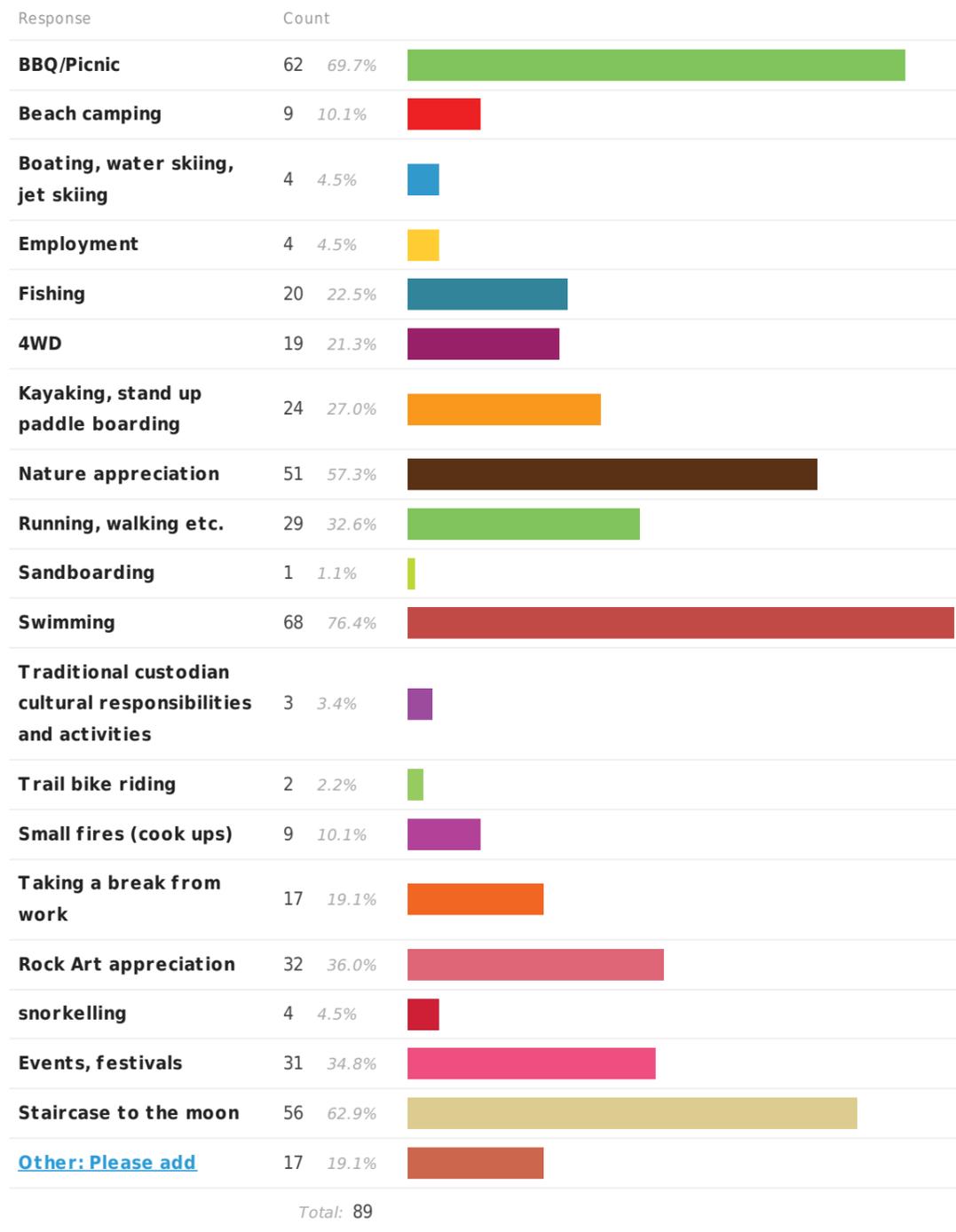
Perth

Adelaide

Question 3

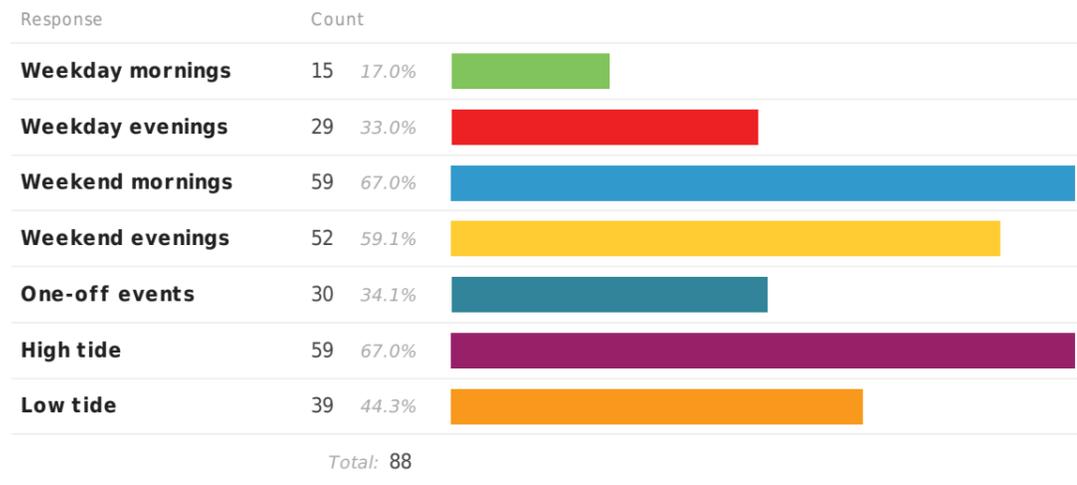
Response	Count	
Multiple times per week	6 6.7%	
Once a week	23 25.6%	
Once a month	39 43.3%	
A few times a year	21 23.3%	
Rarely	1 1.1%	
<i>Total: 90</i>		

Question 4

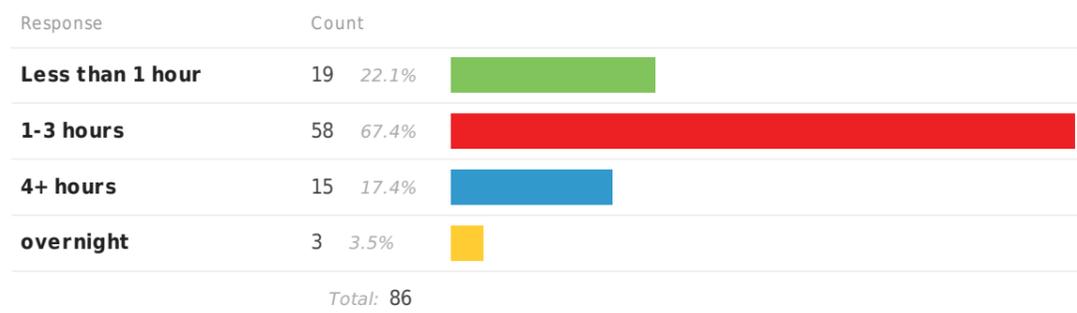


- walking the dog, photography, brining visitors/family/friends to show them the area (touristy things)
- Dog walking
- Photography
- Mainly go to spend time with my dog walking the tracks & flats at low tide and swimming
- Kitesurfing
- Walking dog
- Inspection
- Artist, painting.
- being able to swim & walk the dogs
- Kitesurfing
- Dog exercise
- Swim with dog
- Photography
- Kitesurfing
- Taking the horses to the beach
- Walk the dogs
- Am a former resident of Karatha

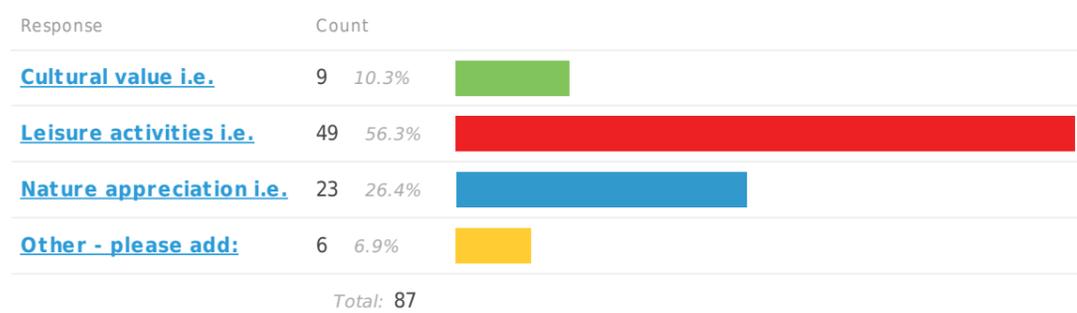
Question 5



Question 6



Question 7



The opportunity to swim and kayak in the middle of such amazing scenery

Art

great chilled place at high or low tide - great place to walk dogs, kids & just get together as family

Catching up with friends

I value both cultural & nature value of equal importance

There must be a unique biodiversity out on the Burrup and at Hearson Cove, it would be fantastic to have more information/signage out there about this and in particular have a trail or short walk where people and children can learn more to appreciate it.

natural beauty revealed on tides, rock art, shell beach, tiny crabs etc

Pristine

Walking over the rocks , watching the tide change

its a great natural beach to chill out at, have a picnic etc.

The beautiful scenery / serenity

its natural beauty

Rock art

Natural habitat

lanscape and habitat

the unique landscape, stillness, natural beauty

Low tide walks, photography

I love this place; the cultural aspects as well as the natural environment ... every visit gives me the gift of seeing something new.

Good safe place to introduce my young daughter to the ocean

swimming

Fishing and exploring with kids

Go for a swim at high tide (when the wind is off the shore) and BBQ. Staircase to the moon.

Clean safe beach

swimming, walking dog, BBQ , relaxing with friends and family

more shelters/bbqs and user friendly toiley facilities (for kids to use toilets)

walking my dog

Swimming

Photography, Picnics, 4x4, kayaking, BBQ, events

swimming at high tide & stairway to the moon

swimming with the kids

lounging with some snacks and a bevvie

Swimming picnicing

swimming khyaks

Swimming, 4WDing, dog exercise

Swimming

Dog and family time

Picnics and Swimming

Swimming, sunbathing, spending time with friends

Relaxing, walking, taking in natural beauty

watching the tides, the wildlife, driving along the beach, walking, swimming

Great place for swimming at high tide

Swimming

Picnics and swimming

4 wheel driving

Socializing, swimming, catching up

Kite surfing

Parking right on the beach swimming with the horses

Swimming, paddleboarding

Might attend barbecues there. (We bring our own. no need for the shire to build more stuff there!!)

Permanent shade structures

lighting, tourism signage, after hours lighting (solar?), warning signage as appropriate

Viewing platform and information hub - chat with the local history office regarding Hearson's visit to the area, his relationship with the Yaburara people, origins of the name Burrup and Murujuga, where the vessel "Dolphin" would have anchored when it visited the site with Francis T Gregory etc. etc.

A

Controlled Access, Rehab area's,

Heritage protection

Interpretive information about Aboriginal culture.

Designated areas for fires

needs to be looked after

Shelter

More permanent shade, better carpark

I am very concerned about an ammonia leak occurring at the Yarra Pilbara plant while hundreds of people on the beach! What steps procedures will Yarra take to manage this risk?

Highlighting of the historical value of the site - with information for tourists and locals.

Dog Area

This is a place of peace and beauty ... I'd like to see activities kept to non-powered ie kayaks, sup, kite surfing, swimming etc.

I want it left as it is, I don't want the shire to go stick their big noses in and start telling everyone what to do. Leave it as it is and don't build anything there.

I don't like the way the 4WDs all go along the foreshore and park up wherever - it's actually a very short length of foreshore. It's nice to be able to park up and look out over the Cove but I don't think it helps with the areas coastal stability or the feeling of relaxing and enjoying nature that you can have. Also I presume the dunes are quite vulnerable so keeping 4WDs in a designated place would be best for conservation management, although I'm sure this won't go down well!

No power vesals

Designated dog area ... not the whole beach.

damage by boating and human waste (rubbish)

don't have powered water craft - will ruin it for everyone & stop wildlife, water creatures hanging out

ensure nothing impacts quality of environment

Protection of all marine life

Create a marine park & banning of jet ski recreation

The inshore marine environment is one of the features that makes the cove unique so yes, an area should be designed as protecting the marine environment (should there be any special features that are in need of marine protection).

Ability to access them but preserve them as well for future generations

Management of 4WD access across the hind dunes, particularly where there are cultural heritage sites (e.g. shell middens)

Controlled area via Murrujuga Rangers

Screening off the disgusting ammonia plant. It shouldn't be there wedged in amongst a national park.

Protection of areas of cultural significant and the natural environment

rock art and flora and fauna

Mangroves

Dunes and rock formations

Sand dunes, bush tracks

Limit the amount of visitor damage

Don't build anything else there, leave it alone.

If there is unique biodiversity or conservation features out there (I'm not sure myself) then these should be protected. It is difficult to reach other protected areas within the City along the shoreline (class A nature reserves are reached by boat) so to have a nature conservation area that is accessible to everyone would be a fantastic asset for the City.

Question 10

Response	Count
	21 responses

Hearson's is lovely. Just the way it is. I've never seen or heard of any issues on this beach.

Install more interpretive information about Aboriginal heritage and culture. Make a designation dog/horse exercise area, not the whole beach. Fence off areas where 4WDs aren't allowed to go, because it's a free-for-all at the moment and they are causing damage. Install more beach shelters with shade. Have more evening events like the WA Ballet as that was fabulous. Block tracks that need to be rehabilitated to stop the 4WD'ers going where they like ... it's a national park. Better information about boundaries of the National Park and heritage areas.

Please don't change Hearson's Cove greatly. The great thing about it is the freedom out there and everyone is friendly because it is relaxing. If you bring in rules and things people will arc up at each other. While having jet skis in another area would be nice, if you don't want to be near them you can move to another part of the beach. I love the freedom and nature of the area and go to walk my dog when I just want to relax with him and explore. Please please don't change the atmosphere or make it commercial.

The plan needs to strongly consider other stakeholders and their development plans over the next 10 - 20 years. Murujuga Living Knowledge Centre and tourism infrastructure is critical.

a good coffee shop/ restaurant would be amazing there.

In general Hearson Cove seems to be well used and used well (not misused) and well maintained

I have witnessed small children playing by the water nearly taken out by a 4x4 driving on the waters edge. Also I am forever picking up rubbish and broken glass that has been dumped by campers and party goers.

Hearson's is lovely & the way it is now is pretty cool - don't ruin it & build it up too much

Don't over regulate the use of the beach - we live in the country!!

Pls pls allow us to drive our 4wd onto the beach for day recreation use. Pls let us launch dinghy's to access airport creek and this side of Nickol bay. Pls put a buffer between jet skis and beach goers it's so dangerous at present. If you ban beach launching of power boats dinghies jet skis pls upgrade access to cowrie cove as an alternate launch site for dinghies.

Do not restrict 4wd access to the beach

I have accessed the area for many years and have witnesses little degradation of the area apart from the typically expected graffiti of facilities already in place.

During stairway period, very heavy use/impact on place

12 of 13

Need to respect the cultural values of the areas and preserve area for future generations

Its great to be able to drive directly onto the beach but sometimes vehicles drive to fast creating dust clouds.

Don't over load the place with signs and infrastructure its appeal is its uncluttered natural setting. Maintain 4WD access onto beach with the exception of an area tot eh southern end of the beach. Most people abide by this unspoken rule anyway due to slope of the beach, perhaps also include no dogs down that end.

This place is a kite surfing hot spot during the winter months.

I'd like to see solar lighting installed at Hearsons Cove - in fact along the back beaches too. This would encourage people inc families to enjoy these places safely in the evenings. I loved Ballet on the Beach last year, but could not get a ticket to this years event and whilst it's a different subject, events at Hearsons should be encouraged, but maybe for 2 nights so that the majority of the community can enjoy instead of the minority. Maybe the local rangers could do weekend talks down their too about the history of Hearsons, and maybe indulge in activites such as cooking demos, art workshops, etc ... no doubt there's someone with a million great ideas. An adult BBQ evening with a dj or local musicians inc indigenous would be awesome. Weekend cafe would be welcome too for anyone who has the collatoral to set up :-). Personally I don't swim there as have seen and respect what lives there, so an ocean water pool would be on my wish list too ha ha - I can dream!

Love Hearsons, dogs love chasing seagulls and kids love walking on low tides to see crabs, be good to have some kind of secure area for dogs to play and not scare other beach goers when they lose interest in birds and go bolting towards other people, dogs or kids!

As a former Karratha resident & having a great love of this special place, any developmental upgrades would seriously affect the uniqueness of the area.

It is perfect just as it is, it doesn't need the shire making a lot of rules, it doesn't need other facilities built. Leave it as it is.

If you'd like any further information about the Hearson Cove Foreshore Management Plan, or if you'd like to be involved in the Community Workshop in Karratha, please contact:

Response	Count
Yes	14 37.8%
No	23 62.2%
<i>Total: 37</i>	

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appendix 3. indicative costings for landscape works april 2016 (supplied by Essential Environmental and City of Karratha)

	Short term (1-2 years)	Medium (2-5 years)	Long Term (5-10 years)	
Hearson Cove FMP				
Dune fencing/ bollards	\$150,000			
Implement signage strategy	\$7,500			
Formalise and upgrade parking	\$55,029			
Revegetate degraded foredunes		\$61,488		
Provision of low key, low maintenance, amenity structures.		\$332,329		
Totals	\$212,529	\$393,817	\$0	\$606,346

Please note: Costs are indicative only and will require verification at future planning stages

