

Parry Beach Background Report 2022

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The Shire of Denmark would like to acknowledge the traditional custodians throughout Western Australia and their continuing connection to the land, waters and community. We pay our respects to all members of the Aboriginal communities and their cultures; and to Elders both past and present.

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1 Background

1.1 Previous Reports and Guiding Documents

In 2010 environmental consultancy Land Insights prepared a *Coastal Reserves Management Strategy and Action Plan (2010-2020)* for the Shire of Denmark. The preparation of the Management Strategy was a collaborative process with input from Shire of Denmark, state government agencies, community groups and individual community members and developed management recommendations for the four Shire-managed coastal reserves: Ocean Beach Reserve (R24913, R20578); Parry Beach Reserve (R20928); Boat Harbour Reserve (R7723); and Peaceful Bay Reserve (R24510).

1.2 Subject Area and Location

Reserve gazettal

Reserve number 20928 was initially vested in the Denmark Road Board in 1932 (Liell-Cock, 2009). It was then vested in the Shire of Denmark by virtue of a Vesting Order dated 20th June 1956, by the Government of Western Australia pursuant to Section 333 of the *Land Act 1933* (WA).

Subject area

The subject area for the Background Report is defined as Parry Beach Reserve, Crown Land Reserve number 20928, accessed off Parry Road in the locality of Parryville, WA. The Parry Beach Reserve is vested for the purpose of Camping and Recreation. Locals have historically referred to the area as 'Parry's'.

Parry Beach Reserve is bounded by Parry Inlet to the north-northeast (Kordabup River), the Southern Ocean to the south, William Bay National Park to the east, Quarram Reserve (R33842) and a disused limestone pit (R39668) to the west and private property to the north-northwest. The reserve is a Class A reserve vested in the Shire of Denmark on behalf of the Crown. Parry Beach Reserve provides public access to the Southern Ocean, pristine beaches, Parry Inlet, and contains a campground facility, salmon camp fishing lease, and a lease with the Denmark Boating and Angling Club.

The subject area is accessed off South Coast Highway, a major national arterial route, from the north along Parry Road, which is a local Shire managed road reserve. Refer to Map 1 – Land Tenure (Appendix B) outlining the subject area.

Surrounding land uses

William Bay National Park (gazetted in 1956 as a Class A Reserve 24482) is located to the northeast and east of the subject site and is formally accessed off South Coast Highway to the recreational nodes of Greens Pool, Elephant Rock and Madfish Bay. It covers an area of 1705ha and visitors are attracted to the park for scenery, swimming and snorkelling, kayaking, fishing, surfing and other marine activities. The national park is managed by Department of Biodiversity, Conservation and Attractions (DBCA) Frankland district. The *Walpole Wilderness and Adjacent Parks and Reserves Management Plan 2008 (WWMP)* is a statutory plan which guides the management of the park. Visitors to Parry Beach utilise the access point off the shire-managed reserve to four-wheel drive (subject to inlet conditions), surf and beach walk along the western extents of William Bay Beach areas. DBCA are responsible for and manage the beach area to the east of the Parry Inlet.



To the west is Quarram Nature Reserve (gazetted 1976 Class A reserve 33842) managed by DBCA under the WWMP. This nature reserve covers 825ha and includes the locally known Owingup Swamp Nature Reserve (gazetted 1989 Class A Reserve 41010) which is primarily reserved for the conservation of flora and fauna. A four-wheel drive access track to Eagle's Nest beach access site is accessed off Parry Road.

To the north is Parry Inlet, which is surrounded by Unallocated Crown Land (UCL) along the western, northern and eastern fringes of the water body.

To the north along Parry Road is private property which is farmed for grazing of cattle and fodder production. Originally the farms were cleared for dairy production, which has now ceased due to market forces and smaller agricultural farming structures on the local farms. Fodder production is only for silage during growth months for stock feed.

Located to the northwest off South Coast Highway is Parryville Community Hall. In the early group settlement of the area, Parryville Hall and school were developed for meeting places, dances and church services (Trail & Grieve, 2011) to service the local farming community.



Figure 1: mouth of the Parry Inlet



Figure 2: adjacent rural property off Parry Beach Road

2 Values

This section outlines the values of Parry Beach Reserve as identified by the community. This is an inventory of literature and local history to outline the value of the reserve and provide guidance for future management of Parry Beach Reserve.

2.1 Historical Values

Campground History

Parry Beach was a popular area and was used extensively by locals for social get-togethers and picnics dating back to the 1920's.

In the early 1950s the current caretakers hut was built by Doug and Margaret Tucker as a shop whilst Margaret also worked as a cook for the Pinniger/Smith salmon fishing team. Camping became popular in the late 1940's and the campground evolved, with the fee for camping as 4 shillings per night (or 1 pound per week) (Liell-Cock, 2009).

In the 1970s the Shire received an application to develop a commercial caravan park on the site. The threat of commercialisation was enough for a group of locals, campers and fishermen to band together to oppose the idea, as they didn't want to lose this beautiful low key camping area. It was then that the Parry Beach caretakers' role was taken on by Jean and Sam Brenton. Jean was passionate about Parry Beach and one of the original environmentalists long before they became commonplace.

In 1983 the Shire called for tenders to make a commercial caravan park to the South-West of the existing campground. No tenders were received, just a request from the newly formed Parry Beach Voluntary Management Group (PBVMG) for there to be a Coastal Management Plan drawn up before any development took place. The PBVMG was formed with the view to assist the Shire in looking after the reserve and managing the camping area which was to be "run as low-key, nature-based camping, to accommodate mainly tent style camping".

In 1992 the first Management Agreement between the Shire and PBVMP formalised the group's responsibilities for the entire reserve including the campground.

In 2009 a Management Order was placed on the campground area through the *Western Australia Land Administration Act 1997* and the *Transfer of Land Act 1893* to designate the area for the purpose of "Camping and Recreation" with the power to lease or sub-lease for this designated purpose.



Figure 3: locals at mouth of inlet - circa 1936



Figure 4: Campers at Parry's in the 1950s



Figure 5: The original general store

A new 21-year Management Agreement was developed in July 2012 between the Shire of Denmark and PBVMG. The agreement outlined the management arrangements and responsibilities of the campground and included the whole of Reserve A20928 (excluding those portions otherwise leased by Council).

The current group of volunteers not only manage the very popular campground but also carry out activities such as dune revegetation, firebreak/walk trail maintenance, rubbish/recycling collection, control of invasive species, wildlife rescue and cleaning the public ablutions and BBQ area used by day visitors. The PBVMG have received several awards and recognition for their contributions towards management of this reserve.

The volunteer groups' clear passion for the area, the campground and the environment, and their decades of dedicated care of the reserve has assisted the Shire in their management role. The group define their objectives for managing the reserve as:

- To provide consistency in managing the precious assets of the reserve;
- To continue legacy – up to three generations have been involved in the reserve and its management; and
- To have a role as guardians of the heritage and environment.

The volunteers of the PBVMG are living representatives of the generations of history within the reserve, and the strong sense of ownership and passion that forms through connections with the land and personal involvement in caring for the land.



Figure 6: The current caretaker's cottage at Parry Beach



Figure 7: Jean Brenton



Figure 9: Entrance to the campground



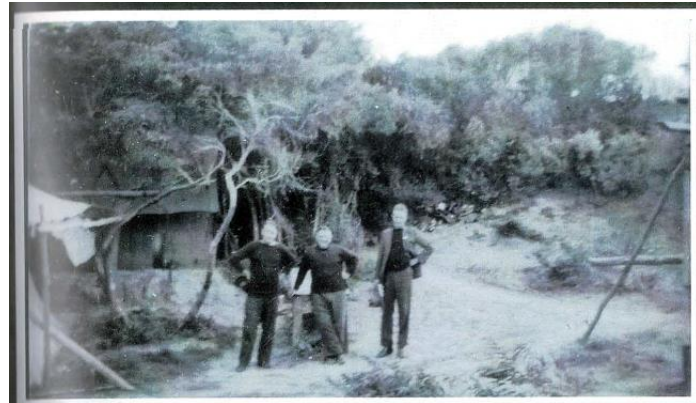
Figure 8: View from the caretaker's cottage

Commercial fishing lease

Parry Beach was named by explorer Alfred Hickman in the 1930s in honour of English Admiral and Arctic explorer Sir William Edward Parry. The location was first used by locals and visitors in the early 1930s. Commercial salmon fishing along the south coast commenced in the 1940s when local farmer, Bill Pinning, explored the use of Parry Beach, making it the oldest commercial fishery in Western Australia. Salmon fishing became a tourist feature with hundreds flocking to the beach to swim and watch the netting of the salmon fish (South Coast Salmon and Herring Fisheries, N.D.).

The history of fishing at Parry Beach has been captured for the Pinning family in a personal photographic book which outlines the history of Parry Beach. The Pinningers started operating at Parry Beach in 1947 after attempts to fish at Greens Pool were unsuccessful. After realising Parry Beach was a suitable place to fish, the first road into Parry Beach was established by the fishermen. Commercial fishermen have continued to operate every year for the past 74 years.

The fishing lease was originally signed by L. Pinning in 1979 for annual use of the area for salmon fishing during the months of February to May. The fishing lease and camp is now managed by Mark Shepherd under the current fishing lease terms. The salmon industry is bound by the current WA Code of Practice for Responsible Fishing and licensed through the Fisheries Department of WA for commercial fishing licensing. The camp now operates with four permanent huts and is supported by seasonal caravans for the working team. Annual operations generally commence with the setup of the infrastructure in February and cease by April with decommissioning of the camp in May. Nets are shot from the beach via boats and retrieved through the use of tractors and winches. Operations occur along the main Parry Beach area from the carpark to the Inlet.



Parry Campsite, 1949

Figure 10: Parry campsite 1949, courtesy Les Pinning

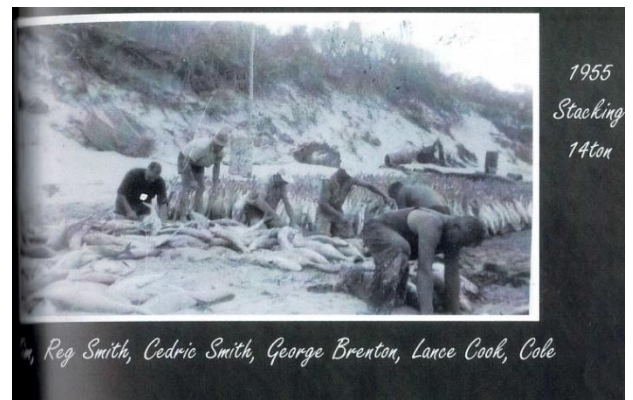


Figure 11: Salmon fishing 1955, courtesy Les Pinning



Figure 12: Salmon fishing on the beach in the 1980s. courtesy Les Pinning



Municipal heritage inventory

The Shire of Denmark Municipal Heritage Inventory includes the Parry Beach Settlement as outlined in Table 1, which includes the Parry Beach Reserve and lots associated with the leases.

ASS No	Year Added	Name	Lot/Loc/Res	No	Street Name	Catchment	Level
The names given to these places are what the building was originally called							
3494	1999	Group Settlement House (Parryville)	Lot 5420	194	Pates Road	Kordabup	Cons
3073	1999	Parry Beach Settlement	Reserve 20928, Lots 303, 304, 307 & 308		Parry Beach Road	Kordabup	Cons
3066	1999	Parryville School	Reserve 19925 (Brenton Reserve), Lot 5393	2830	South Coast Highway	Kordabup	Cons
3008	1999	Point Hillier Cairn	Reserve 11960 Lot 7		Near Parry Road	Kordabup	Cons

It is noted that the fishing lease “net shed” was built circa 1947 and remains important history to the salmon camp. The caretakers’ cottage was built in the 1950s to assist with the visitors to the campground and represents an important heritage icon for the reserve. History of the reserve and connections to families and people is central the community values of the Parry Beach Reserve.

Table 1: Section of the Shire of Denmark Municipal Heritage Inventory



Figure 13: Salmon fishing net shed (circa 1947), being the oldest structure on the reserve

Denmark Boating and Angling Club (DBAC)

The Denmark Boating and Angling Club (DBAC) Inc. was established in 1924 and is a community group made up of approximately 80 paying (current) members. DBAC have a lease agreement with the Shire to operate events, maintain the site and camp at an area within the Parry Beach Reserve to the south of the main Parry Beach campground area and southwest of the main day use area.

The lease area is not open to the general public for camping and is utilised by the DBAC members for field days, events and members’ camping. The DBAC have 12 field (fishing) events per calendar year, with 7-8 events that may be held within the Parry Beach Reserve, utilising their campsite. Events may involve boat fishing or land/shore-based fishing activities. Generally, the members camp over weekends for 2-3 nights. Some members of the committee have extended stays during peak periods (i.e. January) for site security. Incremental fishing and camping may occur by members and their family throughout the year.



Figure 14: DBAC main shed area on lease



Figure 15: DBAC entry point to lease area

2.2 Recreational Values

The recreational values of the reserve are highly regarded, however formal facilities are restricted to the coastal access, day use area and the campsite in the southeast of the reserve. The current recreational values are outlined in this section.

Camping: the campground is unique and 'nature-based' with no powered sites. Camping is restricted to 45 designated sites with a 'first-in, best-dressed' policy.

Fishing: recreational fishing, both boat-based and shore-based, are very popular year-round at the beach.

Surfing: a very popular recreational activity at the beach with surf zones located near the mouth of the Inlet, William Bay Beach and reef areas in the south.

Beach: the beach was listed as a primary focus for activities in the area with swimming, children playing, shore-based activities, beachcombing, jogging and walking. Activities were listed along the main beach and the "back beach" near Point Hillier lookout.

Boating: from large boats to small dinghies and jet-skis, boating is very popular but was noted to be difficult, at times, to launch and retrieve the boats from shore with little protection from swell and seas.

Four-wheel driving: common activity for the use of the beach area, recreational four-wheel driving to the inlet and William Bay Beach (subject to inlet bar being closed).

Walk Trails: walking and hiking is very popular with trails between the campsite, beach-side trails to the inlet, William Bay and the Bibbulmun track. Bushwalking, hiking and walking in the natural environment is an increasingly popular tourism activity.

Hang gliding: an infrequent activity undertaken on the old limestone lease area (now rehabilitated) to the southwest of the reserve, accessed from the reserve road network.



Figure 16: typical campsite within the camping ground



Figure 17: surfers at Parry Beach. Courtesy Nic Duncan Photography



Horse-riding: a large number of community members utilise the beach for exercising and recreational horse-riding ventures. This is one of the few beaches where horses are allowed to visit in the region.

Canoeing/Kayaking: at the inlet, in the Southern Ocean, this activity has seen an increasing popularity with visitors.

Dog exercise: the dog exercise opportunities along the south coast are limited to Shire-managed reserves and Parry Beach is one of the few between Denmark and Peaceful Bay for dog exercise and camping (with dogs).

Diving and Snorkelling: pristine waters off Parry Beach offer excellent snorkelling opportunities around the reef shallows. The deeper waters provide opportunities for spear fishing and observational diving.

Geocaching: this activity is increasing in popularity with youngsters, teenagers and adults. There is recent evidence to suggest there are geocached sites already within the reserve.

Relaxation and Meditation: to visit a beach is identified by some as the key to relaxation and personal meditation.



Figure 18: 4WD tracks along main beach, Parry Beach Reserve



Figure 19: natural features within the reserve

Figure 20: View of the campground, main carpark, fishing lease, main beach and Parry Inlet where most of the recreation activities are undertaken in the reserve. Photo courtesy of Airborne Maps



2.3 Indigenous Heritage and Cultural Values

The reserve is situated within the Noongar/southwest Aboriginal language group area. The Bibbulmun people speak for the country stretching from Denmark, northwest toward Nannup and inland to include the Manjimup area (Trail & Grieve, 2011). Aboriginal heritage and Noongar peoples' relationship to the ecological landscape is strong. Culturally significant components include plants and animals, which can be important for tool making, hunting, gender specific sites in the landscape, meeting sites, skin/family group icons/totems, significant plants for food, medicine and for ceremonies. Plants and animals are an integral part of the cherished physical and spiritual relationship that Noongar people have with the land.

A search of the Department of Planning, Lands and Heritage (DPLH) PlanWA website database revealed a single registered Aboriginal heritage site located in proximity – Registered site 4485 Parry Inlet Fish Trap – located to the north of the Parry Beach Reserve in the Kordabup River (Parry Inlet; Figure 22; DPLH, 2021a). Although only one single record is registered for the area, more sites that are not yet registered are deemed likely to be present, as there have been little to no anthropological surveys in the area (pers comms Albany Office of Heritage DPLH, 2021).

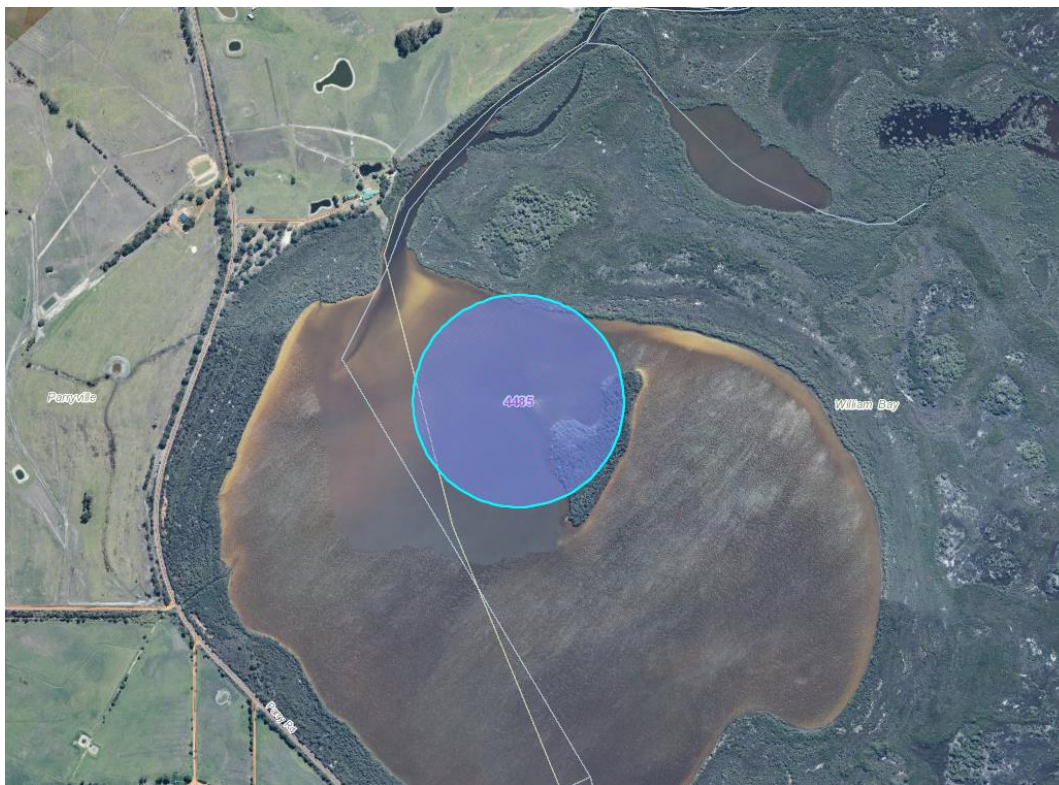


Figure 21: Excerpt from Department of Planning, Heritage and Infrastructure website PlanWA, (DPLH, 2021) showing DIA registered site 4485

The Albany Heritage Office of DPLH have identified that the Parry Beach Reserve is a significant area for camping, fishing, food production and hunting, and that there may be other significant sites located within the Parry Beach Reserve area.



Parry Inlet

Parry Inlet holds significant dreamtime and cultural significance to the Noongar people, including the waterway part of the dreamtime river serpent stories, and the importance of traditional seasonal activities involving food and camping. The DPLH's Aboriginal sites Register listed site 4485 Parry Inlet Fish Trap is required to be preserved under the Aboriginal Heritage Act. Buffers to this site and legislative requirements (Section 38 of the Act) prevail near and adjacent to this site in the Inlet. This affects any works prescribed within the subject site adjacent to the inlet.

Coastal camps

Coastal camps along the south coast of WA were important meeting and camping places for the Noongar people. Parry Beach Reserve is likely to have been a significant area with the rocky headlands and viewshed to the lands from Point Hillier and the main public day use area (pers comms Albany Office of Heritage DPLH, 2021). Granite rock features, rocky enclaves and protected near shore pools provide grounds for tool making, food sources and long-term camping areas.

Important flora and fauna totems

Aboriginal culture is integral to the land. The flora, the fauna, and the land that traditional custodians once walked on are intrinsic to cultural stories and heritage. It is recognised that there are significant stories that are yet to be shared by the local Noongar community about the significant flora, fauna, their totems and values of the landscapes of the area.

People and place

Consultation with the local indigenous community along with anthropological and archaeological surveys can enhance knowledge of the indigenous heritage values and can ensure the preservation of the culture of the Bibbulmun people in the Reserve area.



Figure 22: Point Hillier Beach and headlands



Figure 23: granite outcrops in the south of the reserve



2.4 Environmental values

Ecosystem values

The unique nature of southern Western Australia's coastal environment and the recreational opportunities it offers often presents a challenge for planning and sustainable management of the natural environment due to potential conflicting multiple users in concurrence with natural environmental values.

The natural values and assets of Parry Beach Reserve is strongly recognised by the community as a primary driver for engagement in the reserve. Additional to coastal recreational value, the environmental values of Parry Beach Reserve provide numerous ecosystem services, as well as direct and varied benefits to visitors. For example, the large trees and dense vegetation surrounding the campsite offer shade during summer and privacy from other campers. The surrounding intact vegetation also prevents erosion and loss of topsoil. The surrounding wetland and inlets act as a natural filter for groundwater systems and breeding grounds for many biota.

Flora and Vegetation values

Beard (1997) mapped Western Australia's pre-European vegetation association (VA) at a broad scale. Parry Beach Reserve broadly contains two vegetation communities: '*Shrublands with mixed heath and scattered tall shrubs of Acacia, Proteaceae and Myrtaceae species (VA 423)*' and '*Shrublands with mixed heath, of low shrubs with mixed composition (VA 49)*' (Map 2). Approximately 80% of VA423 remains uncleared and intact across Western Australia and within the Warren Interim Biogeographic Regionalisation for Australia (IBRA) bioregion, where Parry Beach Reserve is located (GoWA, 2019). Less than 20% of VA49 remains across Western Australia, however, more than 80% remains intact within the Warren IBRA bioregion (GoWA, 2019).

A desktop analysis of aerial photography and the vegetative spectrum signature, indicates there are likely to be significantly more vegetation communities present than the two broad scale vegetation features identified in the Beard (1997) pre-European desktop survey. Examples of communities likely to be present include those related to key geographical features such as riparian wetlands, the Parry Inlet, granite headlands, and the immediate foredunes, as well as communities associated with micro-climatic features.

Vegetation or floristic communities are considered an association, combination and relationship of different plant species that are recognisable as separate and distinct communities. Natural vegetation communities are under threat from degradation through the significant alteration of habitat from human impact and processes, such as introduction of weeds, clearing, land modification, increased salinity and more. Careful management is required in coastal recreation reserves, such as Parry Beach Reserve, to prevent degradation of vegetation communities occurring and an associated loss of biological values.

Land modification is regulated under the *Environmental Protection Act 1986 (WA)* and the *Environmental Protection and Biodiversity Conservation Act 1999 (Cth)*. Specifically, if clearing of native vegetation is proposed in the future, a clearing permit and further environmental physical surveys may be required.



Threatened Flora and Threatened Ecological Communities (TEC)

Threatened flora (TF) and threatened ecological communities (TEC) are species or communities identified as being subject to threatening processes that may ultimately lead to their extinction without intervention and formal protection. TF and TECs are listed under the state *Biodiversity Conservation (BC) Act 2016* (WA) and the federal *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* (Cth), under categories Critically Endangered (Cr), Endangered (En), Vulnerable (Vu), Extinct (plant species only; Ex), Extinct in the Wild (plant species only; Ew) or Presumed Totally Destroyed (ecological community only; Pd).

Using the pre-European vegetation mapping (Beard 1997), TEC Database search (DBCA 2021) and aerial photographs, the vegetation within the Parry Beach Reserve is unlikely to meet diagnostic features of TECs that are currently recorded as occurring along the South Coast.

While there are no known TECs within the Parry Beach Reserve, there is a known TEC present within the Parry Inlet, which is immediately adjacent to this area (DAWE 2021, DBCA 2021). This TEC is known as the 'Subtropical and Temperate Coastal Saltmarsh (CSM)' and is currently listed as Vu under the *EPBC Act 1999* and as Priority Three under the *BC Act 2018* (Map 2). CSM is defined as the salt-tolerant herbs, succulents and grasses located on bare, muddy, substrate of estuaries or coastal embayments with some tidal connection. Given its proximity to the Parry Beach Reserve, land use and management strategies within the Reserve should be planned to limit potential impacts on the CSM. Potentially threatening processes for the CSM include altered hydrology, invasive species, pesticides, recreation, eutrophication, climate change, sea level rise, inappropriate fire regimes, infilling and acid sulfate soils.

Eight TF are known to occur within a 20 km radius of the Parry Beach Reserve. There are no records of TF within the Reserve (Table 2, DAWE 2021, DBCA 2021), however there may be potential habitat present for these and they are unlikely to have been surveyed within the Reserve area.

Priority listed flora (PF) and priority ecological communities (PEC) are not formally protected under legislation but are listed and managed by DBCA. These are considered species or vegetation communities that do not meet survey criteria or do not have enough data to enable them to be listed as threatened. These PF and PECs are ranked from Priority 1 to Priority 4. 19 PF are known to occur within a 20 km radius of Parry Beach Reserve (Table 2, DAWE 2021, DBCA 2021). There are known records for two of these species, *Andersonia sp. amabile* (P3) and *Lysinema lasianthum* (P4), within Parry Beach Reserve, however, there may be additional populations of PF that have not yet been recorded within the Reserve given the relatively low level of survey effort in the area. PF and PECs need to be considered during any proposals that have the potential to alter habitat for these species and communities.

Table 1: Priority and Threatened Flora recorded within a 20 km radius of Parry Beach Reserve

Species	Common Name	Conservation Status	Database Search
<i>Caladenia harringtoniae</i>	Harringtons Spider Orchid; Pink Spider Orchid	T – Cr En	DAWE PMST
<i>Commersonia apella</i>	Many Flowered Commersonia	T – Cr En	NatureMap, DAWE PMST
<i>Diuris drummondii</i>	Tall Donkey Orchid	T – Vu	NatureMap, DAWE PMST
<i>Drakaea micrantha</i>	Dwarf Hammer Orchid	T – Vu	DAWE PMST
<i>Isopogon uncinatus</i>	Albany Cone Bush, Hook- leaf Isopogon	T – En	DAWE PMST
<i>Kennedia glabrata</i>	Northcliffe Kennedia	T – Vu	NatureMap, DAWE PMST
<i>Microtis globula</i>	South Coast Mignonette Orchid	T	NatureMap
<i>Sphenotoma drummondii</i>	Mountain Paper Heath	T – En	DAWE PMST
<i>Stylidium</i> sp. <i>Kordabup</i>		P1	NatureMap
<i>Caladenia applanata</i> subsp. <i>erubescens</i>	Rose Spider Orchid	P2	NatureMap
<i>Drepanocladus aduncus</i>		P2	NatureMap
<i>Andersonia auriculata</i>		P3	NatureMap
<i>Andersonia</i> sp. <i>Amabile</i>		P3	NatureMap, DBCA TPFL
<i>Hemigenia microphylla</i>		P3	NatureMap
<i>Banksia serra</i>	Serrate Leaved Banksia	P4	NatureMap
<i>Banksia sessilis</i> var. <i>cordata</i>	Parrot Bush, Pudjak	P4	NatureMap
<i>Boronia virgata</i>		P4	NatureMap
<i>Corybas limpidus</i>	Helmet Orchid	P4	NatureMap
<i>Drosera fimbriata</i>	Manypeaks Sundew	P4	NatureMap
<i>Eucalyptus calcicola</i> subsp. <i>unita</i>		P4	NatureMap
<i>Eucalyptus goniantha</i> subsp. <i>kynoura</i>		P4	NatureMap
<i>Gahnia sclerioides</i>		P4	NatureMap
<i>Lysinema lasianthum</i>		P4	NatureMap; DBCA TPFL
<i>Microtis pulchella</i>	Beautiful Mignonette Orchid	P4	NatureMap
<i>Stylidium leeuwinense</i>		P4	NatureMap
<i>Thomasia quercifolia</i>	Oak Leaved Thomasia	P4	NatureMap
<i>Xanthosia eichleri</i>		P4	NatureMap

Nt. Acronyms used in the table include Threatened Flora (T), Priority (P), Critically Endangered (Cr En), Endangered (En) and Vulnerable (Vu).

Fauna Values

Over the past two centuries, the Australian fauna has collapsed to a far greater degree than that reported for fauna in any other continent over the same period (McKenzie *et al.* 2007, Woinarski *et al.* 2014). Threatening processes such as habitat degradation, changes to fire regimes, climate change, and introduced species are among the factors implicated in these declines (Burbidge and McKenzie 1989, Short 2004, McKenzie *et al.* 2007, Burbidge *et al.* 2009, Woinarski *et al.* 2014).

Taxa that are short-range endemics, habitat specialists and/or dietary specialists are likely to be most restricted within their known distributions and many are experiencing geographical contraction and population fragmentation or metapopulation disruptions. Protection of habitat that is important for these groups, resources for shelter, nesting and feeding, and maintenance of connections between areas of critical habitat are key conservation strategies. This approach requires recognition of the main habitat types and the range of conservation significant fauna within the Parry Beach Reserve area, such as threatened species, species covered under international conventions or agreements, endemic species and Gondwanan relicts.

Threatened and specially protected fauna

Threatened and Specially Protected fauna are species that have been adequately searched for and are considered to be threatened or in need of special protection and have been gazetted as such at a State level and/or Commonwealth level. At a State level, this process now occurs under the *Biodiversity Conservation Act 2016* (BC Act; WA). At a Commonwealth level, this process occurs under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act; Cth). The BC Act allows the Minister to declare fauna species to be specially protected for the following reasons:

Schedule 1 – fauna that is rare or likely to become extinct. These species are listed as Critically



Figure 24: Western Pygmy possum (*Cercartetus concinnus*)



Figure 25: Quokka (*Setonix brachyurus*)



Figure 26: Gondwanan relictual *Chenistonia*

Endangered (CR), Endangered (EN) or Vulnerable (VU).

There are five species that are known to occur within the Parry Beach Reserve including: Baudin's Cockatoo (*Calyptorhynchus baudinii*, EN), Carnaby's Cockatoo (*Calyptorhynchus latirostris*, EN), Western Australian pill millipede (*Cynotelopus notabilis*, EN), quokka (*Setonix brachyurus*, VU), and Australian sea-lion (*Neophoca cinerea*, VU) which has been recorded resting on the coastal beaches.

There are five species that have been recorded within 20 km, for which suitable habitat is likely to be present within the Parry Beach Reserve including: western ringtail possum (*Pseudocheirus occidentalis*, CR), chuditch (*Dasyurus geoffroii*, VU), Australasian bittern (*Botaurus poiciloptilus*, VU), fairy tern (*Sternula nereis nereis*, VU) and Main's assassin spider (*Zephyrarchaea mainae*, VU).

In addition, there are a number of species for which the Parry Beach Reserve is within the historical distribution for the species and potential habitat may be present, including curlew sandpiper (*Calidris ferruginea*, CR), great knot (*Calidris tenuirostris*, CR), western ground parrot (*Pezoporus flaviventris*, CR), bar-tailed godwit (Northern Siberian) (*Limosa lapponica menzbieri*, CR and MI at species level), noisy scrub-bird (*Atrichornis clamosus*, EN), red knot (*Calidris canutus*, EN), lesser sand plover (*Charadrius mongolus*), greater sand plover (*Charadrius leschenaultia*, VU), bar-tailed godwit (Western Alaskan) (*Limosa lapponica baueri*, VU and MI at species level), and western bristlebird (*Dasyornis longirostris*, VU).

Schedule 2 – fauna presumed to be extinct. There are two species listed that may have potential habitat within the Parry Beach Reserve area including the Lewin's rail (*Lewinia pectoralis clelandi*) and the rufous bristlebird (*Dasyornis broadbenti littoralis*).


Schedule 3 – birds protected under an international agreement. There are 26 species that are listed on the national List of Migratory Species and covered under international conventions or agreements. These include: common sandpiper (*Actitis hypoleucos*), fork-tailed swift (*Apus pacificus*), short-tailed shearwater (*Ardenna tenuirostris*), ruddy turnstone (*Arenaria interpres*), sharp-tailed sandpiper (*Calidris acuminata*), sanderling (*Calidris alba*), pectoral sandpiper (*Calidris melanotos*), red-necked stint (*Calidris ruficollis*), long-toed stint (*Calidris subminuta*), white-winged tern (*Chlidonias leucopterus*), white-throated needletail (*Hirundapus caudacutus*), Caspian tern (*Hydroprogne caspia*), bar-tailed godwit (Northern Siberian) (*Limosa lapponica menzbieri*), black-tailed godwit (*Limosa limosa*), osprey (*Pandion cristatus*), glossy ibis (*Plegadis falcinellus*), Pacific golden plover (*Pluvialis fulva*), grey plover (*Pluvialis squatarola*), Common Tern (*Sterna hirundo*), crested tern (*Thalasseus bergii*), wood sandpiper (*Tringa glareola*), common greenshank (*Tringa nebularia*), marsh sandpiper (*Tringa*



Figure 27: *Cynotelopus notabilis*



Figure 28: Yellow-footed antechinus (*Antechinus flavipes*)



stagnatilis), grey-tailed tattler (*Tringa brevipes*), and bar-tailed godwit (*Limosa lapponica*). Three of these species are also listed at a State and/or Commonwealth level including: bar-tailed godwit (Northern Siberian) (*Limosa lapponica menzbieri* also CR), grey-tailed tattler (*Tringa brevipes* also P4) and bar-tailed godwit (*Limosa lapponica* also VU or CR at subspecies level).

In addition to threatened fauna, the Department of Biodiversity Conservation and Attractions also maintains a list of priority fauna species. Priority fauna species are those that may be threatened but for which there is insufficient survey data available to accurately determine their status (Priority 1 to 3), species that are rare but are not currently threatened or have recently been removed from the threatened list for other than taxonomic reasons (Priority 4), or species that are conservation dependant (Priority 5). There are 12 priority listed and conservation dependent species within the Parry Beach Reserve area including: south-western brush-tailed phascogale (*Phascogale tapoatafa wambenger*, CD), grey-tailed tattler (*Tringa brevipes*, M1 and P4), black bittern (*Ixobrychus flavicollis australis* (southwest subpop., P2), short-nosed snake (*Elapognathus minor*, P2), Pouched lamprey (*Geotria australis*, P3), Australian little bittern (*Ixobrychus dubius*, P4), blue-billed duck (*Oxyura australis*, P4), hooded plover (*Thinornis rubricollis*, P4), rakali (*Hydromys chrysogaster*, P4), quenda (*Isodon fusciventer*, P4) and western brush wallaby (*Notamacropus Irma*, P4).

Endemic fauna

In total, there are 43 species of vertebrate fauna and an unknown, but likely larger, number of species of invertebrate fauna that are likely to occur in the planning area that are endemic to the southwest of WA. Examples of endemic mammals include: western brush wallaby, quokka, western ringtail possum, honey possum (*Tarsipes rostratus*), mardo (*Antechinus flavipes*), common dunnart (*Sminthopsis gilberti*), grey-bellied dunnart (*Sminthopsis griseoventer*), Gould's long eared bat (*Nyctophilus gouldi*) and the western false pipistrelle (*Falsistrellis mackenziei*). Examples of endemic avifauna include Baudin's black-cockatoo, Carnaby's black-cockatoo, red capped parrot (*Platycercus spurius*), western rosella (*Platycercus icterotis*), western ground parrot, white breasted robin (*Eopsaltria georgiana*), red-winged fairy wren (*Malurus elegans*), western thornbill (*Acanthiza inornata*) and the red-eared firetail (*Stagonopleura oculata*). Two species of snake in the Parry Beach Reserve area are endemic to southwest WA, including the short-nosed snake (*Elapognathus minor*) and square nosed snake (*Rhinoplocephalus bicolor*). The skinks show a high level of endemism, with 13 endemic skink species potentially occurring within the Parry Beach Reserve area. There is likely to be a high level of endemism within the invertebrate fauna in the area. A large proportion of land snails, millipedes, pseudoscorpions, harvestmen and trapdoor spiders in the area are likely to be endemic to the southwest of WA if not to the Reserve area itself. Work undertaken in other reserves have shown a high level of isolation and speciation in these groups due to their confined distributions within disjunct habitats, specific habitat requirements, poor dispersal abilities and low fecundity (Harvey 2002).

Relictual fauna

A range of Gondwanan relictual fauna species occur in the Warren Bioregion within which the Parry Beach Reserve area occurs (Main and Main 1991). Significant examples that may occur within the Parry Beach Reserve area include the salamander fish (*Lepidogalaxias salamandroides*), the pouched lamprey (*Geotria australis*), as well as a large proportion of invertebrates in the area especially freshwater crayfish, mussels, land snails, millipedes, dragonflies, caddis flies, scorpions, harvest spiders, and trapdoor spiders. These types of invertebrates favour habitats that are moist throughout the year, including litter, moss, humus, under bark, at the base of trees, in hollows and overhangs of rotten logs, gullies, creek lines, southern facing hills and in coastal heath where summer fog is prevalent (Main and Main 1991). Even though many of the relict species are locally common, the relatively low number of taxa in these groups, the fragmentation of populations and patterns in speciation means all known

populations are potentially important for biodiversity and conservation. In addition, because all known Gondwanan relicts are also short-range endemics, their restricted habitats, reliance on moisture and low dispersal rates reduce their capability to respond to disturbance.

Riparian and near coastal biota

The Parry Beach Reserve has important habitat value for flora and fauna due to the presence of intact vegetation adjacent to the beach (near shore environments) and healthy riparian vegetation near wetland areas. These areas of vegetation provide habitat that is critical for sustaining breeding and nursery grounds within the wetland and estuarine systems, contribute to important buffering and ecosystem function processes and provide wildlife movement corridors.

The Parry Beach Reserve is important for a range of conservation significant species that are listed in the sections above and contains a diverse range of potential habitat, including estuarine environments and shorelines, oceanic coastline, riparian vegetation, sedgeland, coastal heath, shrublands, thickets and woodlands.

The inlet and beach areas also support fishing (recreational value) and beach activities as outlined in previous sections. The protection of biodiversity assets and maintenance of connectivity of natural areas along the south coast is an important aspect of conservation and management of future recreational or other development within the subject site.



Figure 29: Group of Crested Terns (*Thalasseus bergii*)



Figure 30: Sooty Oystercatcher (*Haematopus fuliginosus*)



Figure 31: Group of cormorants at Parry Inlet



Surface water hydrology

Parry Beach Reserve lies within the Warren Denmark (HZ19_WD) Hydrological zone which is described as; 'Rises in a series of broad benches from the Southern Ocean north to the Blackwood Valley. Deeply weathered granite and gneiss overlain by Tertiary and Quaternary sediments in the south. Swampy in places.' (DPIRD 2020).

There are no major waterways within the reserve; Parry Inlet lies directly along the north eastern boundary of the reserve. Parry Inlet is downstream of the Kordabup River, which runs from north to south before discharging into the Parry Inlet. There is a wetland (low lying swamp area) centrally located in the north of the reserve.

The reserve is located within two hydrological sub-catchments (drainage catchments) being the Parry Inlet – Kordabup River sub-catchment and the Coastal sub-catchment. In the north of the reserve within the Parry Inlet – Kordabup River sub-catchment surface water runs off the reserve toward Parry Inlet. The wetland located centrally in the north of the reserve also receives surface water runoff from its surrounding catchment, including much of the northern and central portions of the reserve. The south-western and south-eastern portions of the reserve are within the Coastal sub-catchment and discharge directly to the coastline. The surface water direction and sub-catchments for the subject site are shown in Map 3 – Hydrology Map.

Hydrogeology and groundwater

The Water Information Reporting (DWER, 2021a) database shows there are no registered groundwater bores within the reserve; there are multiple groundwater bores (private) within the vicinity of the reserve - however no groundwater level information is available online from these records. There are no DWER WIN bores located within the vicinity (1km radius) of the reserve. Two bores supply water within the reserve as show on Map 4 – Master Plan map. No groundwater data has been received to date.

Australian Geoscience Mapping and Department of Water and Environmental Regulation 250K Hydrogeological mapping (DWER, 2019) places the reserve within two hydrogeological zones being the:

- Proterozoic: with the geology described as; '*Granitoid gneiss, minor metamorphic rock and quartzite, generally weathered to clay*'. The aquifer is described as; 'Fractured and weathered rocks - local aquifer, very minor or no groundwater resources.' and
- QUATERNARY - CAINOZOIC - PHANEROZOIC with the geology described as; '*Alluvium, minor colluvium-grave, sand, silt and clay*'. The aquifer is described as; '*Surficial aquifer - local aquifer, possible sedimentary aquifer beneath, minor groundwater resources*'.

The DWER 250K Hydrogeological mapping is shown on Map 3. Parry Beach Reserve is not located within or within the vicinity of a Public Drinking Water Source Area (DWER, 2021b); the nearest PDWA is located approximately 17 kms to the north east, being the Denmark River Catchment Area.

Groundwater extraction for the Parry Beach settlement (campground and fishing lease area) is from bores located behind the barrier dunes to the north of the settlement. Operated by solar pumps and pumped to holding tanks, this groundwater source is the main water supply for the camps. Groundwater flow is expected to be similar to the surface water and generally to the wetland, inlet and sub surface flows to the Southern Ocean, whereby small fresh water expressions can occur frequently along the beach areas. Detailed hydrology mapping and modelling was not undertaken within the scope of this project. The objectives of water management strategies are to ensure both the surface water and groundwater quality and quantity in the Parry Beach are maintained or improved.

Wetlands

Wetlands are an intrinsic part of the hydrology of an area and are widely recognised as significant for their ecological, hydrological, social and economic values. Wetlands have characteristic vegetation, faunal assemblages and geomorphology and typically support a high level of biological productivity and diversity.

One of the frequently observed animals in the wetland in Parry Beach Reserve is the south western snake-necked turtle *Chelodina colliei*, which lives in a broad range of seasonal and permanent freshwater habitats including wetlands, lakes and rivers.



Figure 32: *Chelodina colliei*, the south western snake-necked turtle. Photo courtesy of Denmark Bird Group

A desktop analysis of Department of Parks and Wildlife (DBCWA) Geomorphic Wetlands dataset (2019) found there are no known significant wetlands within the reserve or within a 5-kilometre radius of the reserve. Owingup swamp within Quarram Nature Reserve to the west of the reserve is listed as 'nationally important' in the Directory of Important Wetland of Australia (DAWE, 2019). The wetland in the central west of the subject site and Parry Inlet to the northeast have significant wetland ecological functions to the local environment and drainage from the catchments as described previously are from inland sources. It is perceived that Parry Road intersects some of the surface flows into the wetland to the west and the Inlet north, as shown in Map 3.

There is currently little data about the south coastal wetlands and their critical function, however the importance of preserving wetlands is fundamental in sustainable management.

3 Challenges

Climate change

The impact of climate change on the Parry Beach Reserve, the community and how visitors interact with the reserve, is a key management concern. Climate change impacts will see a need for greater emphasis on disaster preparedness and increase the challenge of protecting infrastructure and vulnerable communities (GoWA, 2019). Potential impacts from climate change at Parry Beach Reserve include:

- Loss of ecosystems, habitat and biological values due to storms, coastal erosion forces and sea level rise;
- Loss of beach for recreation access to Parry Beach, the inlet and William Bay beach;
- Loss of infrastructure from coastal erosion forces and sea level rise;
- Increased severity and impact from bushfires; and
- Loss of commercial capacity for salmon fishing.

Changes to the environment and its function can also arise from naturally occurring events, and modifications to ecological processes, some of which may be attributable to climate change, human interactions, ecological or coastal processes. Responding to climate change presents ongoing challenges to the government, business and the community.

Coastal processes

Coastal processes of the Southern Ocean and the impact of climate change will have a burgeoning effect on Parry Beach Reserve and the wider south coast including erosion impacts resulting in the loss of beach over time.

A major concern is the decreasing beach area and the interaction of vehicles, beach users and four-wheel drive vehicles accessing the upper reaches of the beach and inlet. This is contributing to safety concerns for children, walkers, elderly and infirmed as well as general site concerns. Seasonally, at high tide there is little ability for vehicles with boat trailers to park and for boat retrieval particularly in swell conditions.

The barrier dunes along the edge of Parry Beach provide protection to the flora, fauna and ecosystem in the greater reserve. Vehicle damage, people, and coastal forces have the potential to exacerbate the erosion of these fragile dunes and degrade the associated ecosystems (See Figure 35).

Coastal change anecdotal observations over time include:

- Loss of barrier dunes along the beach over the last 60 years;
- Loss of extent of intertidal beach zone over the last 60 years;
- Coastal attrition (rock collision of sands and transportation) and erosion along the beaches;
- Loss of infrastructure from encroaching coastal forces; and



Figure 33: parking along the beach can exacerbate dune loss. Photo courtesy Les Pinninger



Figure 34: coastal processes can affect the natural environment and associated infrastructure. Photo courtesy S. Ayling



- 
- Changes of the exit and entry point of the inlet.

Climate change and sea level rise will vastly contribute to coastal impacts within the reserve. The Department of Planning Lands and Heritage (DPLH, 2019) WA "Coastal hazard risk management and adaptation planning guidelines" outlines that:

"Coastal zones are vulnerable to adverse impacts from inundation and erosion. The risk to the environment from climate change is influenced by the level of preparedness and response of the community and its recovery capacity." (DPLH, 2019).

The guidelines prepared and implemented by DPLH under State Planning Policy (SPP) 2.6 outlines a risk identification, evaluation and treatment framework for assessing and treating coastal hazards (DPLH, 2021b). This assessment is required for the reserve to identify and evaluate the coastal hazards, document the risks and apply a risk treatment plan in consultation with the community, stakeholders and decision makers.

Conduction of a coastal hazard erosion study would enable more informed decision making and strategic management planning to proactively account for coastal change in Parry Beach Reserve.

Visitor pressure

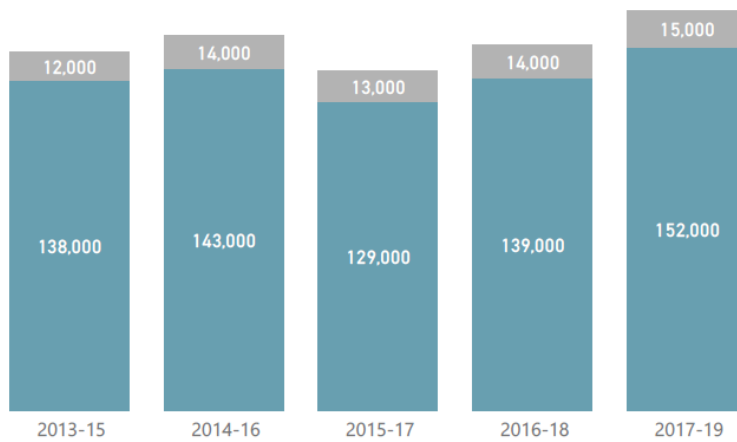
Visitor statistics for the Great Southern Region compiled from 2015-2018 (noting pre COVID-19 period) outlined there are 744,000 annual visitors to the region staying an average of 2.73 nights, bringing in an average spend of \$248,000,000 per year. Of those visitors that were intrastate, 54% were on holiday and 24% of these stayed at a caravan park or commercial camping ground (Tourism WA 2020a). International visitors travelled into the Great Southern mainly for holiday (88%) as did interstate visitors (67%), with most of these visitors listing their accommodation as: hotel/resort or motor inn; friends or relatives' property; and rented house/apartment/flat or unit. This indicates that the majority of visitors to the Great Southern who camp in the region are WA based tourists.

The overnight visitor summary for the Shire of Denmark (Tourism WA 2020b) for 2017/2018 and 2019 outlines 1,786,000 average annual visitors to the LGA, with an annual spend of \$76,000,000. Domestic overnight visitors outlined their purpose of travel mainly for holidays in the Shire (71%) as did international visitors (92%). Domestic overnight visitors outlined their percentage of nights in the Shire at caravan park or commercial camping ground at 25%, compared to 14% of international visitors. Of the statistics collected by Tourism WA the 2017-2019 period has shown a marked increase in visitation since the 2013-2015 period as shown below in Figure 37. These statistics are pre-COVID, which has seen a marked increase in intrastate travel and holidays, with border closures and cessation of international travel.

Tourism WA outlined that in 2020 WA saw a 26% decrease in the overall number of visitors (overnight and daytrip) to/within WA. Total visitor spend in the State decreased by 31%, equivalent to a loss of \$3.4 billion (Tourism WA 2020a). Tourism Research Australia outlines how the COVID-19 pandemic is having damaging and long-lasting impacts on tourism (Government of Australia, 2021). Tourism recovery scenarios undertaken by the Australian government outlines domestic recovery timeframes between July 2022 and June 2023 and international, between October 2023 and February 2025 (Government of Australia, 2021).

Overnight Visitor Trends - Rolling Three Year Average

Market ● Domestic ● International



Market		2013-15	2014-16	2015-17	2016-18	2017-19
Visitors	Domestic	138,000	14,000	129,000	139,000	152,000
	International	12,000	14,000	13,000	14,000	15,000
	Total	150,000	28,000	142,000	153,000	167,000
Nights	Domestic	494,000	466,000	451,000	472,000	537,000
	International	42,000	47,000	49,000	51,000	54,000
	Total	536,000	513,000	500,000	523,000	591,000

Figure 35: Overnight visitor trend (Tourism WA, 2020b)


Visitors to the whole of the reserve have been recorded spasmodically by the Shire with a traffic data logger for Parry Beach during the period Jan-March 2021. The weekly average in late January 2021 was 60 vehicles per day and 223 vehicles on Australia Day.

Increased visitation to the area can result in over use of facilities and degradation to the local environment. These adverse impacts include parking and trampling of vegetation, removing bollards, waste disposal (effluent and rubbish) into the environment, damage to fragile wetlands, hydrology and ecosystem functions (see sections below). Parking and congestion is a known issue as a result of increased visitation to the reserve. The recreational activities and values associated with the reserve are significant therefore protection of the reserve from increasing visitor pressures is paramount in the ongoing management of the area.

Recreational and commercial tourism pressures have the potential to put natural environment values at risk. The social and economic advantages of these activities are to be balanced by sustainable development management planning including in retention of beach access. Access to the beach (vehicle, walking, climbing etc) can increase erosion to sensitive dune systems and coastal environments. Access to these areas can also contribute to an increase in undesirable activities, some of which may be illegal.

Illegal activities have negative effects on the local environment, people and safety of others and can include:

- Dangerous four-wheel driving along the beach;
- Parking in dunes and fragile areas of the beach;
- Campfires outside of the campground area; and
- Congestion of boat trailers on the beach.



Access to the beach for four-wheel drive vehicles is an important feature of the reserve to the community, as well as posing an issue of concern due to potential risks to the safety of children and families on the beach. Access to the larger extent of the beach, Parry Inlet and William Bay Beach (subject to inlet open) is only available from the main carpark area in the southeast of the reserve giving rise to safety concerns at the one access pinch-point. The carpark at the campground and caretakers' office has multiple functions and interactions with pedestrians, vehicles, trailer parking, campers, push-bikes, horses and motorbikes. A recommendation for investigation into alternative access options is advised to reduce the safety risks and congestion at this area.

Biodiversity and heritage loss

Loss of biodiversity and damage to the environment is a significant concern to the community. Damage to the environment and heritage areas can occur from illegal activities, but can also be a result of incidental actions from beach users who are unaware of their actions or from planned activities. Examples include:

- Parking in bird breeding grounds on the beach;
- Introducing into the natural environment weeds, pests and diseases from vehicles and foot traffic;
- Parking near and adjacent to dunes which can destabilise the dune face;
- Trampling and climbing fragile dunes and disturbing vegetation and animal habitat;
- Accidental fire ignition, from campfires in campground or lease areas;
- Clearing incidentally from unmanaged four-wheel drive tracks;
- Loss of habitat and vegetation from development – new and current areas; and
- Destruction and disturbance of heritage: sites, flora and fauna and culturally sensitive areas.

Loss of bird breeding habitat along the beaches due to four-wheel driving and access at bird breeding times has been known to occur. DBCA haven't fenced off the area for a few years as there hasn't been any nesting birds sited according to the Ranger team. If nesting birds were to re-establish nests again, they will use a combination of fencing and signs as they use in other parts of the district, on an as-required basis (pers comms, P. Masters, 2021).

Changes to hydrology, groundwater and stormwater

The potential impacts to water resources in the Parry Beach area is likely to be deterioration in surface water and groundwater quality as a result of:

- Disturbance to acid sulphate soils during maintenance or construction phases of roads or development;
- Movement of sediment and other contaminants during the establishment and operational phase of road construction or development;
- Stormwater run-off of litter, nutrients and other pollutants from camp sites, roads, car parks and farming areas to the west;
- Excessive change to surface water volumes and velocities due to earthworks, road construction and/or development;
- Groundwater contamination due to onsite effluent disposal;
- Dewatering activities which have the potential to mobilise nutrient-rich water into surface water bodies, increasing nitrogen and phosphorus loads that may lead to algae growth problems; and
- Dewatering activities that have the potential to release toxic metals and arsenic due to the disturbance of acid sulphate soils.



Environmental health

Contamination of groundwater can occur through onsite effluent disposal and poor treatment of effluent, which can then enter the groundwater system and disperse into the wider environment and ocean. Sandy soils are poor soils for treating nutrients and eliminating waste from the soil profile (in leachate areas). Leach drains and disposal fields too close to bores for drinking water can contaminate the water supply with bacteria and nutrients.

Effluent disposal sources from the site were identified at the following sources:

- The campground precinct (2 x toilet blocks)
- The caretakers' cottage;
- The fishermen's lease area; and
- Denmark Boating and Angling Club facilities.

The WA Department of Health, through the Shire, legislates the requirements of effluent disposal through the *Health Act 1911* (WA) and the WA Country Sewerage Policy. The Shire of Denmark regulates any new facilities. A systematic review at the renewal of any leases or memorandums of understanding (MOUs) is recommended. The consideration of replacing the current systems with a less invasive treatment system like Alternative Treatment Units (ATUs) should also be considered in future management and development strategies.

Bushfire risks and safety

Climate change is expected to increase the risk of more frequent and intense bushfire events across Australia. Fire weather within the region is characterised by mid-level disturbances across the southwest of Western Australia, bringing unstable atmospheric conditions (thunder and lightning) from the north or northwest wind directions. This is characteristic of "Extreme" Fire Weather conditions in the area and is associated with hot dry conditions prior to storm events. Potential ignition sources such as lightning strikes, machinery and vehicle sparks, campfires and arson are more likely to give rise to bushfires under these conditions.

Prevalent winds occurring during the start of most bushfire events in the region are from the northwest, west and northeast direction. Conditions associated with these winds tend to be dry with low relative-humidity. Strong winds and excessive fuels can lead to hazardous conditions for residents. Strong easterly, north-westerly and south-westerly winds exist at the subject site during dry summer periods (BoM, 2021).

A bushfire risk assessment has not been undertaken formally for this report, however in broad terms the contiguous vegetation to the west, northwest, north and northeast has the highest risk of fire run into the subject area (south is the ocean, which is low risk). Forest Type A and Scrub Type D would be the main vegetation classification (as per AS3959) and are classified as "Extreme" Bushfire Hazard Level and present extreme risks to the subject site.

This, combined with access to Parry Beach Reserve via only one entry road, makes the reserve vulnerable to an extreme bushfire event. Fire impacts on humans (health, psychological and economic) and the environment (loss of habitat, loss of species, communities, connectivity and ecosystem function).

The development of individual bushfire management plans that include pre, during and post fire season actions for individual lease holders and managers at the reserve is recommended. These plans will assist in building resilience, capacity, and preparedness within the community at Parry Beach, and will assist with strategic and local decision making by land managers prior to and during bushfire events.



Visitor risks and safety

Visitor Risk Assessment (VRA) and subsequent Management of Visitor Risks (VRM), is a systematic process of identification and control of a broad range of risks that have the potential to lead to the injury of visitors to land or property. Potential (general) visitor risks associated with the Parry Beach Reserve include (but are not limited to):

- Slips trips and falls on Shire-managed or lease owned structures;
- Dated or illegible signage about key safety messages (coastal risks, currents, rough seas, changing conditions, sharks, ocean rips, rocks areas etc);
- Dune or limestone cliff/overhang risks;
- Regulatory, consistent (as per state recommended tiered level) messaging at sites;
- Structural assessments for soundness of existing platforms, steps, buildings or structures that visitors are invited to;
- Approaching road access and pedestrian access safety signage;
- Overhang vegetation on visibility and pedestrians; and
- Four-wheel drive access/warning signs.

A visitor risk assessment of the reserve with detailed maintenance schedule of the risks documented in a Visitor Risk Management Plan (VRMP) is recommended and the assessment should be as per (or similar to) the DBCA, recommended VRM process in natural areas.

Work health and safety

The Western Australian *Work Health and Safety Act 2020* (WA) and corresponding *Work Health and Safety Regulations (2022)* is recent legislation which makes provision in regards to health and safety of workers, health and safety at the workplace and risks to health and safety arising from the workplace. The implementation of this Act is required by the Crown (LGA), the managers of the workspace and the workspace itself. This Act is relevant for application to the lease areas and commercial operations within the Parry Beach Reserve (e.g., salmon fishing operations on the beach/public interface) as well as to the campground and all associated workers, volunteers and visitors.



4 Opportunities

Recreation

Visitor statistics for the South Coast Region for the last ten years indicate rising trends of visitors to the region. The Recreation Opportunity Spectrum (ROS) is a means of identifying and determining the diversity of recreation opportunities for a natural area. It also is a conceptual framework designed to help clarify relationships (on a regional scale) between recreational settings, activities and experiences. Parkin *et al* (2000) explore “Micro-ROS” to look at classification of individual recreation sites as an important consideration (rather than regional ROS) where particular types of settings are rare (eg. small isolated areas of naturalness in otherwise large areas of modified landscape) or unique (eg. the only site in a large area which is suitable for a particular outdoor recreation activity) (Parkin, *et al*, 2000).

The recreational activities undertaken at Parry Beach Reserve are numerous (as outlined in Section 2.2) and there will be resultant pressures on the infrastructure, environment, and local community with increased visitation.

The system of micro-ROS considers an individual recreation node approach to the planning and management of recreation outdoor activities, as opposed to broadscale zonal approaches. The Landscape Classification System (LCS), which builds on a more local scale the ROS methods outlined by Parkin *et al* (2000), outlines a Landscape class category (biophysical, social and management setting) and associated assessment model to guide management response and legislative obligations and future of the areas. It is also a means for managing recreation succession in natural areas. This methodology could be applied at Parry Beach Reserve for the future sustainable management of the reserve.

Tourism

Tourism not only allows for economic growth in the region, it also aids in employment and local investment in the Shire. Tourism revenue into the reserve (from campsite fee collection) allows for investment back into the reserve to ensure that sustainable management of the reserve continues.

Nature-based tourism can ensure recreational opportunities are available whilst encouraging enjoyment and fostering appreciation of the natural environment. Some existing and potential opportunities include:

- Hike trails and walk trails;
- Bird hide/observation points;
- Canoeing;
- Whale watching;
- Nature based tourism operators; and
- Nature based camping.

Nature-based tourism is one the fastest growing sectors in the global tourism industry. DBCA outlines a two-year action plan for nature-based tourism in WA, focussing on partnerships and private industry sector investment in land and waters managed by DBCA. Some of the actions and recommendations in the DBCA report (trails networks, linkages and visitor access, improving water-based activities conservation of destinations) can also apply to Parry Beach Reserve.

Multiple uses and multiple users in the Parry Beach Reserve are evident and management of this is complex for the Shire and the local on-site custodians, PBVMG. Sustainable adaptive management approaches will be required to balance the increased nature-based recreation and tourism opportunities in the reserve whilst maintaining the environmental values of the reserve.

Nature based camping

Campgrounds are regulated through the *Caravan Parks and Camping Grounds Regulations 1997*. Part 1 of the Regulations sets out the following terms (definitions):

nature based park means a facility in an area that —

- (a) not in close proximity to an area that is built up with structures used for business, industry or dwelling-houses at intervals of less than 100m for a distance of 500m or more; and
- (b) has been predominantly formed by nature; and
- (c) has limited or controlled artificial light and noise intrusion;

The following recommendations from Kinnear and Thompson (2017) also apply to the Parry Beach Reserve:

- Nature based camping can be supported subject to conditions within Priority Agriculture Zones, General Agriculture and Rural Small holding zones if within proximity to a natural attraction (major river/waterway, proximity to coast etc) or tourism attraction (winery, cheese factory etc). Alterations to the Local Planning Strategy (LPS) may be required to accommodate this.
- Nature based camping should be encouraged on private land subject to compliance with implementation and documentation requirements as per the *Caravan Parks and Camping Grounds Regulations 1997*.
- Nature based camping opportunities be assessed by the Shire based on location, tourism merit and justification of compatibility with the present land uses.

Camping statistics

The current length of stay is regulated at Parry Beach campsite through the above-mentioned Act and also regulated through the PBVMG and SoD Management Agreement for campers to stay for a maximum of twenty-one (21) consecutive nights. A community survey undertaken by the Shire in 2021 indicated the average length of stay in the campground by respondents was between <1 week to 2 weeks (92.4%) with substantially less recording as 3-week stays (7.6%).

The PBVMG provided the information on visitor statistics from 2017 and length of stay at Parry Beach from between 2015-2018 shown in Figures 38 and 39 below.

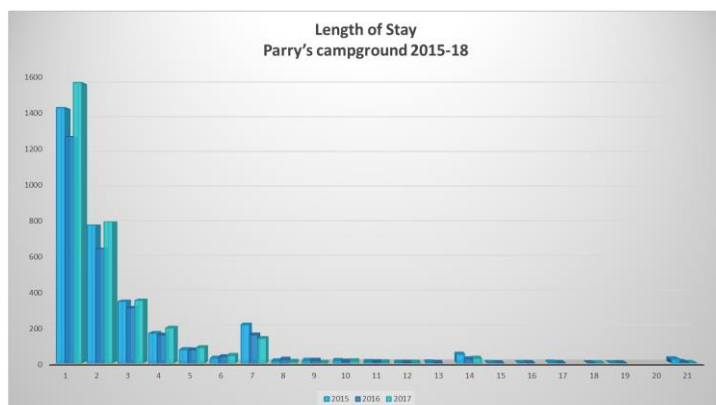


Figure38: Length of stay at Parry campground between 2015-2018

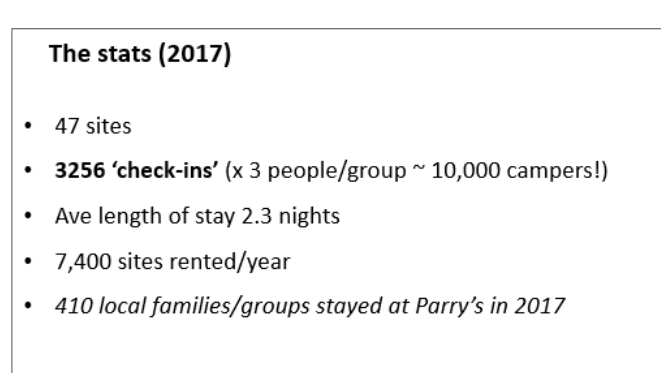



Figure 39: 2017 visitor statistics at Parry Beach campsite



It is recommended that rather than increasing the size and scale of camping at Parry Beach that alternative locations for nature-based camping are researched and promoted through the private sector.

Limiting the numbers on the site is one of the strategies that can be deployed through the precautionary principle, to ensure environmental degradation does not occur to the site. A total of 45 sites are currently available to the general public. These sites are noted by the PBVMG to operate at full capacity during peak times (January and Easter periods). Overflow camping is available at alternative private local caravan parks and the availability of this alternative campsite has resulted in lower overflow requirements at Parry Beach (pers comms PBMG, 2021).

Booking system

Parry Beach campground currently does not have a booking system, rather works on a 'first come first served' basis. A booking system does allow for visitors to be confident of their arrival and stay in the area, however presents challenges for managing situations where visitors fail to arrive at the site; and adds another layer to campground management. The PBVMG, continues to review their system of camp allocation, and the pressures during the busy seasons (January and Easter periods) present the most challenges. These have however, been noted as manageable by the group.


Parry Beach is a natural area and its nature-based camping experience offers visitors an opportunity to explore and engage with nature whilst providing a safe environment for families. A conservative management approach to retain the values of the area is to restrict campsite numbers at the site. Factors limiting expansion of the campsite include community opposition, environmental limitations (effluent disposal, loss of native vegetation, habitat for biodiversity), increased risk mitigation for fire management, and visitor safety. Enlarging or developing this campsite is not recommended without further investigations or without a more detailed site assessment.

Community expectations

The underlying desire from the community is to preserve and protect the natural environment and the nature-based experience of Parry Beach Reserve. In a study recently published in *Ecology and Society*, Masterson *et al.* (2021) outlines the importance of sense of place, with a push for a stronger focus on what people care about and what motivates them to engage in solving sustainability issues. Improved knowledge in behavioural science about the patterns of how people relate to a place can help clarify opportunities and obstacles to collaborations between parties with different interests.

Community sense of ownership with the Parry Beach Reserve is strong, which is positive for outcomes of the reserve as it is noted that with ownership comes respect of the land. The PBVMG invites people to join and be part of the volunteer group, with participation encouraged by the Shire in managing the reserve. Membership of the PBVMG group is sound, however recruitment and retention of members is ongoing, with succession planning crucial for long-term success. To ensure there is a "Sense of Place" retained, consultation with the local and wider community is essential throughout planning and implementation of management action phases. Feedback from the community and visitors to the site is an important aspect of adaptive management, which assists positively with the implementation and management of the reserve.

The diverse community associated with the Parry Beach Reserve have a strong social and spiritual connection to the reserve. These passionate connections to the reserve are an opportunity for sustainable implementation and governance of the reserve. An important factor for ongoing sustainable management of Parry Beach reserve is for consideration and integration of community needs and desires. Retaining the significant identified values of the



reserve (low key camping, natural areas, recreation, flora, fauna, wetlands, heritage, social and economic) will require constant review of the current activities undertaken, future climatic processes and impacts, coupled with ongoing assessments of community expectations for continued sustainable management of the reserve.

Visitor education

To assist with sharing the rich culture and history of Parry Beach and the wider reserve, interpretative educational material is recommended. This can be implemented through static displays, walk trail signage, brochures and web-based material (website, QR codes, social media, geocached activities etc.). A visitor interpretation and signage plan is recommended to be developed in conjunction with the Denmark Historical Society and the Parry Beach community/interest groups. Themes could also be extended to static displays at the Shire and the Denmark Tourist Bureau. Visitor education can assist with reducing illegal, negative and disrespectful activities in the reserve and can also assist with the provision of safety messages in the area.

Targeted information for visitors is imperative for sustainable management, and the reserve should consider a marketing and communications plan for the site to assist visitors to plan their journey and to obtain feedback for both day use and overnight campers. Resources that are currently in place, and others that may assist with key communications and education for the reserve include:

- Electronic messaging, Website messaging, QR coded links to websites;
- Handouts or emails for general enquiries;
- Verbal communications through caretakers and volunteers;
- Ongoing liaisons with stakeholders including: Shire of Denmark, PBMG, South Coast Bushcare Services, Denmark Chamber of Commerce, Denmark Bird Group, Denmark Heritage Society, Denmark Surf Club, DBCA, DBAC, Wagyl Kuip Cultural Corporation.

The involvement and support of the Shire of Denmark and the PBMG in the development and implementation of a communications plan are critical for the plan's success.

Increasing resilience

Resilience is about increasing human capacity to cope and survive with events and activities that occur outside of our control. The challenges presented in this report can be perceived as overwhelming or socially controversial, and can result in feelings of despair for some of the people who live, interact with and recreate in the reserve. The development of a Management Plan presents an opportunity to increase the resilience of the community who have a connection with Parry Beach Reserve.

To increase resilience within the community, key aspects of awareness, education and preparedness for natural events need to be addressed. This should involve scientific and engineering-based assessments of key aspects such as coastal risk, and the preparation of relevant plans to inform, educate and guide decision making.

Protecting biological assets

Biological assets have been identified as one of the core values of visitors to the reserve. Protecting the biological values and assets in the Parry Beach Reserve relies on limiting degradation and considering a holistic approach that acknowledges management and environmental goals as fundamentally interlinked.

To understand the challenges and ensure the future protection of biodiversity from natural or anthropogenic impacts, key knowledge gaps should be identified and biological surveys should be collated for the reserve. As a minimum, biological data should be available documenting the flora, vegetation and fauna within the reserve, the presence/absence of



threatened species, and presence/ absence of threatened ecological communities within or adjacent to the reserve. This then provides baseline data for decision making relevant to protection and management of biological values, such as establishing buffers, identifying potential implications of disturbances, and identifying habitat protection requirements for critical species. Refinement and adaptation of protection measures and activities near and adjacent to biological values can then be undertaken.

Sustainable and adaptive management

The relationship between the Shire and the PBVMG is crucial to the sustainable management of the reserve. The management agreement provides a legal mechanism of management between the Shire and PBVMG, the communications plan, policies, procedures, management plans and development of works procedures and operational plans contribute to functional implementation and execution of key management actions within the reserve (excluding the lease areas). Policies, procedures and plans should be flexible to enable periodic adjustment as new information becomes available through scientific studies and site assessments, as per the adaptive management model.

5 Community Consultation

Extensive community consultation was undertaken in 2021 on the future direction for sustainable management of Parry Beach Reserve in the form of an online community survey, community forum, and one on one targeted stakeholder engagement. Findings of this consultation are compiled and available in a document entitled *Parry Beach Preliminary Report (2022)*.

Community survey

The community survey undertaken by the Shire of Denmark during May 2021 received over 270 responses/contributors over the three-week period. The values considered most significant to the community included beach accessibility (208); and the pristine environment (205); followed closely by the beach being a dog/horse accessible beach (189). The values of highest of importance to the community were the environmental and recreational values of the reserve.

The main areas of concern (Figure 40 and 41) were identified as:

- Congestion (123);
- Coastal erosion (112);
- Litter (101);
- Accessibility (83);
- Safety (70);
- Campsite availability (70);
- Other (49); and
- Bushfire (36).

Safety concerns identified congestion as the biggest safety issue (112 respondents), 73 having concerns with the multi-users on the beach, and 91 respondents having no concerns.

In response to the survey question regarding making any changes to the reserve, most answered “*only if environmental concerns demand it*”, indicating that for the majority of responders their desire is for the reserve to remain the same (Figure 42).

The overwhelming majority of respondents (71.9%) responded in the negative when asked if they supported the expansion of the existing campground. Only 28.1% supported this notion (Figure 43).

In answer to the question regarding supportive alternative access, if the current access point became untenable, an overwhelming 75.9% supported this compared to 24.1% who were not in favour of alternative access.



Figure 40: Summary of community survey responses



Swimming, beach access and dog exercise were listed as the top three activities undertaken in the reserve.

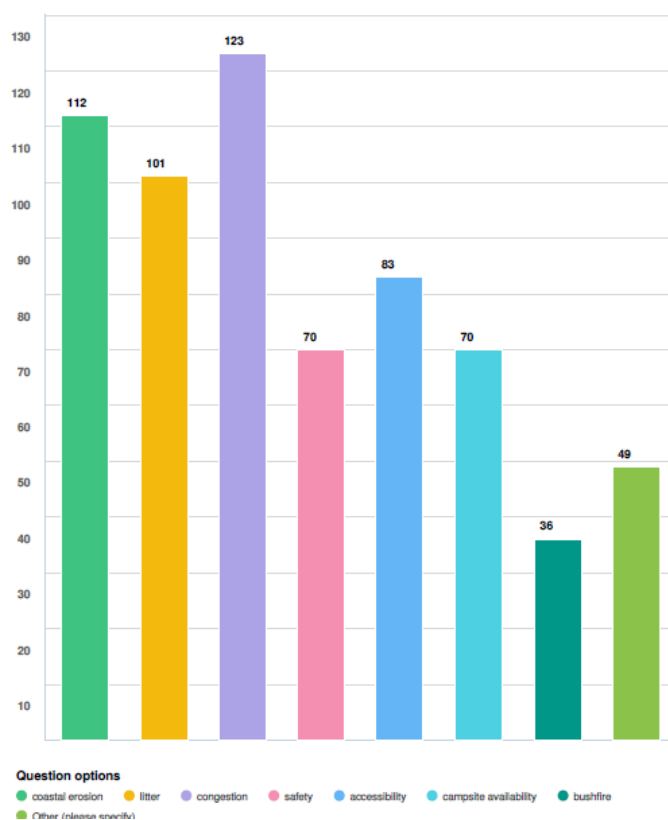
The majority of survey responders (93.4%) visited the reserve on a weekly, fortnightly or seasonal basis.

The survey indicated the average length of stay in the campground was between <1 week to 2 weeks (92.4%) with substantially less respondents recording up to a 3 week stay (7.6%).

Most outlined they stayed outside of school holidays and during the summer months (noting the majority of the respondents were Denmark townsite/Ocean Beach/Lights Beach residents, 118 of the 270 respondents).

88.9% of respondents outlined that nature-based camping was important to them, and 71.9% wanted no change to the campground (in regards to expansion; Figure 43).

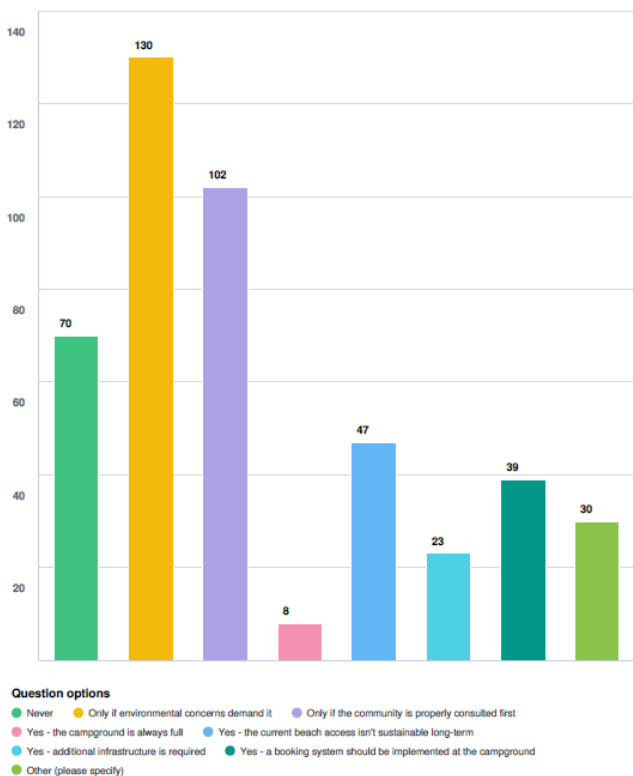
Q5 What are your main areas of concern at Parry Beach? (select applicable)



Question options
 ● coastal erosion ● litter ● congestion ● safety ● accessibility ● campsite availability ● bushfire
 ● Other (please specify)

Figure 41: Responses to main areas of concern at Parry Beach

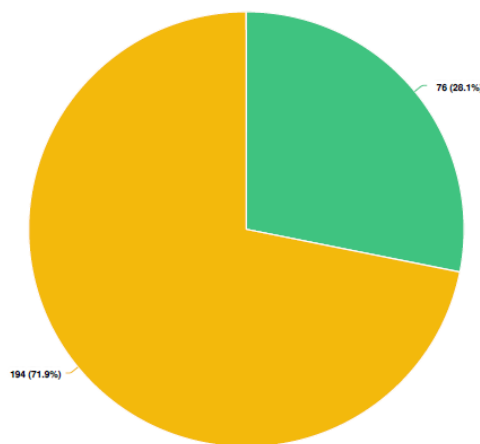
Q6 Would you make any changes at Parry Beach? (select applicable)



Question options
 ● Never ● Only if environmental concerns demand it ● Only if the community is properly consulted first
 ● Yes - the campground is always full ● Yes - the current beach access isn't sustainable long-term
 ● Yes - additional infrastructure is required ● Yes - a booking system should be implemented at the campground
 ● Other (please specify)

Figure 42: Responses to change at Parry Beach

Q14 Would you support expansion of the Parry Beach campground site to accommodate more visitors?



Question options
 ● Yes ● No

Figure 43: Responses to expansion of Parry Beach campground

Community forum

On the 24th May 2021 a community forum was held at the Shire of Denmark. A total of 45 community people attended, as well as Shire of Denmark Staff, Shire Executive and Councillors. The aims of the night were to:

- Share views on Parry Beach Reserve in a manner that respected others and their views.
- Facilitate conversations to better understand and integrate community views and expectations into future strategic management planning for the reserve.
- Identify the 'big three' items the community loves about Parry Beach, the areas for improvement and three techniques to improve the area.
- Allow for the community to engage with the Shire in respect to the wider community values.

Harley Coyne from Department of Planning, Lands and Heritage (DPLH) gave a welcome to country outlining the significance of the Parry Beach Reserve to culture and the indigenous community. The Parry Beach planning framework was briefly presented to the community. The community members were separated into groups of 6-8 people and a series of three questions were put to the room. The questions aimed to encourage the community to discuss what they liked and were passionate about the reserve, areas of concern, and how they thought the reserve could be improved.

The top three areas of concern identified by the community were congestion on the beach, coastal erosion and litter. In addition, prioritising the needs of locals before tourists was a common topic raised. The key points included:

Positives – Low-key, nature-based camping; family-friendly; multiple recreational activities available.

Concerns – Safety and congestion at beach access point; limited parking; vehicle speed on the beach compromising safety.

Solutions – Secondary alternative beach access point; separate entry point for pedestrians from camping area onto the beach; expand parking; protection of birds from vehicle traffic.



Figure 44 & 45: Community forum workshop evening held on the 24th May 2021

Stakeholder engagement

Key targeted stakeholders identified for consultation in 2021 on the future management direction for Parry Beach Reserve included:

- Parry Beach Voluntary Management Group;
- DPLH – Heritage Officer;
- Professional fishermen;
- South Coast Bushcare Services;
- William Bay National Park Progress Association;
- Bibbulmun Track Foundation;
- Department of Biodiversity Conservation and Attractions (DBCA);
- Denmark Bird Group; and
- Denmark Boating and Angling Club.

One-on-one meetings were held with the various stakeholders listed above, as part of the community consultation that took place in 2021. The conversations with these groups included meetings, site visits, phone calls and email correspondence. Their knowledge, custodianship and relationship to the reserve has been an important contribution towards a better understanding of community expectations in relation to the forward strategic management direction for the Parry Beach Reserve.



Figure 46 & 47: Stakeholder consultation held on the 25th May 2021

The findings of the community survey, the community forum and the targeted stakeholder engagement has been compiled and can be accessed in the *Parry Beach Preliminary Report (2022)*.



6 Roles and Responsibilities

Shire's role

Parry Beach Reserve is vested in the Shire for the purpose of 'Camping and Recreation'. A 21 year Management Agreement, developed in 2012 between the Shire and Parry Beach Voluntary Management Group determined the Group would be responsible for management of the portion of Reserve 20928 - excluding otherwise leased areas. The Management Agreement was recommended to be reviewed at 5 year intervals. The Shire's responsibilities within the Management Agreement are to cover public liability insurance, and insurance of built assets; to provide for cleaning materials and removal of campground rubbish; to maintain water supplies; and to pay an annual management fee from within the municipal budget to cover expenses incurred in managing the Parry Beach facility on behalf of the Shire.

Parry Beach Voluntary Management Group (PBVMG)

The PBVMG take pride in managing the reserve and associated camping area on behalf of the Shire in accordance with the Service Delivery Standards and Code of Conduct. The work they do encompasses general maintenance of the reserve and camping area including cleaning toilets, collection and recording of camping fees, manage campsite allocation and on-site bookings, compliance with campsite rules in relation to dogs and firewood, and to maintain communications with the Shire. The groups is run by passionate invested locals, and succession planning is required to ensure longevity of this successful operational management model.

State government

The WA state government has responsibility for legislation, actions and management of crown land and the actions within our state and society that affect our people and land. The state has a supporting role in supplying funding to local agencies for the protection and conservation of reserves and natural areas. Of priority and noted through the consultation process is for state government agency DBCA to assist with the planning and guidance of bird protection along the high-tide areas and the adjacent beaches near Parry Inlet.

National government

The Australian government has overarching responsibility for legislation, actions and management of crown land and the actions within our nation and society that affect our people and land. Changes to national legislation are not frequent, however management actions and plans should be reviewed at 5- and 10-year review periods. Funding from national sources for coastal protection, threatened species management and recovery, economic (regional) development and other sources should be actively sought to assist in ongoing on-ground management of the reserve.

Community

From the indigenous peoples to the early settlers of the area, the community has a significant association and social affiliation with the reserve. Recreational and social connections to the reserve provide an opportunity for enhanced appreciation and understanding of the environmental values of the reserve. The underlying desire from the community is to preserve and protect the natural environment of Parry Beach Reserve for current and future generations.

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9 Common Acronyms

AS – Australian Standard

BEEP – Bushfire Emergency Evacuation plan

BMP – Bushfire Management Plan

DBCA – Department of Biodiversity, Conservation and Attractions

DFES – Department of Fire and Emergency Services

DPLH – Department of Lands, Planning and Heritage

EAW – Emergency Access Ways

EAR – Emergency Access Routes

SoD – Shire of Denmark

PBVMG – Parry Beach Voluntary Management Group

ROS – Recreation Opportunity Spectrum

VRA – Visitor Risk Assessment

VRMP – Visitor Risk management Plan

LWMS – Local Water Management Strategy

WAPC – Western Australian Planning Commission



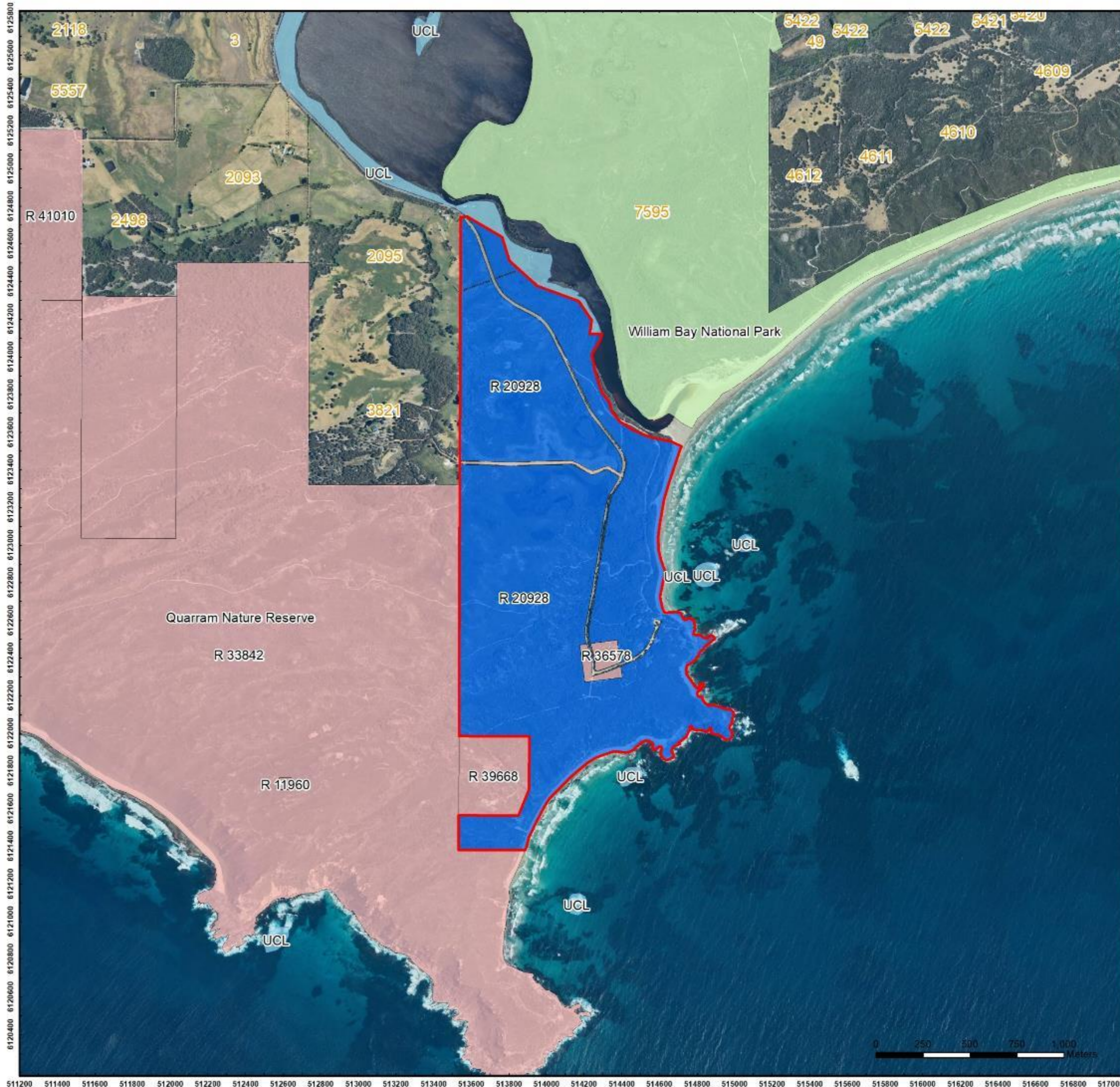
10 Appendices

Appendix A: Maps 1-12

- Map 1 – Land tenure
- Map 2 – Flora and fauna
- Map 3 – Hydrology
- Map 4 – Parry Beach Master Plan
- Map 5 – Day use area 1
- Map 6 – Day use area 2
- Map 7 Day use area 3
- Map 8 – Day use area 4
- Map 9 – Day use area 5
- Map 10 - Fishing Lease
- Map 11- Campsite area
- Map 12 – Access plan

The allocation of two protection zones is shown on the maps and are defined as:

1. **Conservation zones:** limit the development of infrastructure to safety and risk mitigation actions. Little to no development allocation in Conservation Zones, reduce clearing footprint and rehabilitation measures undertaken immediately after works.
2. **Coastal protection zones:** limit activity, reduce footprint and avoid fragile coastal barrier dunes.
3. **Recreation nodes:**
4. **Lease areas:**
5. **Access:** includes a hierarchy of public roads, 4WD tracks, EAW's, Emergency Access Routes (EAR) and management access.



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Overview Map Scale 1:250,000

Legend

- Subject Site
- Reserve_20928
- Cadastre - Freehold
- Quarram Nature Reserve_33842 DBCA
- William Bay National Park DBCA
- Unallocated Crown land - UCL



Scale
1:20,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
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Map 1 - Land Tenure

	QA Check KK	Drawn by SA
STATUS FINAL	FILE SOD008	DATE 9/06/2021



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Overview Map Scale 1:250,000

Legend

- Reserve_20928
- Cadastre
- TEC Boundaries
- WAHerb_parry**
- ▲ P2
- ▲ P3
- ▲ P4
- TPFL_parry**
- P3
- P4
- Fauna_parry**
- ★ EN
- ★ MI
- ★ P3
- ★ P4
- ★ VU
- Pre-European Vegetation**
- Sedgeland; reed swamps, occasionally with heath
- Shrublands; Acacia scrub-heath (unknown spp.)
- Shrublands; mixed heath



Scale
1:14,750 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Map 2 - Parry Reserve Flora and Fauna Base Map

	QA Check KK	Drawn by BM
STATUS DRAFT	FILE SOD008	DATE 17/06/2021



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Overview Map Scale 1:100,000

Legend

- Subject Site
- Cadastre
- ▶ Drainage Direction



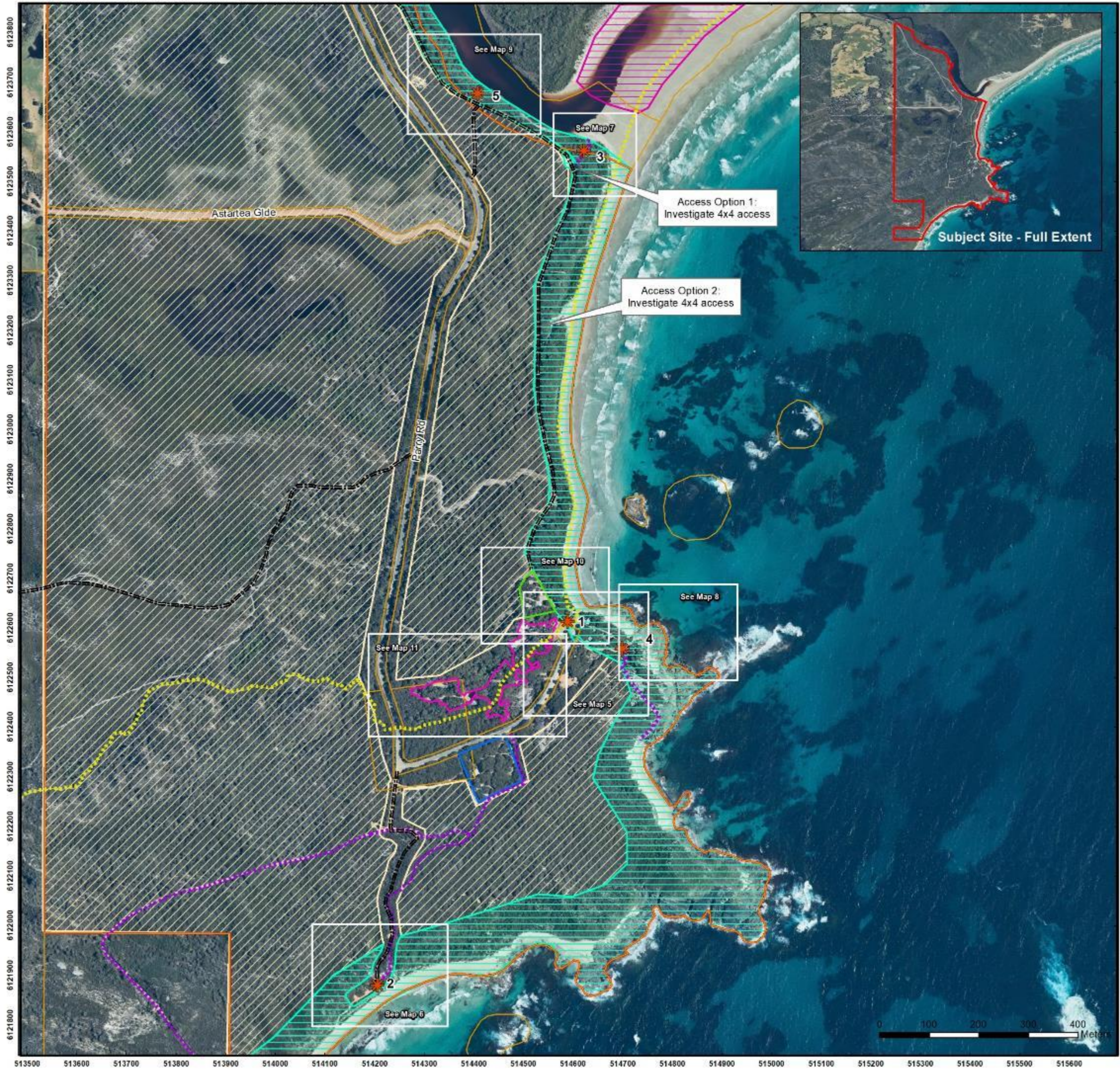
Scale
1:18,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Map 3 - Parry Beach Reserve Hydrology

	QA Check KK	Drawn by CC
STATUS FINAL	FILE SOD008	DATE 15/06/2021



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Overview Map Scale 1:250,000

- Legend**
- Subject Site
 - Denmark Boating and Angling Club Lease
 - Parry's Camp Site Lease
 - Fishermans Lease
 - Cadastre
 - ✱ Recreation Nodes (Site Numbers)
 - 4WD Track Only
 - Walk Trail
 - Bibbulmun Track
 - Conservation Zones
 - Coastal Protection Zone
 - Bird Conservation Zone

Scale
1:7,500 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Map 4 - Master Plan

	QA Check KK	Drawn by BM
STATUS DRAFT	FILE SOD008	DATE 28/06/2021



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Esperance Office:
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Overview Map Scale 1:250,000

Legend

- Subject Site
- Campground
- Cadastre
- Lease Area
- ✱ Recreation Nodes (Site Numbers)
- Bore
- ♿ Toilet
- i Visitor Information Area
- 2m Contours
- ➔ Walk and Bike Path (Point Hilliers Access)
- Investigate Day Use Parking
- Conservation Protection Zone
- Coastal Protection Zone



Scale
1:1,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Map 5 - Day Use Area #1

	QA Check KK	Drawn by BM
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Overview Map Scale 1:250,000

Legend

- Subject Site
- Cadastre
- ✱ Recreation Nodes (Site Numbers)
- ✕ Gate
- 2m Contours
- Walk Trail
- 4WD Track
- Emergency Access Way
- Investigate Day Use Parking
- Conservation Zones
- Coastal Protection Zone



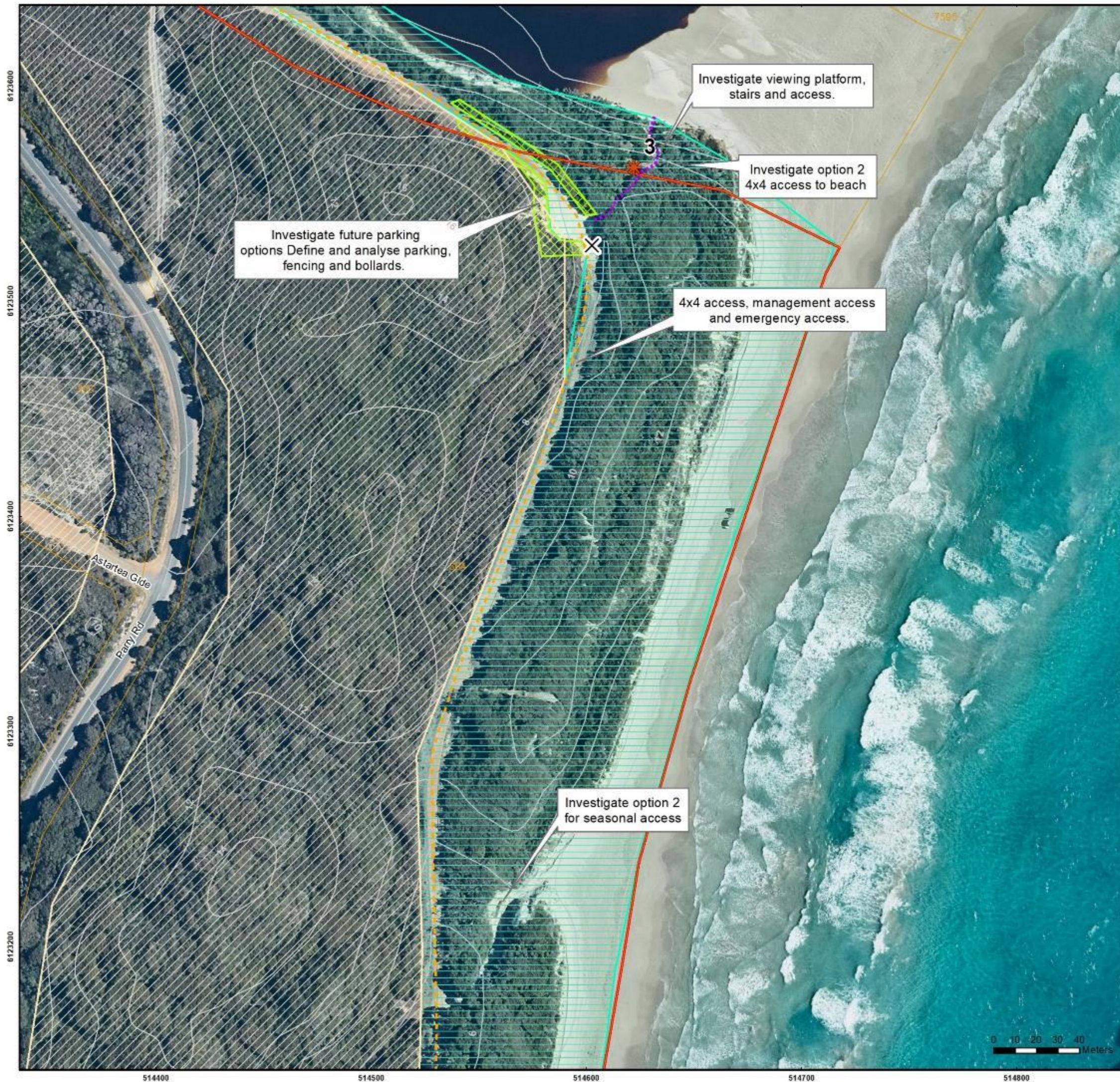
Scale
1:1,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
RIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Map 6 - Day Use Area #2

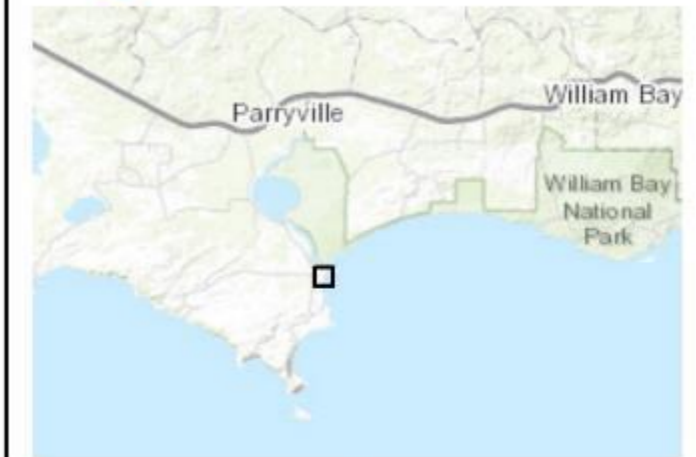
	QA Check KK	Drawn by BM
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Overview Map Scale 1:250,000

Legend

- Subject Site
- Cadastre
- ✱ Recreation Nodes (Site Numbers)
- ✕ Gate
- 2m Contours
- Walk Trail
- Emergency Access Way
- Investigate Day Use Parking
- Coastal Protection Zone
- Conservation Zones



Scale
1:1,750 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Map 7 - Day Use Area #3

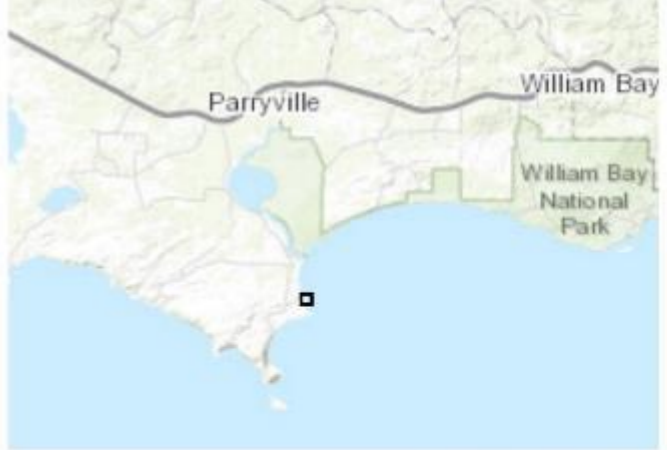
	QA Check KK	Drawn by BM
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Overview Map Scale 1:250,000

- Legend**
- Subject Site
 - Cadastre
 - ✱ Recreation Nodes (Site Numbers)
 - ✕ Gate
 - 2m Contours
 - ⋯ Walk Trail
 - Investigate Day Use Parking
 - Coastal Protection Zone
 - Conservation Protection Zone

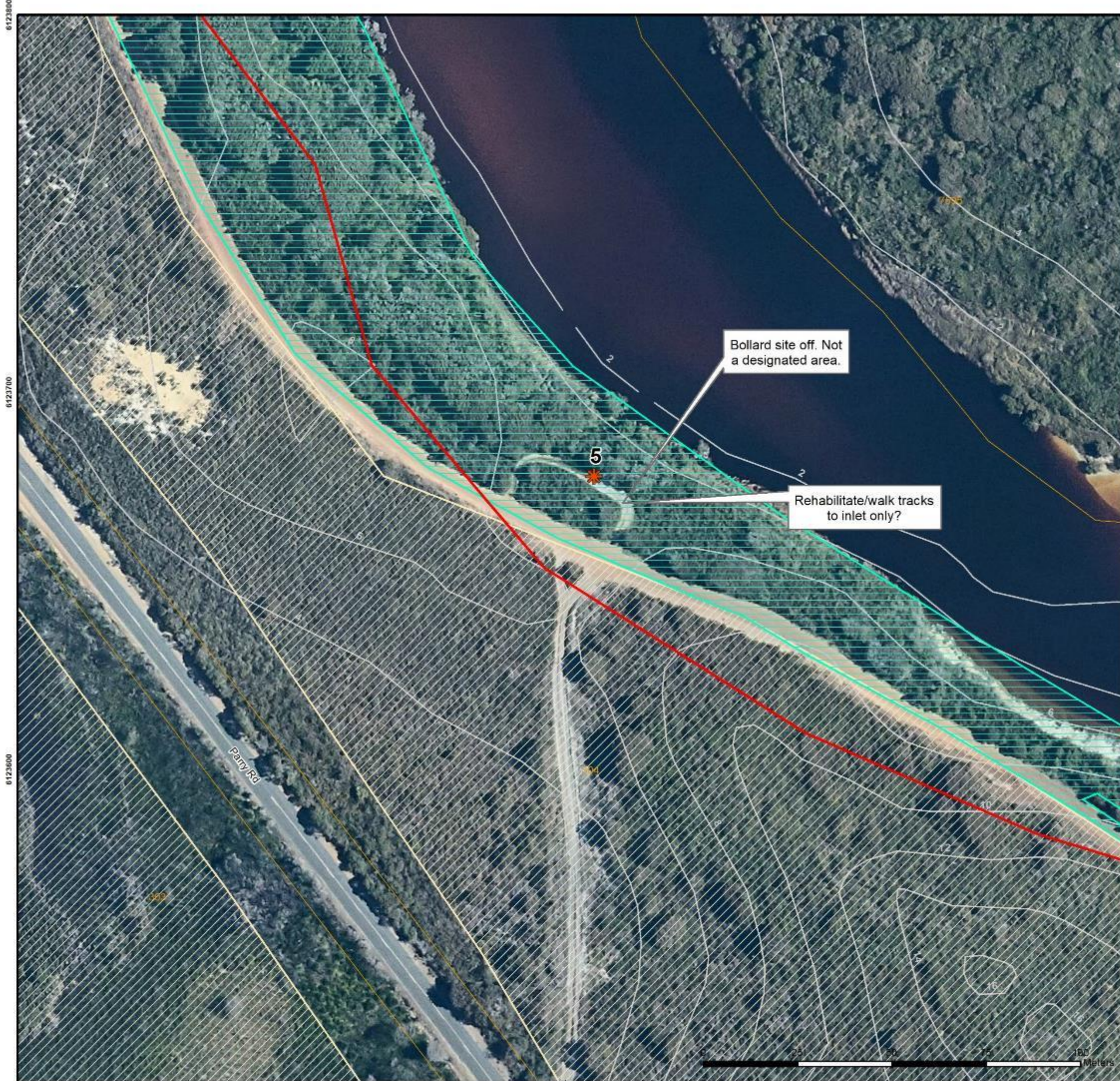
Scale
1:1,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Map 8 - Day Use Area #4

	QA Check KK	Drawn by BM
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 Esperance Office: 2A/113 Dempster Street Esperance, WA 6450



Overview Map Scale 1:250,000

Legend

- Subject Site
- Cadastre
- ★ Recreation Nodes (Site Numbers)
- 2m Contours
- Conservation Zones
- Coastal Protection Zone



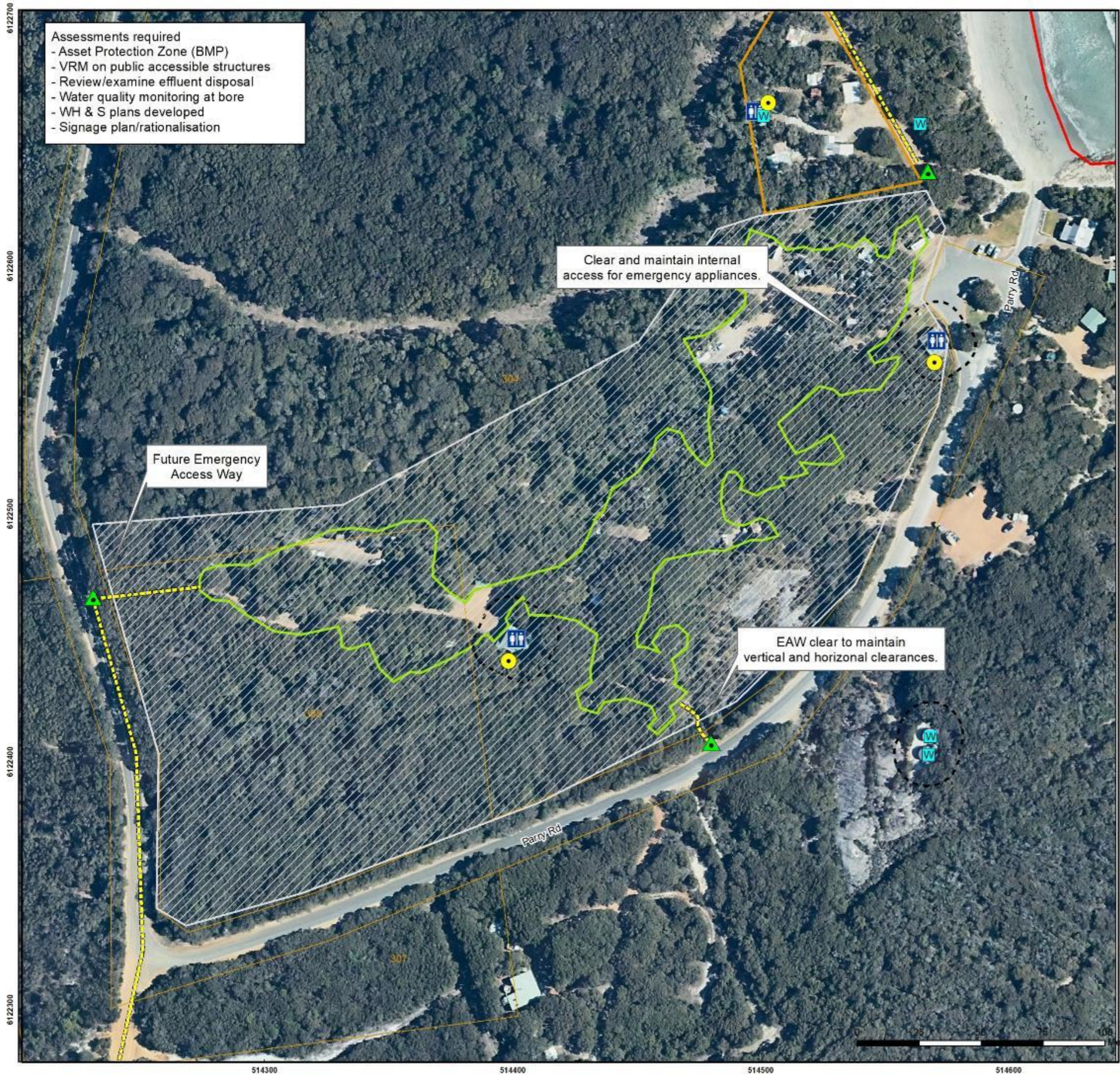
Scale
 1:1,000 @ A3
 GDA MGA 94 Zone 50

Data Sources
 Aerial Imagery: WA Now, Landgate Subscription Imagery
 Cadastre, Relief Contours and Roads: Landgate 2017
 IRIS Road Network: Main Roads Western Australia 2017
 Overview Map: World Topographic map service, ESRI 2012

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Map 9 - Day Use Area #5

	QA Check KK	Drawn by BM
STATUS DRAFT	FILE SOD008	DATE 14/09/2021



Assessments required

- Asset Protection Zone (BMP)
- VRM on public accessible structures
- Review/examine effluent disposal
- Water quality monitoring at bore
- WH & S plans developed
- Signage plan/rationalisation

Clear and maintain internal access for emergency appliances.


Future Emergency Access Way


EAW clear to maintain vertical and horizontal clearances.

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Esperance Office:
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Overview Map Scale 1:250,000

Legend

- Subject Site
- Camp Site
- Fishermans Lease
- Cadastre
- Access Points
- Effluent Disposal Point
- Water Point
- Toilet
- 2m Contours
- Emergency Access Way
- APZ
- Campground

 Scale
1:1,500 @ A3
GDA MGA 94 Zone 50

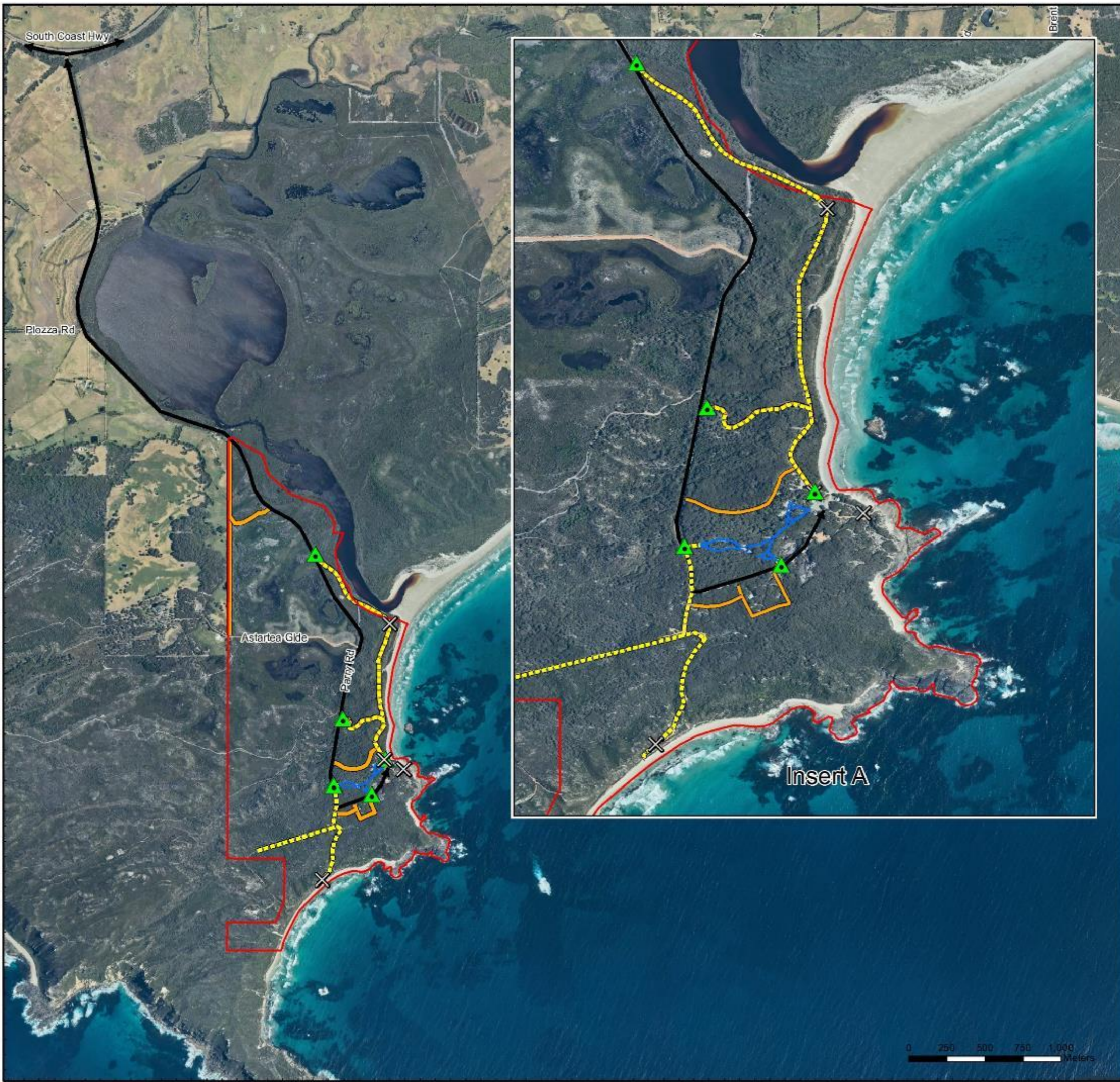
Data Sources
Aerial Imagery: WA Now; Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Map 11 - Parry's Campsite

	QA Check KK	Drawn by BM
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6120700612090061210061211006121200612130061214006121500612160061217006121800612190061220061221006122200612230061224006122500612260061227006122800612290061230061231006123200612330061234006123500612360061237006123800612390061240061241006124200612430061244006124500612460061247006124800612490061250061251006125200612530061254006125500612560061257006125800612590061260061261006126200612630061264006126500612660061267006126800612690061270061271006127200612730061274006127500



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Overview Map Scale 1:250,000

Legend

- Subject Site
- ▲ Access Points
- ✕ Gate
- Campsite_track
- Emergency Access Way (EAW)
- ↔ Emergency Access Routes (EAR)
- Firebreak MAF



Scale
1:25,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Map 12 - Access & Emergency

	QA Check KK	Drawn by BM
STATUS DRAFT	FILE SOD008	DATE 28/06/2021

512100 512300 512500 512700 512900 513100 513300 513500 513700 513900 514100 514300 514500 514700 514900 515100 515300 515500 515700 515900 516100 516300 516500 516700 516900 517100 517300 517500 517700 517900 518100 518300 518500 518700 518900 519100 519300