COASTAL RESERVES MANAGEMENT PLAN

MARCH 2024

landinsights
PLANNING DESIGN ENVIRONMENT

25 June 2024 - Attachment 9.5.1

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Document History:

Date	Document Revision	Document Manager	Summary of Document Revision	Client Delivered
Nov-23	0	MT	Initial draft	Nov-23
Dec-23	1	MT	Steering Group Comments included	Dec-23
Mar-24	2	MT	Final for Council Adoption	Mar-24

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1.0 introduction

1.1 BACKGROUND

The Shire of Denmark boasts an impressive 84-kilometre coastline along the Southern Ocean, offering diverse natural and recreational opportunities encompassing national parks, coastal reserves, beaches, and activities like fishing, surfing, and camping. However, the appeal of these coastal areas is coupled with management challenges, including erosion, pollution, climate change, invasive species, and escalating human impact.

Addressing these challenges, the Shire has been leading coastal management initiatives since 1987, establishing itself as a pioneer by being the first regional area in Western Australia to implement a coastal management plan. Subsequent updates in 2003 and 2011 were guided by the evolving needs and demands of coastal users and managers. This current Coastal Reserves Management Plan (CRMP) was identified as a necessary step from the extensive community consultation and Parry Beach Master Planning that was undertaken in 2021 and serves as the comprehensive ten-year update following the 2011 review.

The primary objective of this plan is to provide up to date information and strategic guidance for managing and enhancing the coastal reserves under the Shire's jurisdiction over the next decade. Based on current knowledge, stakeholder consultations, and additional coastal studies undertaken by the Shire since 2011, the plan addresses key aspects of each coastal reserve, including current uses, access, environmental conditions and rehabilitation measures, to provide ongoing management recommendations.

This plan pertains exclusively to Shire-managed land and excludes other areas under the jurisdiction of the Department of Biodiversity, Conservation, and Attractions (DBCA) and private landowners. Despite this confined scope the overarching aim of the study is to foster collaboration and coordination among all stakeholders involved in coastal management. This document is aligned with State policy, such as the Western Australian Planning Commission's State Coastal Planning Policy, to direct management on how to adapt to those dynamic and emerging issues and opportunities in coastal areas experiencing change.

This plan serves as a living document rather than a static guideline. It will be subject to periodic reviews and updates, ensuring its responsiveness to evolving coastal dynamics and pressures. This approach provides a crucial tool for the Shire, and can be used to secure grant funding and similar support for the implementation of proposed management actions.

The Shire of Denmark is committed to ensuring the long-term sustainability and resilience of its coastal reserves and invites the community and other partners to join the efforts to achieve this vision.

1.2 REVIEW PROCESS

The review of the CRMP involved consultation with the community and stakeholders; new State and Local policies; relevant literature; and site assessments to determine relevant actions.

The following broad steps were taken during the preparation of this document:

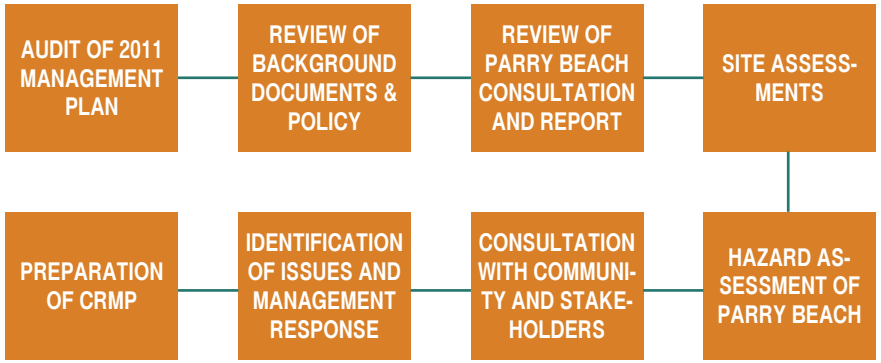


Figure 1.1 - CRMP Review Process

This CRMP identifies those specific actions needed, as well as their timing and responsibilities, to ensure the various assets and values identified by the community and stakeholders of this highly valued coastline are secured for the long term. The implementation section of this report provides further details regarding responsibilities, monitoring, timeframes and funding options.

1.3 STUDY AREA EXTENT

Situated approximately 420km south of Perth, the Shire of Denmark encompasses a significant portion of the southern coastline, predominantly housed within Conservation Reserves or National Parks under the management of the DBCA. In addition, there are Shire-managed coastal reserves, strategically positioned along that coastline, and which play a vital role facilitating many recreational activities, such as swimming, walking/hiking, surfing, and surf club training to fishing, camping, boating, dog exercising, and select professional pursuits such as seasonal salmon fishing and surfing school.

These reserves in addition to DBCA managed lands provide the community with a broader recreational opportunity spectrum.

The study area consists of four coastal reserves managed by the Shire. They are as follows:

- Ocean Beach Reserve (including Ocean Beach, Back Beach and Lights Beach) (R24913, R20578, and R24596)
- Parry Beach Reserve (R20928, R50244, R36578, R39668)
- Boat Harbour Reserve (R7723)
- Peaceful Bay Reserve (R24510).

The location of the Shire's coastal reserves in the local context can be seen in Figure 1.1.

- **Ocean Beach Reserve** (R24913, R20578, R24596 and 39727) commences at the outlet of the Wilson Inlet and comprises of Ocean Beach, Wilson Head (Sinker Bay Lookout, Black Hole Lookout, McGeary's Rock Lookout), Back Beach and Lights Beach. R24913 borders in the west at Lights Beach onto the William Bay National Park (Conservation Commission, DBCA managed estate). Ocean Beach is a popular tourist location and is used for a wide variety of recreational land uses as well as commercial (surfing school & kiosk) and club-based activities. Management recommendations of this document includes consideration of R20578 (Prawn Rock Channel reserve) within Ocean Beach reserve, as the activities and management issues of Prawn Rock Channel are continuous with the Ocean Beach recreational precinct.
    - The broader extent of Reserve (R24913) includes:
        - **Back Beach:** located to the west of Ocean Beach, approximately mid-way along the Ocean Beach Reserve coastline and faces the south-west. Access is provided via a track which is only accessible by 4WD vehicles due to its deep sandy nature. Pedestrian access to the beach is provided via a steep wooden pedestrian staircase from an internal parking area at the end of the access track. Back Beach is a popular location for fishing and surfing. It is linked via the Wilderness Ocean Walk ('WOW) trail (hiking and cycle trail) between Sinker Bay and Lights Beach.
        - **Lights Beach:** located west of Back Beach, bordering onto the William Bay National Park. Access to the beach is from Lights Beach Road, a road that has been bituminised within the last ten years. Lights Beach is a key coastal recreation node close to the Denmark townsite, that is used for fishing, swimming and dog exercise. Lights Beach is the western terminus of the WOW trail, but also has the Bibbulmun Track/Munda Biddi access which extends further to the west.
- **Parry Beach Reserve** (R20928, R50244, R36578, R39668) is located 25km west of Denmark and is situated in between William Bay National Park and Quarrum Nature Reserve. The main beach (Parry Beach) extends for approximately 1km from the outlet of Parry Inlet to the campground to the south. The Parry Beach Campground is a low-key, but very popular, camping ground located within the reserve. There are also professional fishing shacks within the reserve, along with a leasehold area for the Angling Club. This location is popular for surfing, walking, fishing and boating, and the camp ground is increasingly popular for nature-based camping, with visitor numbers exceeding 500 at peak season. The broader reserve also includes Hillier Beach, located to the south-west of Parry Beach.
- **Boat Harbour Reserve** (R7723) is located 30km to the west of Denmark and includes a 200m wide natural harbour. The reserve is surrounded by the Quarrum and

Owingup nature reserves which are managed by the DBCA. It can only be accessed by 4WD vehicles via a sand and gravel track. It is a popular location for fishing and picnicking.

- **Peaceful Bay Reserve** (R24510) is surrounded by the Walpole-Nornalup National Park, with freehold residential development and farmland along the north-western boundary. The reserve includes a caravan park located close to the beach and a leased area consisting of small holiday houses and retiree homes. The beach is a popular tourist destination and is used for fishing, swimming, boating, horse riding and general beach-going activities. Peaceful Bay Reserve has approximately 18 permanent residents residing under a lease arrangement within the reserve, which increases with short-stay visitors during peak seasons.

1.4 DOCUMENT STRUCTURE

The document provides a framework for the consideration of more detailed Actions for the Shire's coastal reserves. Coastal management considerations, combined with Shire-wide guiding principles provide a context for the site-specific actions. Actions are formulated after considering the range of issues at each site, community feedback, stakeholder comments, future demand analysis and Shire resources. The process of developing the CRMP is outlined in Figure 1.2 below.

Figure 1.2 - Development of the CRMP

1.5 AUDIT OF 2011 COASTAL RESERVES MANAGEMENT STRATEGY AND ACTION PLAN

This review process commenced with a comprehensive examination of the 2011 and informed the strategy to engage current stakeholders and community in consultation, to discuss on past, current, and emerging coastal management issues, and set possible updated direction for the management of coastal lands.

The audit found that the Shire had already completed many of the actions identified in the 2011 report, and that many ongoing management requirements had been planned for or met. In particular in the areas of higher use (for example Lights Beach, Prawn Rock Channel and Ocean Beach), and smaller nodes, these were being managed well with no requirement for a change of the applied approach. Some of the more remote and difficult to access sites however, such as Boat Harbour, still required additional and updated management action.

A summary of the audit is available from the Shire.

1.6 CONSULTATION MECHANISMS

A consultation program was undertaken to ascertain the current views of coastal users and to seek comment from relevant Government agencies. Specific consultation periods included:

- Beach-user questionnaire and invitation to provide written comments at the commencement of the project
- Seeking comments and input from relevant Government agencies and community groups to assist in identifying relevant issues and policy implications
- Individual meetings with key targeted stakeholders during May and September 2023
- Advertising the commencement of the Study, the availability of a beach-user questionnaire and an invitation to the community workshop locally and online
- A community workshop held in May 2023 at Denmark to obtain input to the coastal management plan
- Release of the draft plan for public comment
- Community Information (drop-in) sessions in Denmark where the community could seek clarification on the plan prior to making a formal submission or comment
- Feedback form and online feedback portal via the Shire's community engagement platform for submissions on the draft plan during the public comment period.

A summary of survey results is provided at Appendix A. Notes from individual meetings have been provided to the Shire under separate cover. The Shire has also received and released an Outcomes Report from the May community meeting.

1.7 COASTAL HAZARD RISK MANAGEMENT ADAPTATION PLAN

In 2018, the Shire completed a Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) for Ocean Beach and Peaceful Bay, two sites that were identified as coastal erosion hotspots in Assessment of Coastal Erosion Hotspots in Western Australia (Seashore Engineering, 2019).

The CHRMAP process involved assessing the coastal hazards, valuing the coastal assets, evaluating the risks, and developing short-term and long-term adaptation plans for both sites. The coastal hazard assessments followed the methodology of the State Planning Policy 2.6, which considers factors such as storm erosion, historic shoreline movement, future sea level rise, and inundation. The highest historical erosion rates were observed at Foul Bay, which is part of Peaceful Bay. Ocean Beach showed cycles of erosion and recovery, depending on the inlet dynamics. Planning allowances for erosion were established for 10, 50, and 100-year scenarios to assess the relative exposure of coastal assets.

The risk assessments identified some assets at both Ocean Beach and Peaceful Bay as "high risk", meaning that they require proactive monitoring and adaptation strategies to ensure their long-term resilience. The CHRMAP guidelines were used to explore adaptation options, including Avoid, Managed Retreat, Accommodate, and Protect. Managed retreat was considered as a viable option at some locations, which would involve relocating the infrastructure that is vulnerable to coastal erosion. Protection measures, such as maintaining timber retaining walls, were suggested for Ocean Beach, while accommodation strategies were recommended for beach access stairs and timber lookouts. The State has provided funding for implementing these measures.

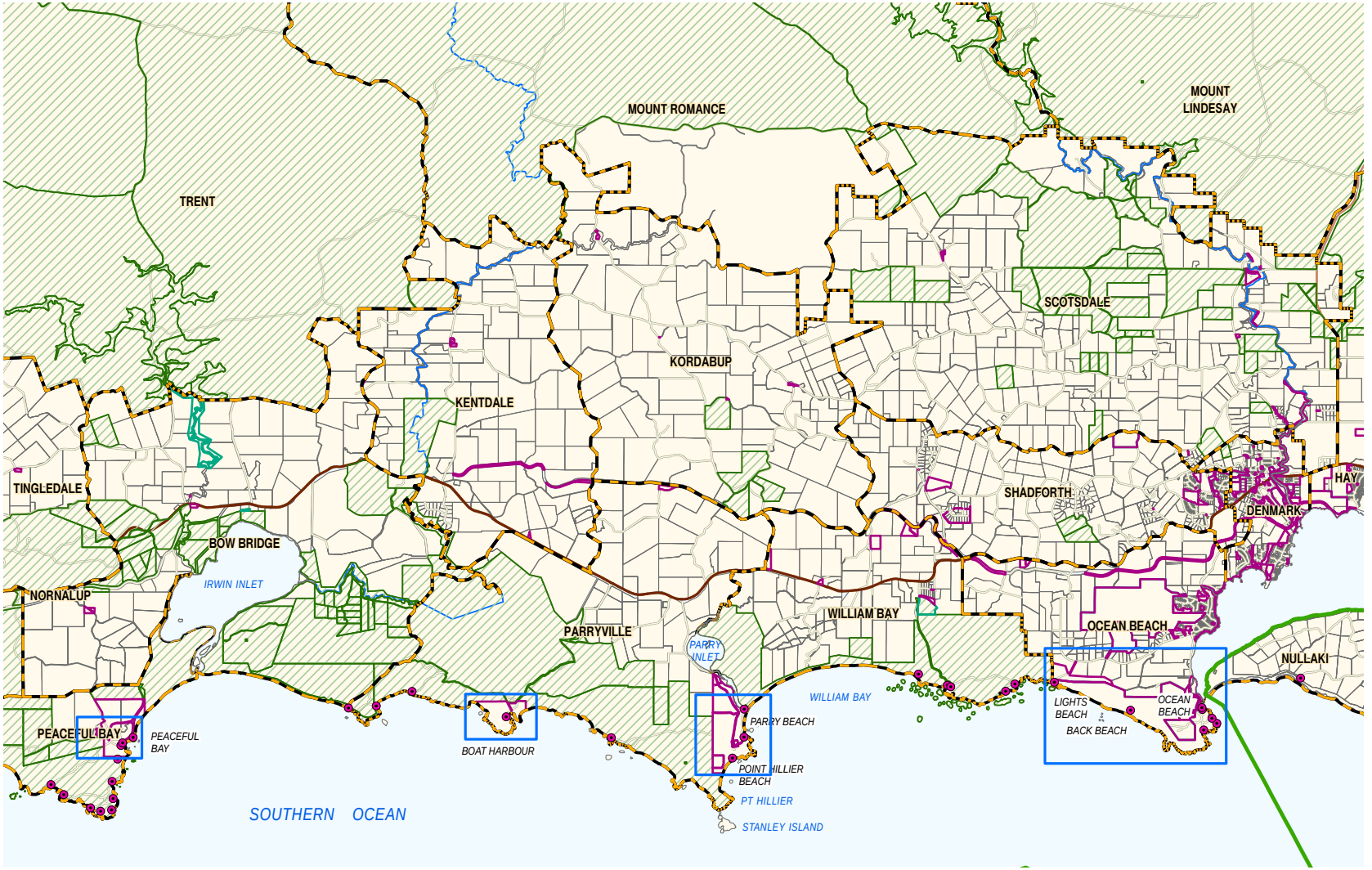
A 10-year program of works was developed to implement these strategies, which included

beach monitoring, geotechnical inspections, and various adaptation measures. These short-term actions were consistent with the 10-year concept plans that were prepared in collaboration with the CHRMAP Working Group. The plan also outlined strategies for the 100-year planning horizon, taking into account potential responses to future sea level rise. The Council officially adopted the CHRMAP report in April 2018.

PARRY BEACH

An assessment of coastal hazards has been completed in 2023 and this information is used to inform the CRMP. A copy is provided at Appendix B.

Picnic area at Parry Beach


MOUNT ROMANCE
MOUNT LINDESAY
TRENT
SCOTSDALE
KORDABUP
KENTDALE
TINGLEDALE
SHADFORTH
HAY
DENMARK
BOW BRIDGE
IRWIN INLET
NORNALUP
WILLIAM BAY
PARRYVILLE
PARRY INLET
OCEAN BEACH
NULLAKI
WILLIAM BAY
LIGHTS BEACH
OCEAN BEACH
BACK BEACH
PEACEFUL BAY
PEACEFUL BAY
BOAT HARBOUR
PARRY BEACH
POINT HILLIER BEACH
PT HILLIER
STANLEY ISLAND
SOUTHERN OCEAN
Beach
River and waterways
Shire of Denmark
Localities
Cadastre
DBCA Managed Land
Shire of Denmark Reserve
Other Reserves
Roads
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Plan 1.1
Study Area
SHIRE OF DENMARK
Layout Name: SD 1118-001-01-02 Study Area

2.0 management considerations

This section outlines key management considerations that relate to the entire Shire of Denmark coastline, and coastal areas around WA more broadly. They have been identified from comments received from community consultation, key stakeholder meetings, discussions with the Shire, a review of literature and from site visits. The following section elaborates the issue and reason for concern in general noting where and if it occurs within the study area. Consideration of these issues is addressed in more detail throughout the document and will form the basis for the management responses proposed.

2.1 COASTAL TENURE AND OWNERSHIP

Coastal tenure across the State is diverse. Some areas are managed by local government, while others are managed by various state agencies for specific purposes. There are also extensive areas of Unallocated Crown Land (UCL) that are generally not actively managed. This fragmentation of tenure can reduce the effectiveness of broad coastal management across an area without a coordinated multi-agency approach. Within the Shire of Denmark, coastal areas are mainly managed by either the Shire or the State (via DBCA).

2.2 COASTAL HAZARDS

State Planning Policy 2.6 – State Coastal Planning Policy provides a policy context for management of coastal areas around the State. The policy was updated in 2013 following its introduction in 2003. Section 5.5 of the policy refers to the need for the responsible management authority (in this instance the Shire of Denmark) needing to undertake coastal hazard risk management and adaptation planning. In response to this the Shire has undertaken a separate process of preparing a Coastal Hazard Risk Management and Adaptation Plan for Ocean Beach and Peaceful Bay, and consideration of coastal hazards for Parry Beach has been undertaken as part of this review process. Geotechnical surveys have also been undertaken for Ocean Beach in 2019 and for Parry Beach and Peaceful Bay in collaboration with Department of Transport in 2023.

2.3 ENVIRONMENTAL MANAGEMENT

Coastal environments are fragile and susceptible to damage from uncontrolled use and access. Degradation to the environment negatively impacts the natural beauty valued by the community in these areas. It is important to ensure recreational land uses are managed to reduce and mitigate environmental degradation.

Environmental degradation through uncontrolled access and vegetation destruction is not a significant issue within the Shire. Nevertheless, uncontrolled access, dune degradation and removal of vegetation should be discouraged and prevented where possible.

The coastal shores of the Shire provide important breeding/nesting locations for a variety of endangered seabirds and beach-nesting shorebirds, including the Hooded Plover Red-capped Plover and Sooty Oystercatchers. Key nesting times and locations are well known, and committed community members seek to ensure that the nesting birds are protected at appropriate locations. The CRMP will provide guiding principles for the ongoing management of this issue.

2.4 ACCESS

Coastal access includes provision and maintenance of both vehicle and pedestrian access. It is important that access to the coast is provided (where appropriate) for professional and recreational pursuits. However, this needs to be balanced with the environmental protection of dunes and vegetation. Having more than one access track leading to and from the same site can lead to degradation of the dunes, which can eventually lead to erosion and dune blowouts. This can be a particular issue during peak/busy times.

Most vehicle access tracks along the Shire's coastline are well established however, and duplicate or additional tracks are not currently an issue (with the exception of the access to Boat Harbour). Uncontrolled access and duplicate tracks should be discouraged where possible and sensitive areas appropriately sign-posted.

Pedestrian access to the coast is best provided at discrete locations, and can be designed (for instance with the use of boardwalks) to keep the interaction between pedestrians and the dunes to a minimum. This access design also allows parking to be established away from fragile areas.

2.5 4WDS AND OFF-ROAD VEHICLES

There are two types of vehicles that drive on the beach, Road Registered Vehicles (RRV) and Off-Road Vehicles (ORV). RRVs are licensed road vehicles which can be used off road but are usually used for transit purposes in rural or town areas. ORVs however are unlicensed (recreational) vehicles which can be used off road in rough terrain (such as quad bikes, dune buggies etc.).

The *Control of Vehicles (Off Road Areas) Act 1978* applies to land owned by the State of WA and areas designated by Local Government Local Laws and for off road vehicles (unregistered) only. Registered Road Vehicles however are managed under the *Road Traffic Act 1974* and Local Government Local Laws.

There are no official 'off-road areas' located in the Shire however a 4WD is required to access some beaches. The uncontrolled future use of ORV may cause greater risk to sensitive areas.

Environmental damage occurs when vehicles are driven over the dunes and through vegetation without following designated or existing tracks. This damage over time leads to erosion and dune blowouts. The issue is exacerbated when drivers leave their tyres at full pressure or when new or multiple tracks are created. The management of vehicle use within coastal areas can be challenging, particularly when driver behaviour differs. The Shire has promoted a responsible Code of the Coast including installation of signage and distribution of educational materials in collaboration with other local agencies to encourage more responsible 4WDing and use of coastal environs along the south coast region. Other issues include the spread of dieback, disturbance to heritage sites and safety risks where other beach users are present. It is important that tracks are rationalised, drivers are educated, and vehicle tracks avoid Aboriginal cultural heritage sites and historic heritage places.

ORV use does not seem to be a particular issue in the Shire of Denmark. Many of the ORV tracks are well established and uncontrolled access is not common, however there are some locations where tracks are not managed well, such as Boat Harbour.

2.6 POPULATION GROWTH AND TOURISM DEMAND

Population growth and improved access to coastal sites can lead to increased visitor numbers and overnight stays. This in turn leads to greater demand for facilities, improved access, and a need for more active management. This CRMP acknowledges that the population of the Shire is expected to continue to increase over time, and that tourism pressure will also likely increase. The Shire will, via the actions in this CRMP, have suitable tools and guidance to adapt to management issues as they arise.

2.7 PROVISION OF FACILITIES

Facilities are usually provided at coastal sites where demand pressure warrants this provision. The types of facilities depend on the land use, but they generally relate to camping/caravanning and day use amenities such as shelters, picnic benches, BBQ areas, toilets, rubbish bins, wastewater dump points, etc. are common at coastal sites, and their location depends on local demand and cost or provision and operation.

Camping/caravanning is a popular activity in the Shire, particularly during peak holiday periods. There are several options for camping/caravans around the coast, including Parry Beach and several privately run caravan parks. There are often pressures however with illegal camping at various locations around the coast.

Discussions with key stakeholders suggest regularly managed sites such as Lights Beach with good access and facilities, are an effective strategy to discourage and therefore reduce the impact of uncontrolled camping and environmental degradation.

2.8 LANDSCAPE

It is important that current and future land uses do not negatively impact on the visual landscape and amenity. The aim of the 2010-2020 Strategy and Action Plan was to propose actions which have minimal impact on visual amenity and landscape and to thereby enhance opportunities for the landscape to be viewed and appreciated. This aim is carried over.

2.9 HERITAGE

Coastal management will need to have regard for Aboriginal Cultural Heritage Sites and Historic Heritage Places identified by the Department of Planning, Lands and Heritage.

Registered Aboriginal Heritage Sites have been identified at various locations around the coast. There may be other non-registered Aboriginal Heritage Sites in the study area which can be identified through an Aboriginal heritage survey (if required). In addition, there are several sites identified on the Shire's Local Heritage List.

2.10 COMMUNITY INVOLVEMENT

There is a need to facilitate ongoing community involvement in coastal management, particularly to involve coastal landowners as well as user groups and community groups with an interest in coastal management issues. Involvement of the local community in coastal management will grow a sense of ownership and care for the coast and to act with a protective motivation.

The Shire is encouraged to engage with its knowledgeable community, with several community groups taking an active role in managing and elements of the coast. The Shire has, and will continue, to support these groups in ongoing formal or informal partnerships.

Coastal Planning Workshop, Denmark, 2023

3.0 vision, objectives and management principles

3.1 VISION AND OBJECTIVES

The vision for the Shire's coastal areas is

> ***to strategically maintain the distinctive social, environmental, and economic resources within the study area, appropriately managing potential risks posed by coastal hazards, sea level fluctuations, bushfires, and land degradation.***

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

- **Objective 1** – Identify current land uses, values and issues of the Shire's coastal land, which may impact upon coastal management for the next 10 years.
- **Objective 2** – To manage the environmental and recreational values of the coastline in order to retain the broad range of recreational opportunities, environmental values and sense of isolation unique to the area.
- **Objective 3** – Evaluate the risks, actions and recommendations from existing Shire plans and strategies and develop strategies to mitigate risks or implement actions that align with the vision of this plan.
- **Objective 4** – To ensure management and protection of the Shire's coastline is undertaken in a sustainable manner.
- **Objective 5** – To ensure adequate consideration of coastal hazards is undertaken and ensure management is undertaken in accordance with SPP 2.6 and associated guidelines.
- **Objective 6** – To adequately consider future urban growth and tourism and the effects (both positive and negative) this may have on recreational use of the study area.
- **Objective 7** – To retain, protect and enhance areas of historic value, places of cultural heritage significance within the study area.
- **Objective 8** – To increase community awareness and participation in coastal management and maintain successful relationships between stakeholders and coastal users.
- **Objective 9** – Provide an implementation plan that identifies management actions and sets priorities.

3.2 MANAGEMENT PRINCIPLE – CONSERVATION

- Sustain and enhance the integrity of terrestrial and marine ecosystems through ongoing maintenance and restoration efforts.
- Implement continuous rehabilitation initiatives, including re-vegetation, weed control, and erosion management, targeting dune areas displaying evidence of disturbance.
- Initiate weed control and re-vegetation projects in accordance with the action plan, focusing on identified areas for intervention.
- Promote the enduring protection of dune ecosystems by advocating the use of formal access ways among beach users, safeguarding vegetation from human-induced disturbances.
- Prioritise the minimisation of soil disturbance during the implementation and maintenance phases of facilities and infrastructure projects.
- Pro-actively address erosion concerns by closing informal tracks, advocating for formal pathway usage, and actively rehabilitating and maintaining dune vegetation.
- Regulate off-road/4WD vehicle access along the beach to prevent any compromise to environmental values.
- Engage in educational initiatives targeting the local community and visitors, emphasising environmental respect and the minimisation of impacts for sustained enjoyment in the future.

3.3 MANAGEMENT PRINCIPLE – RECREATION

- Acknowledge the significance of recreational land uses as a primary value of the Shire's coastal reserves.
- Provide suitable facilities catering to a diverse range of recreational activities within each reserve, striving for universal accessibility where feasible.
- Safeguard the safety and quality of recreational activities in the Shire's coastal reserves, aligning with the social and natural values inherent to each location.
- Foster the development of new tourism opportunities where appropriate, ensuring alignment with the social and natural values of each reserve.
- Anticipate potential expansions in the Peaceful Bay residential area, increased visitor numbers during peak periods, and an increase in coastal recreational use in the short term.
- Minimise environmental impact by ensuring public access to the coast is conducted with utmost care.
- Confirm adequacy of pedestrian access to the beach at each reserve, avoiding new paths to preserve dunes and vegetation.
- Validate the suitability of restricted vehicle access along Ocean Beach, considering the potential need for additional restrictions on other popular swimming beaches and during shorebird nesting/breeding times.
- Install interpretative signs strategically in specific locations to enhance public education on indigenous heritage and the environment, ensuring design and placement contribute positively to the landscape and aesthetics.

3.4 MANAGEMENT PRINCIPLE – COMMUNITY USE

- Recognise the importance of the beach and landscape to the Noongar people.
- Acknowledge the significance of community ownership of the beach and coastal reserves, fostering a culture of respect for general safety and environmental care.
- Actively promote increased local engagement in coastal planning, management, and monitoring.
- Sustain ongoing opportunities for community involvement in beach environmental management, encompassing activities such as weed control, vegetation surveys, fauna spotting, and reporting vandalism and damage, providing first-hand experiences with the natural environment.
- Acknowledge the financial constraints of the Shire of Denmark, allowing for prioritisation of actions that demand heightened attention.

3.5 MANAGEMENT PRINCIPLE – COLLABORATION

- Acknowledge the deep connection the Denmark community has with the coast and the valuable contributions of community volunteers in aiding coastal management efforts.
- Foster collaboration with volunteer and management groups, offering support for their activities whenever feasible and aligned with the overarching objectives of this CRMP.
- Explore the possibility of establishing formal Memoranda of Understanding with volunteer or other management groups, facilitating the seamless implementation of actions outlined in this CRMP.

3.6 STRATEGY AND ACTION PRIORITIES

- The priority of each action is determined by the feedback from the stakeholders and the community, which indicated the issues and concerns that were high priority for them and should be addressed in the short to medium term, as well as the costs and the complexity of each action.
- The actions with responsibilities assigned to the Shire are categorised into four priority levels:
  - Short priority: These are the actions that are expected to be completed within the next 2 years, either through the Shire annual budget or through grant funded projects.
  - Medium priority: These are the actions that are expected to be completed within the next 5 years, depending on the availability of funds and resources.
  - Long-term priority: These are the actions that are expected to be completed in more than 5 years, as they require more planning and coordination.
  - O: Ongoing – over life of the CRMP as required.

4.0 management strategies

4.1 TENURE

LOCAL PLANNING SCHEME

The Shire's Local Planning Scheme reserves the majority of the sites within this CRMP for Parks and Recreation. The exceptions are the small island opposite Prawn Rock Channel, which is reserved for Drainage and Waterbodies, and the Boat Harbour, which is reserved for Public Use (without any use designation). The scheme is silent on the purpose and objectives for these reserves. Some consideration could be given to reserving all coastal areas for Parks and Recreation as part of a future omnibus amendment. This would clarify the intent and objectives of these areas more clearly. Any amendment should be consistent with Clause 14 of the Model Provisions for Planning Schemes in the Planning and Development (Local Planning Schemes) Regulations 2015, namely regarding the objectives for local reserves.

TENURE

All areas considered within this CRMP are contained within reserves which have their management orders with the Shire of Denmark. The purpose and responsibility of each reserve is described in more detail in Table 4.1 below. (Note that these reserve details, along with their purposes, refer to tenure are different in context to Local Planning Scheme (zoning) reserves). Many of these reserves were created many years ago, and the boundaries do not reflect current on-ground land use patterns. Furthermore, many of the recorded reserve 'purposes' do not reflect current (or currently desired) use.

Table 4.1 - Reserve details

Reserve Details	Description
Ocean Beach Reserve – 24913 (Lot 7625 on P216756)	The total area of this reserve is 545ha and is classified as a Class 'A' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Parklands and Recreation.
Ocean Beach Reserve – 20578 (Lots 8234 and 8235 on P35326)	The total area of this reserve is 13ha and is classified as a Class 'C' reserve. The reserve is located at the north-east end of the Ocean Beach Reserve Study Area and includes two small parcels of land near the opening of the Wilson Inlet. The management orders are with the Shire of Denmark and the current purpose is listed as Camping.
Ocean Beach Reserve – 24596 (Lot 6119 on P164260)	This reserve includes a very small area of land (0.06ha) along Ocean Beach Road near the Wilson Inlet. It is classified as a Class 'C' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Recreation.
Ocean Beach Reserve – 39727 (Lot 7622 on P14650)	This reserve borders the northern boundary of R24913 at the western end of the study area. The management orders are with the Shire of Denmark and the land use is listed as Public Recreation. The reserve is 56.45 ha in size and includes the access road to Lights Beach.
Parry Beach Reserve – 20928 (Lots 303 and 304 on P49014)	This reserve is 205ha and is also classified as a Class 'A' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Camping and Recreation.
Parry Beach Reserve – 50244 (Lots 305 and 306 on P49014)	This reserve is 0.1ha in size and is a long strip of land located at the northern end of the Parry Beach Reserve Study Area branching either side from Parry Road. It is classified as a Class 'C' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Drainage.

Reserve Details	Description
Parry Beach Reserve – 36578 (Lots 307 and 308 on P49014)	This reserve is 3.3ha and is also classified as a Class 'C' reserve. It is located at the southern end along Parry Road. The management orders are with the Shire of Denmark and the current purpose is listed as Caravan Park.
Parry Beach Reserve – 39668 (Lot 7553 on P186775)	This reserve is 15ha and is located at the southern end of the Parry Beach Reserve Study Area, to the west of Hillier Beach. It is classified as a Class 'C' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Quarry Site.
Boat Harbour Reserve – 7723 (Lot 7594 on P91575)	Boat Harbour Reserve is the smallest study area at 59ha and is classified as a Class 'C' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Recreation and Foreshore Protection. This vesting order term expired on 30 April 2012.
Peaceful Bay Reserve – 24510 (Lots 1423, 1424, 2229 on P240012)	The Peaceful Bay Reserve Study Area consists of a number of small lots which combine into the one reserve. A majority of the recreational land uses are contained on Lot 2229 which is approximately 83ha in size. The entire reserve is classified as a Class 'A' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Recreation, camping caravan park and holiday cottages.

Table 4.2 – Strategies – Tenure

Strategy #	Description	Priority	Responsibility
Relevant Objectives: • Objective 1 – Identify current land uses, values and issues of the Shire's coastal land which may impact upon coastal management for the next 10 years. • Objective 3 - Consider risks, actions and recommendations from existing Shire plans and strategies. • Objective 6 – To adequately consider future urban growth and tourism and the effects this may have on recreational use of the study area.			
TEN1	Merge coastal reserves when appropriate, to ensure boundaries reflect on-ground land use, and reserve purposes are accurate.	S-M	Shire of Denmark
TEN2	Where appropriate, designate existing access points as road reserves so these are identified as road reserves and maintained as such.	M-L	Shire of Denmark
TEN3	Update the Shire's Local Planning Framework to include reference to coastal management where appropriate, ensuring that existing public access to beach/foreshores is maintained, appropriate coastal setbacks are implemented (taking into account any geotechnical surveys undertaken), and appropriate development controls are in place. Consider including Boat Harbour in a Parks and Recreation Reserve.	O	Shire of Denmark
TEN4	Ensure universal access and inclusion planning is considered when designing and implementing the actions recommended in this Strategy and that the Shire's Disability Access and Inclusion Plan is referred to.	O	Shire of Denmark

4.2 HERITAGE

The heritage related to the Shire's coastal reserves includes both Aboriginal and European settlement which has influenced the current land use and development in the area.

ABORIGINAL CULTURE

There is evidence that Aboriginal people have inhabited the south-west of Western Australia for at least 38 000 years. At the time of European settlement, the south-west was occupied by a semi-sedentary Aboriginal population of several similar tribal groups, known collectively as Noongar (also spelled Nyungar) or Bibbulmun (also spelled Pibulmun) people (Goode and Irvine 2006).

It is known that the Wilson Inlet historically formed a focal point for the Noongar people who managed and utilised the Inlet and its abundant natural resources (Green Skills, 2008; Mitchell, 2008). There's an extensive range of archaeological evidence in and around the Inlet to support its use for a variety of cultural activities and for resource acquisition (Green Skills, 2008). The Wilson Inlet Cultural Management Plan 2008 (authored by Myles Mitchell) was developed by State Government Agencies and South Coast NRM Inc. to assess the Noongar cultural values associated with the Wilson Inlet, and guide culturally sensitive management of the Wilson Inlet in the future.

The Department of Planning, Lands and Heritage (DPLH) provides mapping to show the location of identified Aboriginal sites and related information. Details of these sites are provided in Table 4.3 – Aboriginal Heritage below.

Table 4.3 – Aboriginal Heritage

Location	Site Name	Site Type
Ocean Beach	Katelysia Rock Shelter	Artefacts / Scatter, Midden / Scatter
Lights Beach	Lights Beach	Artefacts / Scatter
Boat Harbour Reserve	Boat Harbour	Artefacts / Scatter
Peaceful Bay Reserve	Point Irwin Quarry	Quarry, Artefacts/Scatter
Peaceful Bay Reserve	Little Groper Rock	Grinding patches/grooves
Peaceful Bay Reserve	Point Irwin 1	Grinding patches/grooves
Peaceful Bay Reserve	Point Irwin 2	Grinding patches/grooves
Peaceful Bay Reserve	Nornalup National Park	Artefacts / Scatter
Peaceful Bay Reserve	Peaceful Bay 01	Artefacts / Scatter

Source: DPLH Database Search.

Development that has the potential to impact on any Aboriginal heritage site (whether discovered or not) is currently governed by the *Aboriginal Heritage Act 1972*. It is suggested that ethnographic and archaeological surveys are undertaken prior to any development to ensure that the provisions of the Act are not breached, and that appropriate and respectful consultation with traditional owners is undertaken.

It is recommended that some form of educational information is provided at each coastal reserve to make visitors aware of the specific Indigenous values of the area (e.g. interpretative signage) where deemed appropriate, taking into consideration cultural sensitivities. Consultation with traditional landowners is recommended during the design and implementation of any educational information or signage.

EUROPEAN CULTURE

European discovery of the south coast took place in 1622 when the Dutch ship called the 'Leeuwin' travelled past this region. The town of Denmark was established in the 1880's during the establishment of the timber industry which was fuelled by the farming potential between York and Albany, the Kalgoorlie gold rush and new railway lines which were under construction in the broader region. The establishment of the railway line further supported economic development in the region through the improvement of transport of goods.

The decrease in timber in the early 1900's meant that many early settlers left the region in search of alternate employment. Land was sold cheaply and the steady flow of migrants from Great Britain saw the development of vegetables, fruit and dairy farming. The Group Settlement Scheme of the 1920's created a 'boom' period for Denmark and brought the establishment of schools, roads, and bridges. During the 1940's the government settled

many ex-servicemen on farms in the district which resulted in further population growth (Riney et al., 1987).

Tourism also gradually developed during the 1940's and 50's. Prawn Rock Channel and Ocean Beach were popular holiday spots during this time. These areas were mainly visited during the summer months for camping and fishing purposes. Reserve 20578 at Prawn Rock Channel was used for camping on either side of the road and other conveniences were also present such as tea rooms, a general store and picnic facilities (Green Skills, 2008). The sandbar at Prawn Rock Channel was also used for water sports activities 30-40 years ago.

Parry Beach and Peaceful Bay have historically been the terminus of South Coast stock droving routes and these routes may be formalised in the future as horse riding trails. These stock routes were established during the settlement of Peaceful Bay and to access areas around the Irwin and Parry Inlets.

The Shire's Heritage List contains three relevant records. One place is listed within Peaceful Bay Reserve as *Peaceful Bay Settlement – Original* (on the local heritage list). It has the following description:

> *The settlement comprises 163 informal vernacular style holiday cottages on compact blocks with no fencing but separated by native peppermint trees and narrow gravel grid style lanes. The cottages are predominantly of timber and fibrous cement construction and were constructed at low cost using basic materials. The individual low-key elements of the precinct, its original layout, siting amongst lawns and shady trees and remote bushland setting help to create a distinctive informal character.*

The construction date is listed as 1950 and the historic themes are listed as demographic settlement and mobility, social and civic activities (sport, recreation and entertainment), outside influences (tourism) and people (innovators). The site is located slightly inland and to the west of the coastal/beach area (i.e. the current 'village' of Peaceful Bay).

The Shire of Denmark Heritage List also includes Parry's Beach Settlement (as nominated by the PBVMG). Buildings included on the heritage site include the caretaker's cottage, the camping site, the net shed and two other cottages. The caretaker's cottage is described as a small cottage reminiscent of the fishing shacks that were used in past times by commercial fishermen during the salmon season. About 100m away, screened from view, are a collection of other buildings, the remnants of a once larger settlement of fishing shacks. A timber building is the original boatshed, and two other shacks are all that remain of the original settlement.

Wilson Inlet, which encompasses Prawn Rock Channel, is also included on the Shire's Heritage List. The associated record states that its importance relates to the inlet being a focus point for Noongar People, along with its environmental values, particular for birds.

Table 4.4 – Strategies - Heritage

Strategy #	Description	Priority	Responsibility
Relevant Objective: • Objective 1 – Identify current land uses, values and issues of the Shire's coastal land which may impact upon coastal management for the next 10 years. • Objective 7 – To retain, protect and enhance areas of historic value and places of cultural heritage significance within the study area			
H1	Continue to liaise with local Aboriginal representatives to ensure a culturally sensitive approach to recreational activities and the provision of visitor amenities within the study area.	O	Shire of Denmark, DPLH, Local Aboriginal People
H2	Encourage involvement of Aboriginal persons in coastal management through engagement, consultation and volunteering where possible.	O	Shire of Denmark, DPLH, Local Aboriginal People

Strategy #	Description	Priority	Responsibility
H3	Consult with relevant Aboriginal Liaison people to ensure appropriate recognition and protection is given to relevant heritage sites.	O	Shire of Denmark, DPLH, Local Aboriginal People
H4	Establish interpretative signage at culturally/ historically significant sites.		Shire of Denmark, DPLH, Local Aboriginal People

4.3 COMMUNITY INVOLVEMENT

COASTAL EDUCATION AND AWARENESS

Community engagement is essential for effective coastal management, as it creates a sense of shared ownership, and shared responsibility. Educating and involving the community in coastal management can contribute to an enhanced understanding of the coastal environment, and subsequently promote positive behavioural change at the community level. The Shire has commenced work in this area already, with the release of information such as 'Code Off-Road'.

To enhance public awareness and understanding of coastal issues, several options can be explored; for example:

- Supporting community-involved initiatives like beach clean-up days and school participation programs can be instrumental in raising awareness. T
- Coastal Training Programs, featuring short courses on coastal management conducted through training organisations, presents an opportunity to educate a wider audience on coastal issues and management practices.
- The implementation of a Coastal Community Support Program is recommended, designed to encourage and support voluntary individuals and groups actively involved in the management of coastal areas.

COASTAL INFORMATION

Coastal user demographics are useful for assessing the level of use and the potential impacts on the coast. The Shire should continue monitor visitor numbers and experiences at its managed sites and obtain similar data from DBCA if possible, including to continue the use of traffic data-loggers at key locations. It should also survey coastal users to learn about their expectations and experiences. Over time, this will help the Shire and other land managers plan for the visitor demand, provide adequate facilities, and make informed decisions about coastal management.

FIRE MANAGEMENT

Fire is a natural phenomenon in the South Coast Region which is largely caused or influenced by summer droughts and lightning storms. It was used deliberately by Aboriginal people prior to European settlement, mainly to assist in hunting practises and for sanitation purposes.

The Shire of Denmark has an active Local Emergency Management Committee (LEMC) which consists of Councillors and staff from the Shire, staff from the Police Service, DEC, Department of Health, DFES and local businesses together with volunteers from St John Ambulance, Red Cross, Fire and Rescue Service, SES and Bush Fire Brigades. The LEMC provides support to organisations in the Shire to help prevent some emergencies from occurring and to best prepare in the event of an emergency.

It is advisable that the Shire and LEMC continue to liaise with the DBCA regarding the control of bushfires on local reserves, and also in relation to prescribed burning and fuel reduction techniques and management.

The frequency of fire may also be a determining factor for biodiversity values in coastal reserves and may differ from habitat to habitat. The Shire needs to continue to work in collaboration with DBCA to determine fire sensitivity of different coastal habitats and adapt prescribed burns to manage the reserve vegetation complexes accordingly.

The maintenance and development of firebreaks may complement opportunities for formalising vehicle tracks through coastal areas, or the development of new recreational walk-trails in coastal reserves.

Table 4.5 – Strategies – Community Involvement

Strategy #	Description	Priority	Responsibility
Relevant Objectives: • Objective 4 – To ensure management and protection of the Shire's coastline is undertaken in a sustainable manner • Objective 5 – To ensure adequate consideration of coastal hazards is undertaken and ensure management is undertaken in accordance with SPP 2.6 and associated Guidelines • Objective 8 – To increase community awareness and participation in coastal management and maintain successful relationships between stakeholders and coastal users.			
CI1	Support programs that actively engage the local community in managing coastal reserves e.g. school education programs, beach clean-up days.	O	Shire of Denmark
CI2	Provide opportunities for the community to be involved in rehabilitation, monitoring, facility and access management etc.	O	Shire of Denmark
CI3	Assist and encourage the community with forming "Friends of" groups.	S	Shire of Denmark
CI4	Liaise with land managers in the study area, (including DPLH and Native Claim groups and private landholders) to discuss and determine a level of commitment towards community involvement and education.	O	Shire of Denmark, DPLH, Native Title claim groups
CI5	Continue to support an off-road and 4WD driver education program that focuses on providing information relating to safe off-road driving.	M-L	Shire of Denmark

Strategy #	Description	Priority	Responsibility
CI6	Provide surveys and continue to communicate with the public and visitors to the Shire's camping areas and day-use sites in order to gauge visitor expectations and to help plan for provision of facilities and services.	O	Shire of Denmark
CI7	Consider, where appropriate, formalising MOUs with community organisations who have an ability to implement on-ground management works.	O	Shire of Denmark

Granite outcrops and sandy beaches

4.4 ENVIRONMENT AND LANDSCAPE

Coastal areas are dynamic and valuable ecosystems that meet various environmental, social, and economic needs. They offer natural habitats, biodiversity, and ecosystem services that are vital for human well-being, and also host residential, tourism, and recreational activities that generate income and provide social benefits. Thus, balancing the interdependent needs and values of coastal environments is important.

GEOLOGY

The Shire of Denmark lies within the Proterozoic Albany-Fraser Orogen geological province (DBCA, 2008). The dominant rock type along the coastal areas is granite which formed around 345 to 1,140 million years ago when magma squeezed into the older gneisses to form batholiths. The granite rock formations are now exposed along the coast as large, rounded weathered boulders (DBCA, 2008). Ancient geological processes have resulted in the variety of landforms along the Shire's coast such as sheer cliffs, headlands, bays and peninsulas.

In the coastal areas, the Tertiary and Precambrian crystalline and sedimentary rocks are overlain by Tamala limestone and Aeolian sand. The Tamala limestone was formed 10,000 to 1.8 million years ago during the Pleistocene period. These limestone formations form large, steep cliffs, some 100 metres in height and act as a barrier behind which estuaries such as the Irwin Inlet have formed. They also provided the protection required to allow the formation of sandy beaches (DBCA, 2008). By the end of the Pleistocene period a poorly drained coastal plain had formed around granite hills and the estuaries and inlets were formed (Riney et al., 1987). The dune systems are known as the Meerup dunes and were formed between 10,000 years ago and the present. The beaches are typically located in small bays with exposed granite headlands and are linked by ridges and steep cliffs of Tamala Limestone (DBCA, 2008).

A number of important geological sites have been identified by Green and Wetherley (2000) who recommended the conservation of these areas as examples of unusual geological formations or sites that provide insight to the geological history of the area. These sites include:

- Boat Harbour – contains an example of magma mingling and assimilation
- Outcrops adjacent to Parry and Hillier Beaches – contains examples of magma

mingling and assimilation, mafic dyke swarms and polydeformation features

- McGeary's Rock – consists of excellent examples of refolded folds uncommon along the south coast.

SOILS

The land resources of the Study Area have been previously documented by the Department of Agriculture and Food (DPIRD) and are available via an online database at http://spatial.agric.wa.gov.au/slip/. The land resource information referred to in this report encompasses land systems and phases as identified by the DPIRD. Soils are generally categorised by DPIRD into soil-landscape units which are then refined into more detailed soil 'phases. The different soil phases found throughout the Shire's coastal reserves are described in Table 4.6 below.

Rounded sand dune - Parry Beach, Inlet

Table 4.6 – Soil phases and soil types found in at the Shire's coastal reserves

Code	Name	Location	Description	Soil types	Soil Qualities
254NkMRp	Meerup podzols over calcareous sand	Ocean Beach Reserve Peaceful Bay (inland) Boat Harbour – western section	Parabolic dunes with steep slopes and sharper crests on Aeolian calcareous and silicieous sands over sediments and granite.	Pale deep sands with some Yellow deep sands.	Wind erosion –high to extreme hazard Water erosion –high to extreme hazard.
254BrOW	Owingup Subsystem	Prawn Rock Channel Boat Harbour - embayment	Swamps plains adjacent to estuaries on estuarine deposits and Aeolian sands.	Wet soils, Semi-wet soils and Tidal soils.	Wind erosion –medium to high hazard Water erosion –medium to high hazard.
254NkMRs	Meerup podzols in siliceous sands	Parry Beach – inlet	Older, smooth rounded sand dunes on Aeolian calcareous and silicieous sands over sediments and granite.	Pale deep sands.	Wind erosion –high to extreme hazard Water erosion –medium to high hazard.
254NkMRy	Meerup calcareous sand	Parry Beach – main beach Boat Harbour – eastern section	Young dunes adjacent to the beach with very steep slopes and very irregular crests on Aeolian calcareous and silicieous sands over sediments and granite.	Calcareous deep sands.	Wind erosion –high to extreme hazard Water erosion –medium to high hazard.

Code	Name	Location	Description	Soil types	Soil Qualities
254NkMRc	Meerup leached calcareous sand	Parry Beach Reserve – Hillier Beach	Steeply sloping parabolic dunes with steep slopes and sharp irregular crests on Aeolian calcareous and silicieous sands over sediments and granite.	Calcareous deep sands with Pale deep sands and Calcareous stony soils.	Wind erosion –high to extreme hazard Water erosion –medium to high hazard.
254NkMRy	Meerup calcareous sand	Boat Harbour – north-eastern section	Young dunes adjacent to the beach with very steep slopes and very irregular crests on Aeolian calcareous and silicieous sands over sediments and granite.	Calcareous deep sands.	Wind erosion –high to extreme hazard Water erosion –medium to high hazard
254NkMRr	Meerup beach ridges	Peaceful Bay – beach	Beach ridge dunes and intervening swales on aeolian calcareous and silicieous sands over sediments and granite.	Calcareous deep sands.	Wind erosion –high to extreme hazard Water erosion –medium to high hazard.
254NkMRf	Meerup podzols on interdune plains	Peaceful Bay – residential area	Interdunal flats and Aeolian calcareous and silicieous sands over sediments and granite.	Pale deep sands and some semi wet soils.	Wind erosion –high to extreme hazard Water erosion –low to medium hazard.

Source: data.wa.gov.au

SOIL QUALITIES

As depicted in the table above, the majority of soil phases within the Shire's coastal reserves exhibit a heightened risk of wind erosion, ranging from high to extreme, along with a risk of water erosion spanning from medium to extreme. This pattern is typical in coastal regions, attributed to the inherent soil composition and prevailing weather conditions.

Erosion can be accelerated when the soil surface is disturbed, or vegetation is removed. This can result in changes to the landform, soil structure and nutrient loss. Human activities in coastal areas generally result in the disturbance of soils and removal of vegetation, and some have a higher impact than others. Activities such as 4WDs, horse riding, camping and picnicking can result in soil disturbance which can result in erosion, compaction and degradation of overall soil qualities. Therefore, it's important that land uses within coastal areas are appropriately managed to control access, development and activities and match appropriately to the landscape conditions to reduce any disturbance and hence the risk of erosion.

ACID SULPHATE SOILS

Acid sulphate soils contain iron sulphides which are benign unless the soil is disturbed and exposed to the air. The iron sulphides react with the oxygen in the air to result in a series of reactions which produce acids and sometimes, heavy metals. As the presence of acid sulphate soils can lead to an increase in acidity and result in the release of heavy metals, they can have severe environmental impacts and hinder development. Some environmental impacts caused by acid sulphate soils include:

- vegetation loss
- surface and groundwater degradation
- loss of aquatic fauna
- modification of aquatic communities.

The DWER has detailed guidelines on assessing, mitigating and managing acid sulphate soils where they have the potential to be disturbed. These guidelines must be followed if acid sulphate soil problems are to be averted. There is currently no mapping available relating to acid sulphate soils across the Shire's coastal reserves.

Current data is limited to areas where Acid sulphate soils are likely to be found – within the coastal environment this include the Wilson and Irwin inlets. Within these areas, the risk of Acid Sulphate soils is high-to-moderate within 3 metres of the surface.

VEGETATION AND FLORA

Native vegetation within the state of Western Australia has been assessed and classified in a number of different ways. A study conducted by Beard (1980) resulted in the division of the state into botanical provinces, districts and sub-districts based on ecological, climatic, geological and soil characteristics. The Shire of Denmark is located within the South West Botanical Province and the coastal areas lie within the Warren sub-district (DBCA, 2008). The South West Botanical province is recognised as one of 34 recognised international biodiversity 'hotspots' in the world due to its rich species diversity and endemism and the threats to those values.

The Warren sub-district is characterised by karri forests with extensive paperbark and sedge swamps occurring on low-lying areas. The soil types which occur at the coastal areas are generally poor in nutrients and have little soil structure. This, combined with strong winds and harsh weather conditions experienced on the coast, means that only the hardiest plants can survive in these areas.

In general, native plants such as peppermint trees (*Agonis flexuosa*) and Banksia spp. occur within the scrub and low woodlands on older dunes situated slightly inland from the coast. Limited patches of karri (*Eucalypts diversicolor*) and marri (*Corymbia calophylla*) grow on older weathered sands inland of the sand mantle. Granite outcrops, which emerge at numerous locations through the sand mantle, are usually covered in moss and pin grass and scattered shrubs. The native plants most commonly present on the coastal dunes include *Olearia axillaris, Scaevola crassifolia, Spyridium globulosum, Rhagodia baccata* and *Carpobrotus virescens*. The fore-dunes consist of *Spinifex hirsutus* and *Lepidosperma gladiatum* (Neil Blake and Associates, 2003).

RARE AND PRIORITY FLORA

Species of protected and priority flora are those which are; in danger of extinction, rare or need special protection. They are listed under the *Biodiversity Conservation Act 2016* and protected under the *Environmental Protection Act 1986*. Declared Rare Flora (DRF) are categorised as either Critically Endangered, Endangered or Vulnerable. Priority flora category is denoted at a state level by the DBCA as those species of plants at risk because they are poorly known, rare and require further survey.

An appropriate management response should be applied to sustain and grow the populations of relevant species and ensure their viability in suitable habitats. Areas with these species should be protected from activities (including access) that can harm the vegetation or introduce weeds. Therefore, seasonal flora surveys are recommended for any proposed change or development in the coastal reserves.

Rare and priority flora identified within the Shire's coastal reserves is as follows (information provided from the Shire of Denmark):

- Boat Harbour Reserve – *Xanthoparmelia subimitatrix*
- Parry Beach Reserve – *Andersonia amabile*
- Ocean Beach Reserve – *Thomasia quercifolia*
- Peaceful Bay Reserve – *Caladenia evanescens*.

Please note that this is not a definitive list of rare and priority flora within the Shire's coastal reserves and that further survey work is required to obtain a more comprehensive list.

VEGETATION CONDITION

The last assessment of vegetation condition ([1]see table below for descriptions) was undertaken as part of the Denmark Greening Plan in 2007. The conditions recorded were as follows:

1

Vegetation condition	Classification
Pristine	No obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance limited to individual species, non-aggressive weeds present.
Very Good	Vegetation structure altered and some signs of disturbance (as a result of fire, dieback, the presence of weeds etc.)
Good	Vegetation structure significantly altered and obvious signs of disturbance (as a result of frequent fires, some clearing, dieback, high density of weeds etc.). Basic vegetation structure retained and possibility of regeneration.
Degraded	Vegetation structure severely impacted. Scope for regeneration, but only possible with intensive management.
Completely degraded	Vegetation structure no longer intact and almost no native species present.

- Ocean Beach Reserve – majority classified as Pristine
- Parry Beach Reserve – vegetation around high use areas classified as Excellent and surrounding areas range from Pristine to Very Good
- Boat Harbour Reserve – majority classified as Pristine
- Peaceful Bay Reserve – dune vegetation surrounding the bay is classified from Very Good to Degraded. Vegetation around the leased area classified as Good to Degraded.

THREATENED ECOLOGICAL COMMUNITIES

Threatened Ecological Communities (TEC's) are defined in the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) as communities which consist of native vegetation which are poorly represented and in danger of extinction. The rarity of TEC's makes them matters of national environmental significance under the EPBC Act. Therefore, any proposed activities that could possibly have an effect on a TEC must undergo the approvals process outlined in the EPBC Act. Several of the Shire's reserves are partially classified as TEC's. These include Coastal *Melaleuca incana/Taxandria juniperina* Shrublands (P1 TEC) and Subtropical and Temperate Coastal Saltmarsh.

ENVIRONMENTAL WEEDS

The presence of invasive weeds and introduced flora raises significant environmental concerns in Australia, particularly in degraded areas where these plants exhibit a remarkable ability to establish and thrive. The ensuing adverse impacts on the ecosystem encompass:

- Competition with native flora for essential resources like nutrients, light, and water, impeding their regeneration.
- Alteration of ecological dynamics, creating habitats advantageous for introduced fauna species.
- Diminution of suitable habitat for native fauna species.
- Disruption of natural ecological and physical processes within the environment, such as fire regimes.

Typically introduced to regions for private garden use, weeds infiltrate coastal reserves and spread further due to general vegetation disturbance, thereby increasing the likelihood of colonisation. Table 4.7 identifies some of the most prevalent weed species found in coastal reserves.

Table 4.7 – Shire of Denmark Weed Species List

Scientific Name	Common Name
Acacia iteaphylla	Flinders Ranges Wattle
Acacia longifolia	Sydney Golden Wattle
Agapanthus praecox	Agapanthus
Ailanthus altissima	Tree of Heaven
Asparagus asparagoides	Bridal Creeper
Chamaecytisus palmensis	Tagasaste
Conyza sp.	Fleabane
Cortaderia selloana	Pampas Grass
Cotoneaster sp.	Cotoneaster
Datura suaveolens	Angels Trumpet
Dipogon lignosus	Dolichos Pea
Emex australis	Doublegee
Eragrostis curvula	African Love Grass
Homalanthus novo-guineensis	Bleeding Heart
Lantana camara	Lantana
Leptospermum laevigatum	Coastal (Victorian) Tea Tree
Phytolacca octandra	Inkweed
Pittosporum undulatum	Sweet Pittosporum
Polygala myrtifolia	Butterfly Bush
Psoralea pinnata	Taylorina
Ricinus communis	Caster Oil Tree
Soliva pterosperma	Onehunga
Watsonia sp.	Watsonia

Source: Neil Blake and Associates, (2003) and Shire of Denmark (n.d.)

FAUNA

The abundance of native fauna in the South-West has declined since European settlement mainly due to impacts such as habitat destruction and the introduction of feral predators (foxes and cats). The Shire's coastal reserves consist of relatively large areas of intact remnant vegetation which are likely to support a range of habitat types and associated fauna.

Previous studies on native fauna along the south coastal areas by Christensen et al. (1985) provided results described below.

MAMMALS

Christensen et al. (1985) found that there is a distinct mammal fauna of the southern Banksia woodland and heathland areas. This includes species such as *Tarsipes rostratus* (Honey Possum), *Cercartetus concinnus* (Western Pygmy Possum), *Phascogale tapoatafa* (Brush-tail Phascogale), *Rattus fuscipes* (Bush Rat) and *Antechinus flavipes* (Yellow-footed Antechinus) (Neil Blake and Associates, 2003).

Marine mammals are regularly seen in the ocean including Bottlenose Dolphins (Tursiops truncates) and occasional sightings of Australian Sea Lions and New Zealand Fur Seals. Southern Right Whales and Humpback Whales pass by the coast on their migration northwards (Neil Blake and Associates, 2003).

BATS

The most commonly recorded bats in the area include *Vespadelus regulus* (King River Eptesicus), *Falsistrellus mackenziei* (Western False Pipistrelle) and *Chalinolobus morio* (Chocolate Wattled Bat) (Neil Blake and Associates, 2003).

BIRDS

Birds are abundant within the Shire's coastal areas, largely owing to the large, intact areas of native vegetation and the variety of habitat types. The proteaceous heath habitats include a large number of different species of honeyeaters as well as White-breasted Robins (*Eopsaltria seorgiana*) and the Red-Eared Fire Tail (*Emblema oculata*), Southern Emuwren and Collared Sparrowhawk, along with endangered White-tailed Black Cockatoos (Baudin's

and Carnaby's). Bird species typically found in forest habitats are also found in coastal areas including the Western Rosella (*Platycercus icterotis*) and the Red-capped Parrot (*Purpureicephalus spurious*) (Christensen et al. 1985).

Migratory shorebirds frequently inhabit the southern coastal areas of Western Australia during certain times of the year. These birds travel from the Northern Hemisphere and migrate to wetlands throughout Australia to feed and roost. Migratory shorebirds are present from mid-spring to mid-autumn. A number of wetlands and estuaries in the Shire are important breeding areas for migratory birds and native shorebirds including Ocean Beach, Owingup Swamp, Boat Harbour, Lights Beach, Peaceful Bay, Rame Head, Quarrum Beach, William Bay National Park, Foul Bay, Cliffy Head Beach, Lost Beach, Parry Inlet and Mandalay Beach. Waterbird species include the threatened species Australasian Bittern (*Botaurus poiciloptlilus*) and Little Bittern (*Ixobrychus minutes*) (Neil Blake and Associates, 2003). Migratory birds are protected under the EPBC Act (1999) and several international treaties[2].

The Wilson Inlet mouth and bar area is the second most important area of the inlet for shorebirds and the most important site for seabird roosting. At least 10 species of migratory birds, 6 species of resident shorebirds and 7 species of seabird are known to utilise the area. At least one resident shorebird, the Redcapped Plover is known to breed there. The impacts resulting from humans, dogs and vehicles on shorebirds, resident shorebirds and seabirds include specifically disturbance to important feeding, roosting and breeding regimes. Disturbance of breeding birds can lead to abandonment of eggs and young.

Bondin A. (2008) conducted a bird survey of the Wilson Inlet in 2008 to collect data on the bird species present and to make observations about their requirements. The study found that changes in the water levels of the Inlet have a huge impact on populations of migratory shorebird species and that recreational use of the Inlet and foreshore reserves can lead to unnecessary disturbance of waterbirds and recommended that domestic pets should not be allowed to interfere with birds. A more recent and extensive study of the inlet and mouth in particular (Poddyshot to Bar) by Birdlife Australia from 2009 to present has confirmed the importance of the area for endangered migrant and resident shorebirds and waterbirds for feeding, roosting and breeding and the subsequent need to protect the area to sustain these populations.

2 JAMBA, CAMBA and ROKAMBA, with other relevant conventions and voluntary international partnerships.

REPTILES

There are few reptile species located along the southern coastal areas in Denmark compared to areas further east. One species of Geckos has been recorded and a number of species of skinks. Species restricted to the south-west coastal areas include Little Brown Snake (*Elapognathus minor*) and Muellers Snake (*Rhinoplocephalus bicolour*) and the threatened Carpet Python (*Morelia spilota imbricata*) (Christensen et al. 1985). The Long-Necked Turtle (*Chelodina oblonga*) is found in freshwaters in the southern coastal area (Neil Blake and Associates, 2003).

AMPHIBIANS

The Shire of Denmark has rich diversity in frog species, including six to eight different species located in the damp areas of coastal areas. The Bell Frog (*Litoria moorei*) is the only climbing frog species found in the area and the remainder are either ground-dwelling or burrowing species.

FISH

The Parry, Wilson and Irwin Inlets are important habitats for native fish species. Most are marine species which enter the estuaries when the sand bars are open. Fish species regularly caught for commercial purposes include the Cobbler, King George Whiting, Black Bream, Pink Snapper, Herring, Leatherjacket, Flounder, Mullet, Flathead, Silver Bream and crab. Non-commercial species include the Western Pigmy Perch, Zebra Fish and Hardyhead. The Wilson Inlet is an important nursery ground for the King George Whiting, and it's estimated that 70% of Cobbler caught in the south coast come from Wilson Inlet (Neil Blake and Associates, 2003).

THREATENED FAUNA

The conservation status of Threatened Fauna is listed under the *Biodiversity Conservation Act 2016*. They are classified as 'Rare or likely to become extinct (Schedule 1)', 'Birds protected under an international agreement (Schedule 3)', and 'Other specially protected fauna (Schedule 4)'.

Previous research conducted by Neil Blake and Associates (2003) indicates that there

are three threatened mammal species and three threatened bird species in the Shire. The threatened mammals include the Quokka (*Setonix brachyuran*), the Western Ringtail Possum (*Psudocheirus occidentalis*) and the Chuditch (*Dasyurus goeffroii*). The Western Ringtail Possum occurs in coastal vegetation and Peppermint Woodland.

Threatened bird species in the Shire include the Australian Bittern (Botaurus poiciloptilus), Carnaby's Black Cockatoo (*Calyptorhyncus latrostris*) and Baudin's Cockatoo (*Calyptorhyncus baudinii*). The Australian Bittern occurs at Owingup Swamp and has been recorded at Parry Inlet. Carnaby's Black Cockatoo feed in the coastal heath and scrub vegetation in drier months (Neil Blake and Associates, 2003), and these coastal feeding grounds are very significant for the long-term conservation of cockatoo populations along the South Coast

The survival of these species is threatened by destruction of habitat areas and predation by feral animals. Therefore, it's important that the future use and management of the Shire's coastal reserves aims to minimise impacts on vegetation cover and condition and retain habitat for native fauna.

Introduced fauna such as rabbits, cats, dogs, foxes, mice and black rats have significant impacts on native fauna and vegetation condition, and in general contribute to vegetation disturbance and weed encroachment.

MARINE MAMMAL STRANDINGS

Marine mammal strandings occur fairly regularly along the South Coast. Different species are likely to require different management strategies, either for rescue, relocation or disposal. DBCA is responsible for the rescue and relocation of live animals; however the disposal of dead animals is the Shire's responsibility. Conflict between vehicles and/or dogs on beaches with exhausted or injured stranded marine mammals requires specific ready management strategies such as information signage at access points to these beaches, with DBCA contact details for observed animal strandings. The Shire has a Marine Mammal Stranding Policy specific to Shark Hazard and Whale Beaching which outlines the procedures by which the Shire can respond and liaise with inter-agencies and the community to effectively manage marine mammal strandings.

LANDSCAPE

The Denmark coastline has a diverse landscape of granite outcrops, headlands, rocky bays, sandy beaches, and dunes. People are drawn to its natural beauty and want to access and enjoy its ecological and biological values.

The Shire's coastal reserves provide spectacular views from almost every location. A key characteristic of the landscape is the undeveloped coastline and wildness of the adjoining natural areas and the wilderness views and aesthetic quality of the Shire's coastal reserves greatly contributes to the region's popularity as both a holiday destination and attraction for permanent resident accommodation.

Visual impacts on landscapes are a key factor for coastal management planning. Therefore, visual assessments and planning should consult the Visual Landscape Planning in WA: A manual for evaluation, assessment, siting and design (WAPC 2007).

Table 4.8 - Strategies - Environment and Landscape

Strategy #	Description	Priority	Responsibility
Relevant Objectives: • Objective 1 – Identify current land uses, values and issues of the Shire's coastal land which may impact upon coastal management for the next 10 years. • Objective 2 – Manage the environmental and recreational values of the coastline in order to retain the broad range of recreational opportunities, environmental values and sense of isolation unique to the area. • Objective 4 – To ensure management and protection of the Shire's coastline is undertaken in a sustainable manner.			
EL1	Refer to the Visual Landscape Planning in WA manual (WAPC, 2007) for guidance during visual assessments and planning for recreational elements along the Shire of Denmark's coastline.	O	Shire of Denmark (Shire reserves) Landowners (Freehold) DPLH (UCL)

Strategy #	Description	Priority	Responsibility
EL2	In the design of new coastal car parks, roads, and buildings, prioritise minimising visual impact on the surrounding environment and preventing sand drift effects. This may involve avoiding straight pathways and roads, considering prevailing wind and sand movement, among other factors.	O	Shire of Denmark (Shire reserves) Landowners (Freehold) DPLH (UCL)
EL3	Promote access to the coast through formal tracks and pathways, utilising fencing and signage where dune degradation is a concern.	O	Shire of Denmark (Shire reserves) Landowners (Freehold) DPLH (UCL)
EL4	Regularly monitor dunes around camping areas and high-use sites for signs of degradation. Close and rehabilitate informal tracks promptly, aligning with the program of works developed by the responsible landowner and utilising appropriate methods such as brushing and re-vegetation.	O	Shire of Denmark (Shire reserves) Landowners (Freehold) DPLH (UCL)
EL5	Encourage local nurseries to cultivate coastal plants suitable for dune rehabilitation. Undertake seed collection, possibly as a community project, to preserve the local provenance of species.	O	Shire of Denmark
EL6	Establish a dieback monitoring program if signs of dieback are identified in the study area, following the guidelines outlined in Managing Phytophthora Dieback in Bushland by the Dieback Working Group (2015).	M-L	Shire of Denmark
EL7	Seek assistance from the Department of Primary Industries and Regional Development for the eradication of feral rabbits, foxes, and cats from the study area, while also encouraging private landholders to participate in these eradication efforts.	S	Shire of Denmark DPIRD
EL8	Ensure that responsible planning, in accordance with the principles and objectives of SPP2, considers coastal planning requirements during the preparation of the Shire's new Local Planning Scheme.	O	Shire of Denmark
EL9	Support community and Denmark Weed Action Group efforts in weed control.	O	Shire of Denmark (Shire reserves) Landowners (Freehold) DPLH (UCL)
EL10	Develop a coordinated Signage Strategy for the Shire's coastal area, accounting for potential annual shifts due to sand drift.	O	Shire of Denmark (Shire reserves) Landowners (Freehold) DPLH (UCL)
EL11	Ensure appropriate signs are installed at coastal sites, encompassing hazard and warning signs outlining evacuation procedures for inundation or fire, interpretative and historic information, educational content, safety information, directional signage, and information on land use permissions and prohibitions.	O	Shire of Denmark (Shire reserves) Landowners (Freehold) DPLH (UCL)

Strategy #	Description	Priority	Responsibility
EL12	Encourage access to the coast via formal tracks and pathways, implementing fencing and signage where dune degradation is a concern.	M-L	Shire of Denmark
EL13	Undertake beach inspections to identify nesting birds at appropriate times. Should nests be identified, install temporary fencing and/or signage to discourage 4WD and dogs from the areas.	O	Shire of Denmark
EL14	Develop a protocol to identify and record rare and endangered flora within Shire reserves.	S	Shire of Denmark

5.0 Ocean Beach, Wilson Head & Back Beach

5.1 DESCRIPTION

OVERVIEW: OCEAN BEACH RESERVE MANAGEMENT

Ocean Beach Reserve is a pristine coastal area that spans about 10 km from the Wilson Inlet outlet to the western boundary of William Bay National Park. It includes various attractions, such as Prawn Rock Channel, Ocean Beach, Lions car park, McGeary's Rock, Black Hole car park, Sinker Bay car park, Back Beach, and Lights Beach. The reserve attracts many tourists who enjoy the scenic ocean views from different access roads and lookout points.

PRAWN ROCK CHANNEL PRECINCT

The Prawn Rock Channel precinct, situated on the western side of the Wilson Inlet opening, includes key locations such as two car parking areas along Ocean Beach Road, the dog exercise area at the Inlet, and the Ocean Beach Lookout at the southern end of the opening. The Shire is currently in the process of upgrading the recreational area at Prawn Rock Channel, and this work is supported by the CRMP.

During the 1940s and 50s, Prawn Rock Channel and Ocean Beach attracted summer visitors engaging in holiday activities such as camping and fishing. Reserve 20578 at Prawn Rock Channel was a hub for camping, featuring amenities like tea rooms, a general store, and picnic facilities.

OCEAN BEACH

Ocean Beach, the primary beach within the reserve, spans approximately 500 metres and is a hub for recreational, commercial, club-based, and emergency services activities. Its popularity is underscored by lifeguard records, indicating over 10,000 visitors during the summer, with peak crowds reaching up to 650 people at peak times.

A range of activities at Ocean Beach includes swimming, surfing, sandboarding, fishing, sunbathing, exercise, boat launching, sightseeing, picnicking, surf lifesaving, and surfing instruction. Commercial surfboard hire operates during the summer, complemented by the presence of the Denmark Surf Lifesaving Clubrooms and the Denmark Boating and Angling Club combined with the Denmark Sea Rescue Group building.

The Denmark Surf Lifesaving Club is currently being redeveloped using funds from the Department of Transport HCAP program and the Shire of Denmark.

WILSON HEAD CAR PARKS

Within the expansive Ocean Beach Reserve are several strategically positioned lookouts around Wilson Head, including (from north to south) the Lions car park, McGeary's Rock, Black Hole, and Sinker Bay . Access is via a limestone non-gazetted road, suitable for 2WD access, that follows land terrain and is constructed with locally sourced limestone to blend with the landforms of the coastal landscape.

WILSON HEAD

Wilson Head is a popular destination for nature lovers, sightseers, and walkers and is therefore mainly used for low-key passive recreation. It has popular fishing spots around Black Hole and McGeary's Rock, and a scenic environment for coastal trekking.

Some of the existing walking trails are not connected, and there is no continuous walking/cycling trail from Ocean Beach to Sinker Bay. This is an opportunity to improve the connectivity and amenity of the area and enhance the visitor experience. A proposed trail would provide uninterrupted access to panoramic views and seasonal marine life. The WOW Trail, which ends at Sinker Bay, is a recent improvement in this area.

BACK BEACH

Back Beach, situated midway along the Ocean Beach Reserve coastline, is accessible via a 4WD-compatible soft sand track and faces the south-west. A wooden staircase facilitates access from the beach to the car park.

Despite its remote location, Back Beach supports a range of activities, including swimming, surfing, fishing, walking, and nature observation. The site features basic infrastructure, including a small car park, beach access steps, and necessary signage.

Back Beach's appeal stems from its peaceful atmosphere and untouched beauty, making it a preferred destination for those in search of a secluded and natural coastal experience.

5.2 TENURE

Table 5.1 - Ocean Beach Tenure

Reserve Details	Description
Ocean Beach Reserve – 24913 (Lot 7625 on P216756)	The total area of this reserve is 545ha and is classified as a Class 'A' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Parklands and Recreation.
Ocean Beach Reserve – 20578 (Lots 8234 and 8235 on P35326)	The total area of this reserve is 13ha and is classified as a Class 'C' reserve. The reserve is located at the north-east end of the Ocean Beach Reserve Study Area and includes two small parcels of land near the opening of the Wilson Inlet. The management orders are with the Shire of Denmark and the current purpose is listed as Camping.
Ocean Beach Reserve – 24596 (Lot 6119 on P164260)	This reserve includes a very small area of land (0.06ha) along Ocean Beach Road near the Wilson Inlet. It is classified as a Class 'C' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Recreation.
Ocean Beach Reserve – 39727 (Lot 7622 on P14650)	This reserve borders the northern boundary of R24913 at the western end of the study area. The management orders are with the Shire of Denmark and the land use is listed as Public Recreation. The reserve is 56.45 ha in size and includes the access road to Lights Beach.

5.3 ISSUES AND OPPORTUNITIES

PRAWN ROCK CHANNEL

The Prawn Rock Channel is a key recreational area near Wilson Inlet, popular for dog walking and accessing Ocean Beach's north end when the Inlet is closed. It is one of the few grassy spots in the precinct, attracting low-intensity recreation and tourism. The channel offers a safer swimming spot for beginners. However, it is also next to Ocean Beach Road, the main route from Denmark to Ocean Beach and Wilson Headland, and access to the nearby extractive industry, creating a pinch point and potential safety issue for users. Relocating the road further inland has been investigated by the Shire and is not feasible due to topography and an Aboriginal Heritage site. Therefore, the road will likely remain, with measures to reduce traffic speed and improve pedestrian safety to be considered. Parking is limited, with a small car park nearby and an overflow area across Ocean Beach Road.

The Shire is improving the site for recreational use, currently implementing a master plan that will provide for better car parking, toilet facilities, grassed picnic areas, and related infrastructure.

South of Prawn Rock Channel, the Ocean Beach lookout, a top tourist attraction in the Shire, has issues with informal and unsafe beach access from the cliffside. The Shire is addressing this by restricting access to the cliff and building a new pedestrian pathway from the lookout car park to the beach.

While the car parking area and existing lookout are presently in reasonable condition, their significance as a tourist destination warrants consideration for upgrades, including improvements to the car park, pathway replacement to address potential trip hazards, and enhancement of the lookout with interpretive signage.

The environmental value of Prawn Rock Channel and the Wilson Inlet bar area should be taken into account in any future management. This area is a vital habitat for shorebirds and a main site for seabird roosting among the inlet sections. It hosts a diverse bird community, with at least 10 migratory, 6 resident shorebird, and 7 seabird species regularly visiting. The Red-capped Plover, a resident shorebird, breeds here. Management threats from people, dogs and vehicles requires ongoing management.

OCEAN BEACH

Ocean Beach is a main hub for the surf club, Angling Club, boat launching facilities, and various recreational activities. The site was identified as a Coastal Hotspot in Assessment of Coastal Erosion Hotspots in Western Australia which resulted in the preparation of the Shire's 2018 Coastal Hazard Risk Management and Adaptation Planning (CHRMAP) to address ongoing erosion at the location.

Ocean Beach has challenges such as insufficient parking during busy seasons, vehicles entering the restricted zone along the beach, and potential conflicts over land use and safety. These challenges result from the location's popularity among locals and tourists. The main issues are:

- Unpredictable conditions and large swells that can be risky for beach users and swimmers who are not familiar with the area.
- Increased use of beach access pathways and roads that can damage dunes and vegetation, especially if pedestrians and drivers do not follow the designated access ways.
- Vehicles trespassing into the vehicle-free area of Ocean Beach near the boat launching site, creating safety concerns.
- Misuse of the emergency access track by general beach users, posing a safety risk in case of emergencies that need quick access.
- Parking area at Ocean Beach reaching full capacity during peak holiday periods, and even during off-peak seasons.

The Shire is developing a detailed master plan for the Ocean Beach precinct, following the Coastal Reserves Management Plan (CRMP). Detailed plans are in Appendix C of this document. A set of actions is proposed to address and mitigate the challenges in this location.

WILSON HEAD

Wilson Head requires minimal additional management, with the focus primarily on enhancing connectivity and overall visitor experience. A notable opportunity is extending the WOW trail, which ends at Sinker Bay, to circle the headland and connect to Ocean Beach. This would create a continuous coastal walkway, linking key destinations like Ocean Beach and Lights Beach. This could be a major tourist attraction for the Shire.

Access to nodes around Wilson Inlet is low-key, and this should be retained. There is, however, some scope for formalising access tracks within road reserves and possibly upgrading unsealed roads in the future, but these are not urgent.

BACK BEACH

Back Beach is isolated and more difficult to access that other sites, which protects it from usage pressures but also makes it vulnerable to human impact without regular management presence. The main challenges are:

- Dune erosion and vegetation damage along the access track, caused by 4WD vehicles driving off the path into the vegetation.
- Track degradation from vehicles not reducing tire pressures, creating wallow holes and getting stuck.
- Exposure of the pedestrian access down the cliff to wind, salt spray, and moisture, which can damage the stairway. Regular inspections and maintenance are needed to prevent safety issues.
- Expected growth in pedestrian traffic from the WOW Trail passing through the site, which may increase site usage. Continuous monitoring of site usage is advised to enable timely management responses if usage increases significantly.

Back Beach access

Prawn Rock Channel

Stairs under construction, Ocean Beach

Wilson Headland access track and car parks

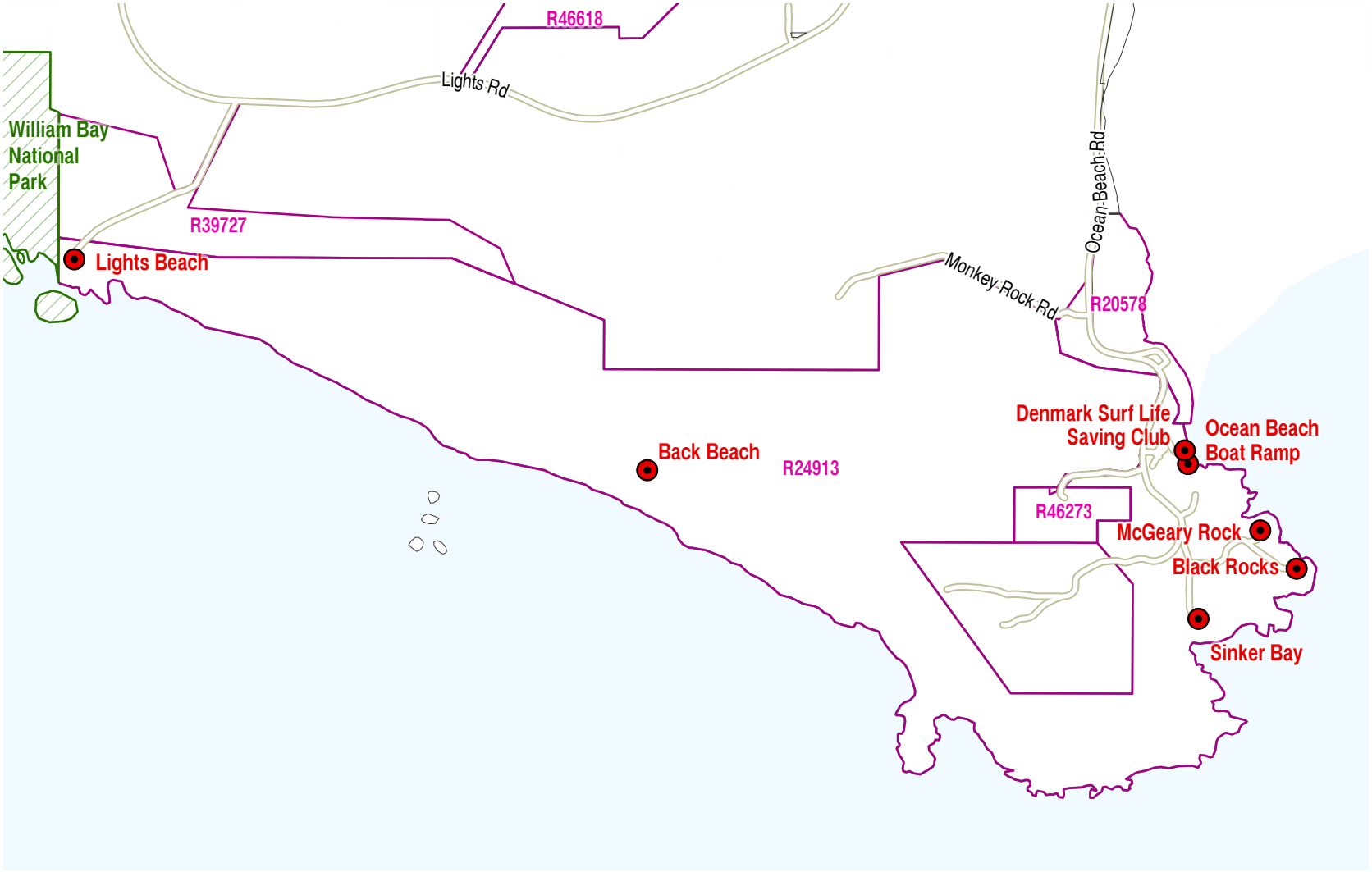
5.4 RECOMMENDED ACTIONS – OCEAN BEACH, WILSON HEAD AND BACK BEACH

Table 5.2 - Ocean Beach, Wilson Head and Back Beach Actions

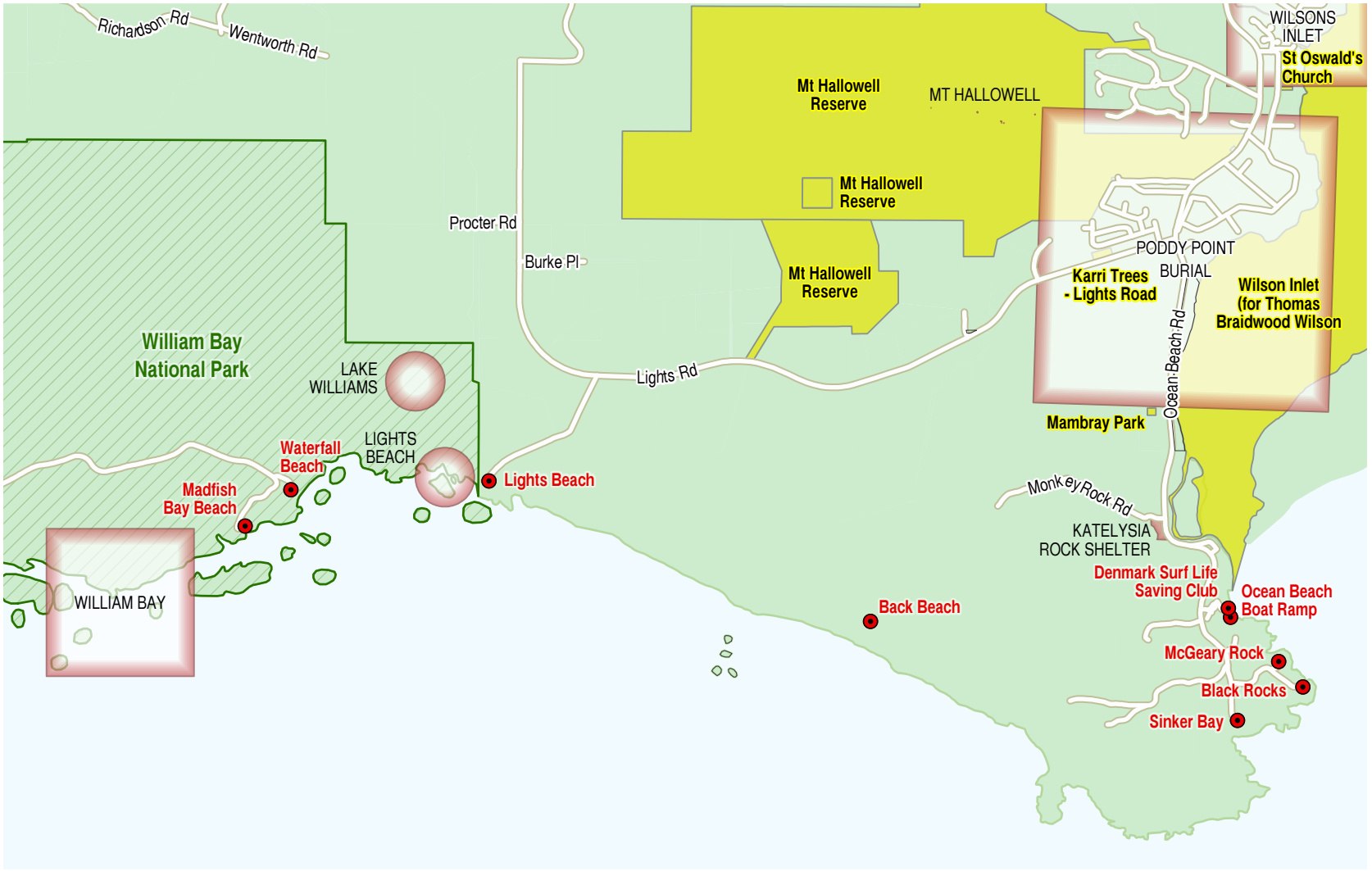
(to be read in conjunction with relevant action plans)

Action #	Description	Priority
OB1	Maintain the formal shared path which extends from Ocean Beach Surf Life Saving Club to Prawn Rock Channel.	M-L
OB2	Erect signage regarding location of public toilets.	S
OB3	Consider feasibility of creating a raised surface or cobblestone area adjacent to Prawn Rock Channel to slow traffic.	M
OB4	Investigate possible options to provide an alternative route for the nearby extractive industry that would decrease truck movements adjacent to Prawn Rock Channel	M
OB5	Improve fencing to close off the access track down the cliff and implement signage stating "Danger of Unstable Cliffs".	S
OB6	Improve lookout to provide a high-quality experience. Focus on capacity; use of premium materials; and formalise the car parking area.	M
OB7	Finalise implementation of Prawn Rock Channel recreational area upgrades, including measures to control rubbish and maintain water quality	S
OB8	Close and manage duplicate 4WD tracks	O
OB9	Retain soft-sand access track	O
OB10	Ensure beach (north of surf lifesaving club) remains closed to vehicles	O
OB11	Retain seasonal vehicle access for boat launching.	O
OB12	Maintain toilet facilities.	O
OB13	Possible car park expansion	M
OB14	Close and manage duplicate walking tracks	O
OB15	Excise existing roads into separate road reserves.	L
OB16	Continue the WOW Trail between Sinker Bay and Ocean Beach.	M
OB17	Retain soft sand access track.	O
OB18	Block off vehicle access to divergent tracks as shown on plans.	O
OB19	Maintain staircase, particularly at the beach end.	O
OB20	Inspect access on a monthly basis, and respond promptly to complaints regarding access restriction.	O
OB21	Monitor usage of the site to identify any needs for additional management.	O

Ocean Beach; Wilson Inlet in background



Plan 5.1
Ocean Beach - Tenure
SHIRE OF DENMARK

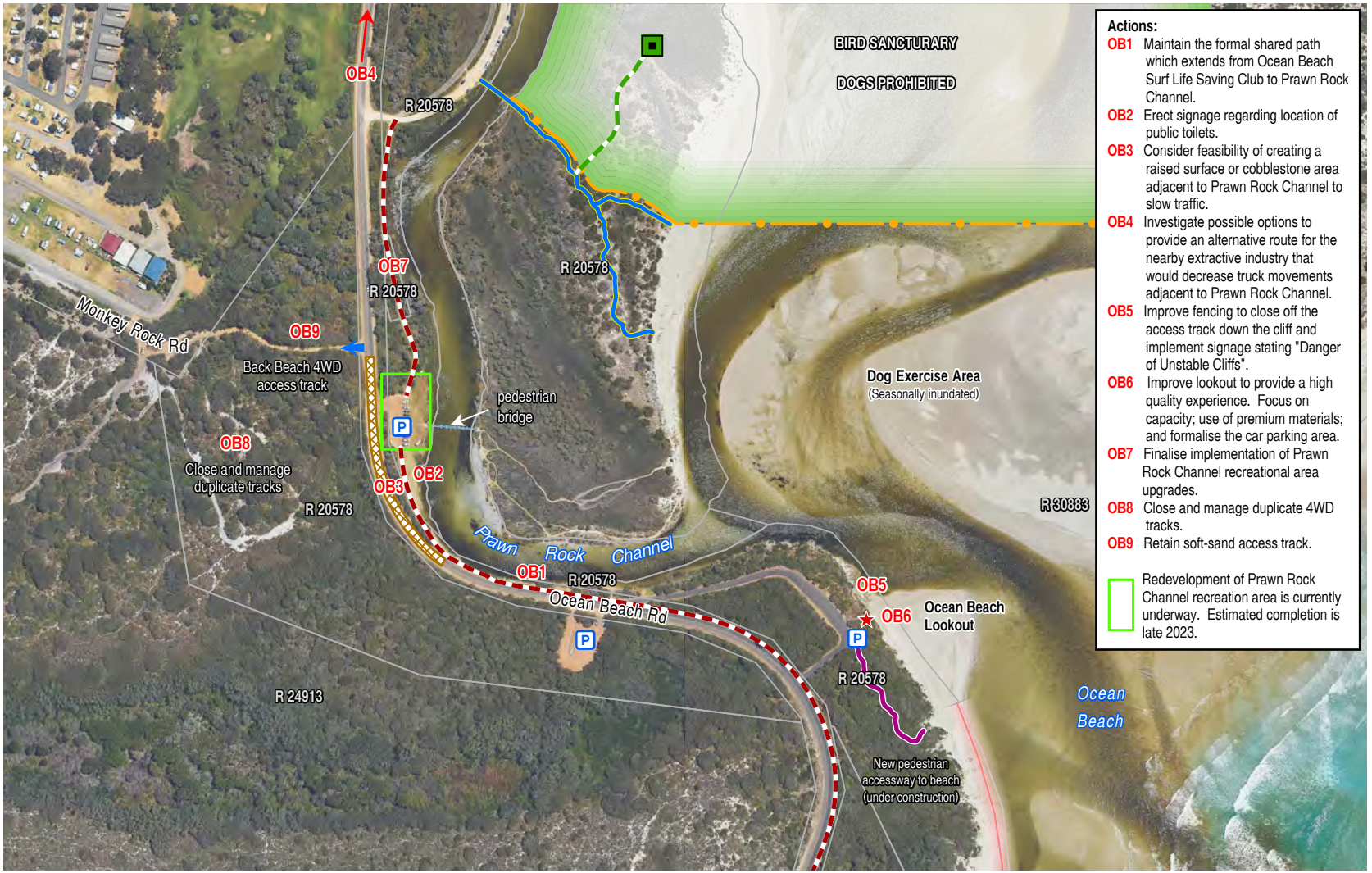


SD 1118-006-02-01 Ocean Beach - Heritage

Plan 5.2
Ocean Beach - Heritage
SHIRE OF DENMARK

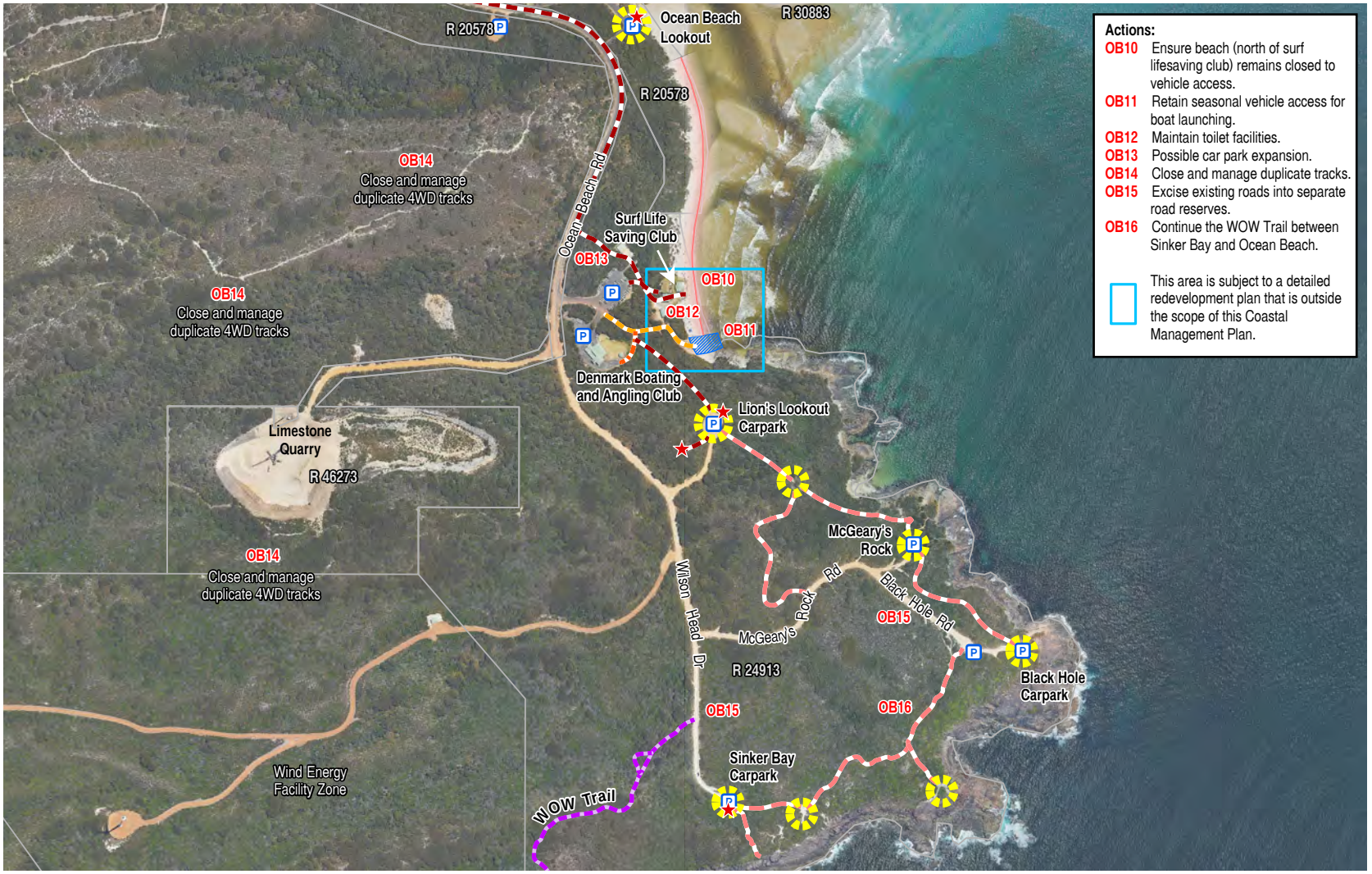
Plan 5.3
Ocean Beach - Environmental
SHIRE OF DENMARK

SD 1118-006-03-01 Ocean Beach - Enviro



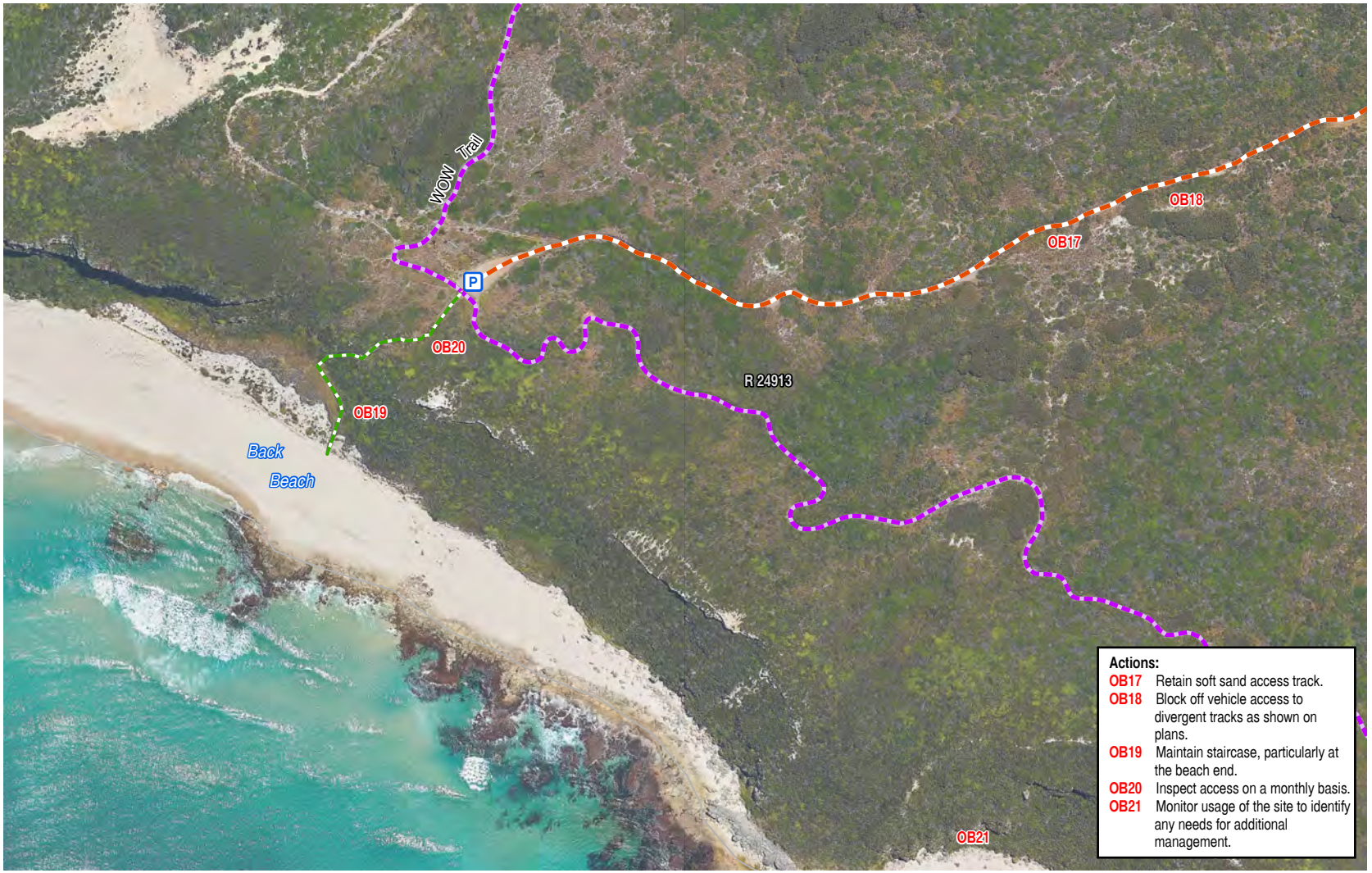
SD 1118-007-01-03 Prawn Rock Channel

Plan 5.4
Prawn Rock Channel (actions)
SHIRE OF DENMARK



SD 1118-007-02-02 Wilson Head

Plan 5.5
Wilson Head (actions)
SHIRE OF DENMARK



Plan 5.6
Back Beach (actions)
SHIRE OF DENMARK

SD 1118-007-04-02 Back Beach

6.0 Lights Beach

6.1 DESCRIPTION

Lights Beach is a coastal area west of Back Beach and next to the William Bay National Park, managed by the DBCA. It has three small bays between granite headlands, creating peaceful and calm beach spots. A feature is the Bibbulmun Track passing through part of this reserve, as a state tourism attraction for walkers and nature lovers.

Primarily recognised for surfing, fishing, walking, nature appreciation, dog exercise, picnicking, and occasional swimming, Lights Beach offers a range of recreational opportunities. Fishing enthusiasts can target Kingfish, Whiting, Skippy, Herring off the rocks, while Salmon and Flathead are common catches along the beach. Lights Beach is one of the more popular Shire-managed beaches, but it can have strong rips and swells that make swimming potentially hazardous.

Lights Beach has been improved since the last Coastal Reserves Management Plan (CRMP). The gravel road has been replaced with a bituminised road for all vehicles. The upgrade includes a well-designed car park, landscaping, lookout points, constructed beach access, toilet facilities, and educational signage. The development follows the DBCA style guide, ensuring a consistent and attractive coastal infrastructure and signage along this coast.

Lights Beach is also the western end of the WOW Trail, connecting to Sinker Bay at Wilson Head, providing a scenic and smooth coastal trail experience. This integration enhances the accessibility and appeal of Lights Beach as a key node in the coastal network.

6.2 TENURE

Table 6.1 – Lights Beach Tenure

Reserve Details	Description
Ocean Beach Reserve – 24913 (Lot 7625 on P216756)	The total area of this reserve is 545ha and is classified as a Class 'A' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Parklands and Recreation.
Ocean Beach Reserve – 39727 (Lot 7622 on P14650)	This reserve borders the northern boundary of R24913 at the western end of the study area. The management orders are with the Shire of Denmark and the land use is listed as Public Recreation. The reserve is 56.45 ha in size and includes the access road to Lights Beach.

6.3 ISSUES AND OPPORTUNITIES

The site has been upgraded and maintained since the previous CRMP. It is well-used and only requires minor management adjustment, largely based on community and user feedback. Some of these are:

The access road before the car park has a crest that could potentially be dangerous if vehicles are overtaking. To minimise the risk, a solid white line and a speed limit sign should be applied to this section of the road.

The car park can become busy and full during peak periods, causing overflow into nearby areas. To accommodate this, temporary overflow street parking along the access road could be established. This will avoid impacting sensitive areas and provide more parking options for visitors.

The parking turnaround area is not suitable for large and rigid vehicles, such as buses, when the parking area is full. Retrofitting this area would be difficult and expensive, but potential upgrades could be considered in the long term if demand increases. A possible upgrade could include a bus lay-by, which will allow buses to park and turn around more easily.

The car park has low-level steel bollards around it, which are hard to see when vehicles are being parked. Anecdotally, it has been mentioned that there have been occasions when vehicles have collided with the bollards due to their lack of visibility. A possible solution is to replace the bollards with something more visible.

For overview tenure, heritage and environmental plans, refer to Chapter 5 (figures 5.1 - 5.3).

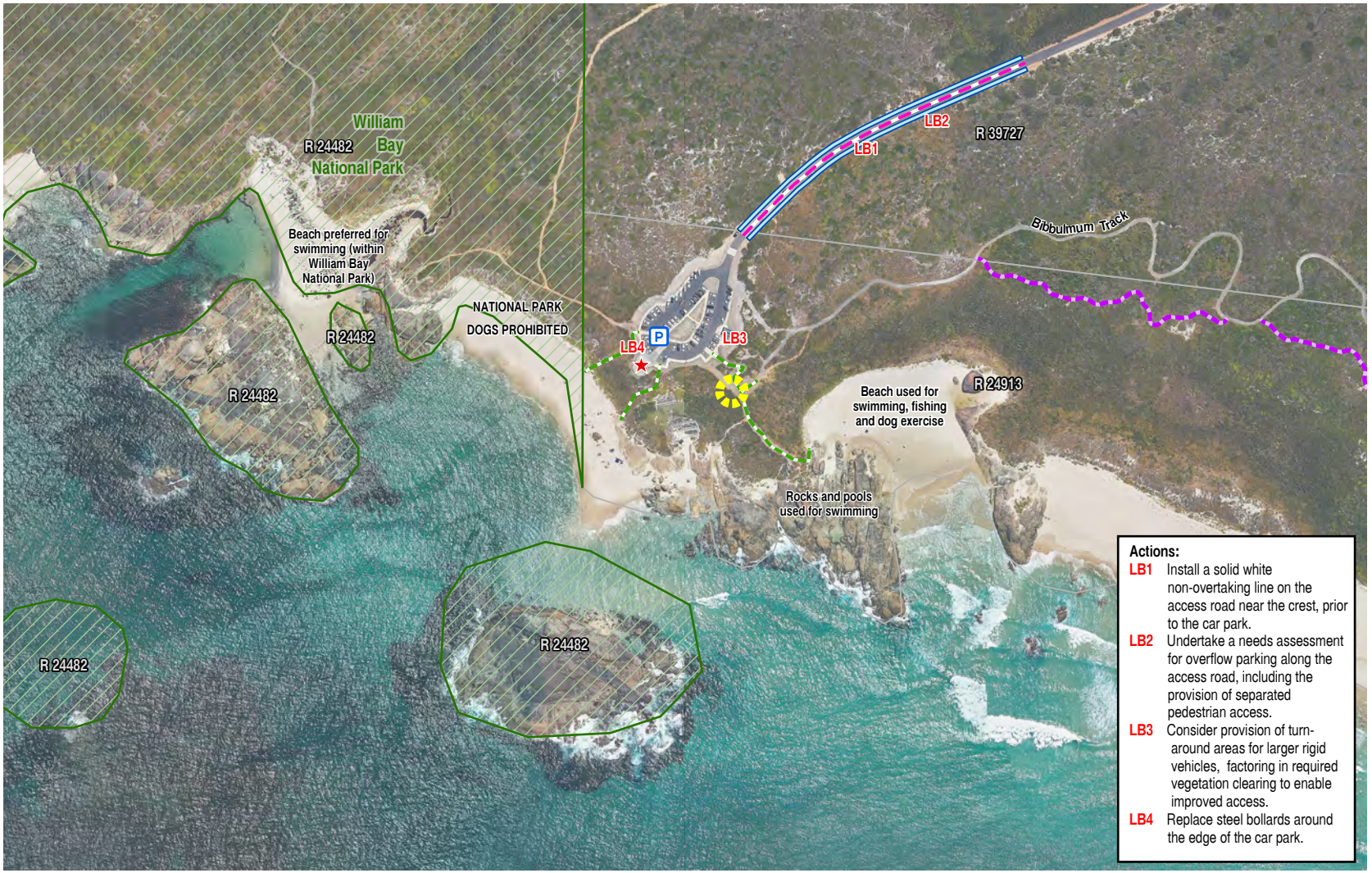
6.4 RECOMMENDED ACTIONS – LIGHTS BEACH

Table 6.2 – Lights Beach Actions

Action #	Description	Priority
LB1	Install a solid white non-overtaking line on the access road near the crest, prior to the car park	S
LB2	Undertake a needs assessment for overflow parking along the access road, including the provision of separated pedestrian access.	M-L
LB3	Consider provision of turn-around areas for larger rigid vehicles, factoring in required vegetation clearing to enable improved access.	M-L
LB4	Replace steel bollards around the edge of the car park.	M-L

Lights Beach car park

Stairs to beach from car park



Plan 6.1
Lights Beach (actions)
SHIRE OF DENMARK

7.0 Parry Beach & Hillier Beach

7.1 DESCRIPTION

PARRY BEACH

Parry Beach Reserve, situated 25km west of Denmark between William Bay National Park and Quarram Nature Reserve, encompasses three primary recreation sites:

- **Parry Inlet**: Located at the northern end, this site at the inlet's mouth features a small parking area and a lookout.
- **Parry Beach**: Positioned south of the inlet, this area includes a small camping and caravan park, professional fishermen shacks, and beach access.
- **Hillier Beach**: Found at the southern end, this section comprises 4WD tracks, small car parking areas, lookouts, and beach access.

The primary recreational beach area spans approximately 1km from the inlet's mouth, extending southerly before transitioning into a landscape of granite hills and rocky outcrops.

Managed by the Parry Beach Voluntary Management Group in collaboration with the Shire of Denmark, a low-key camping ground on the reserve offers 40 tent/caravan sites, with an additional 10 for seasonal overflow. The well-maintained site, nestled among Peppermint trees, features two toilet blocks and shower facilities. Operated by local volunteers and resident campers, the camping spots operate on a first-come-first-served basis, regulating the number of occupants.

To the northeast of the camping ground, discreetly positioned behind fore-dunes, are a few shacks occupied by professional fishermen during the salmon fishing season. Fishing activities, including abalone and shark fishing, are conducted throughout the year, with the peak season from February to April. The area between Point Hillier and William Bay National Park is a Proclaimed Fishing Area under the *Fish Resources Management Act 1994*, leased to a local professional fisherman. The shared use of Parry Beach Reserve between commercial fishing and general recreation has historically experienced no significant conflicts.

Also popular for amateur fishing, Parry Beach sees activities such as swimming, surfing, walking, fishing, and boating. Mulloway and Salmon are common during high tide, attracting both tourists and local residents. The Bibbulmun Track traverses the Parry Beach Reserve, extending along Mazzoletti Beach to William Bay National Park.

HILLIER BEACH

The management challenges at Hillier Beach are relatively minimal, thanks to the site's low-key atmosphere. Access to the beach is via unpaved road and a 4WD sand track. Some small parking areas are situated along these tracks, and provide scenic views towards the ocean.

7.2 PARRY BEACH TENURE

Table 7.1 – Parry Beach Tenure

Reserve Details	Description
Parry Beach Reserve – 20928 (Lots 303 and 304 on P49014)	This reserve is 205ha and is also classified as a Class 'A' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Camping and Recreation.
Parry Beach Reserve – 50244 (Lots 305 and 306 on P49014)	This reserve is 0.1ha in size and is a long strip of land located at the northern end of the Parry Beach Reserve Study Area branching either side from Parry Road. It is classified as a Class 'C' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Drainage.
Parry Beach Reserve – 36578 (Lots 307 and 308 on P49014)	This reserve is 3.3ha and is also classified as a Class 'C' reserve. It is located at the southern end along Parry Road. The management orders are with the Shire of Denmark and the current purpose is listed as Caravan Park.

Reserve Details	Description
Parry Beach Reserve – 39668 (Lot 7553 on P186775)	This reserve is 15ha and is located at the southern end of the Parry Beach Reserve Study Area, to the west of Hillier Beach. It is classified as a Class 'C' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Quarry Site.

7.3 ISSUES AND OPPORTUNITIES

Parry Beach Reserve is well managed by the Parry Beach Voluntary Management Group, with a range of management solutions are already in place to minimise potential impacts on the environment. Many of the recommended actions from the 2011 CRMP have also been implemented.

PARRY INLET

The Parry Inlet site consists of a small parking area for day visitors and a lookout area which is situated a short walk from the car park through surrounding vegetation. It is noted that visitors sometimes camp informally at the lookout site, which is illegal, unhygienic (lack of toilets) and environmentally damaging. This act should be discouraged by increased Shire Ranger monitoring of the area.

PARRY BEACH

Parry Beach is a popular destination for various recreational activities, such as swimming, surfing, fishing, walking, boating, dog exercise, and 4WD driving. However, managing and balancing these diverse uses to avoid conflicts and ensure safety of all coast users is a key challenge. This challenge was identified in the previous iteration of the Coastal Recreation Management Plan (CRMP) and remains relevant today.

One of the main issues is the vehicular access to the beach, which is used by many people to reach fishing and surfing spots. However, the western part of the beach is relatively narrow and also frequented by pedestrians and other recreational users, which poses some safety risks. The previous CRMP recommended separating the pedestrian and vehicular movement on the access track to the beach, which has improved the safety of people accessing the beach for recreational purposes. This issue is probably as resolved as it now can be, without developing additional pedestrian access ways across the dunes (leading to a range of other issues).

There is also potential conflict between different activities on the beach, such as swimming, general recreation, boat launching/retrieving, and 4WD driving. The safety of individuals on the beach is the primary objective of this management plan, and it requires managing and regulating vehicle use (including boating) to prevent accidents and injuries.

It should be noted that the current vehicular access to the beach is the only feasible option, as the coastal hazard assessment (refer Appendix B) has shown that there are no viable stable or environmentally sensitive alternatives for a secondary access. Therefore, the current access will be maintained for the foreseeable future.

However, this also means that management of vehicle use may be necessary, especially during peak periods, when the beach experiences high congestion and resultant potential safety risks. Options for managing these restrictions have been based on extensive consultations with key stakeholders and a thorough review of possible management responses. The proposed actions include:

- Managing vehicle speeds in multi-use areas through temporary signage and traffic calming measures at peak periods
- Limiting vehicle and boat trailer parking on the beach during peak periods
- Establishing a protocol to further manage vehicular traffic at specific times.

Parry Beach is home to various beach-nesting bird species, such as the Hooded Plover. These birds may nest on the beach during peak recreational times, and their nesting sites may be disturbed or damaged by 4WDs and dogs. To protect these birds and their habitats, it is recommended to conduct regular inspections of critical nesting sites during the breeding season. If nesting birds are found on the beach, temporary barriers should be set up to mark their presence and prevent further disturbance. The barriers should also inform the public about the reason and request that vehicles, people, and dogs keep a safe distance from the nesting areas. Additionally, improved signage at Parry Beach could raise awareness and encourage environmentally responsible behaviour among visitors.

HILLIER BEACH

Issues relating to Hillier Beach largely relate to dune disturbance from vehicles and pedestrians that divert from the current tracks. The beach access to Hillier Beach has recently been upgraded by the Shire, and this should be maintained over time.

The Hillier Beach car park has limited capacity, and when the car park is full; there is no easy way for vehicles to turn around and leave the site, and this requires some vehicles to drive into adjoining vegetation to turn back towards Parry Beach. The blockage also raises emergency access concern.

The recommended response is that the Shire install a small turnaround (including keep-clear signage) at the end of the Hillier Beach car park, and place visible bollards around the access/parking area to restrict vehicle access to the surrounding vegetation.

7.4 RECOMMENDED ACTIONS – PARRY BEACH AND HILLIER BEACH

Table 7.2 – Parry Beach and Hillier Beach Actions

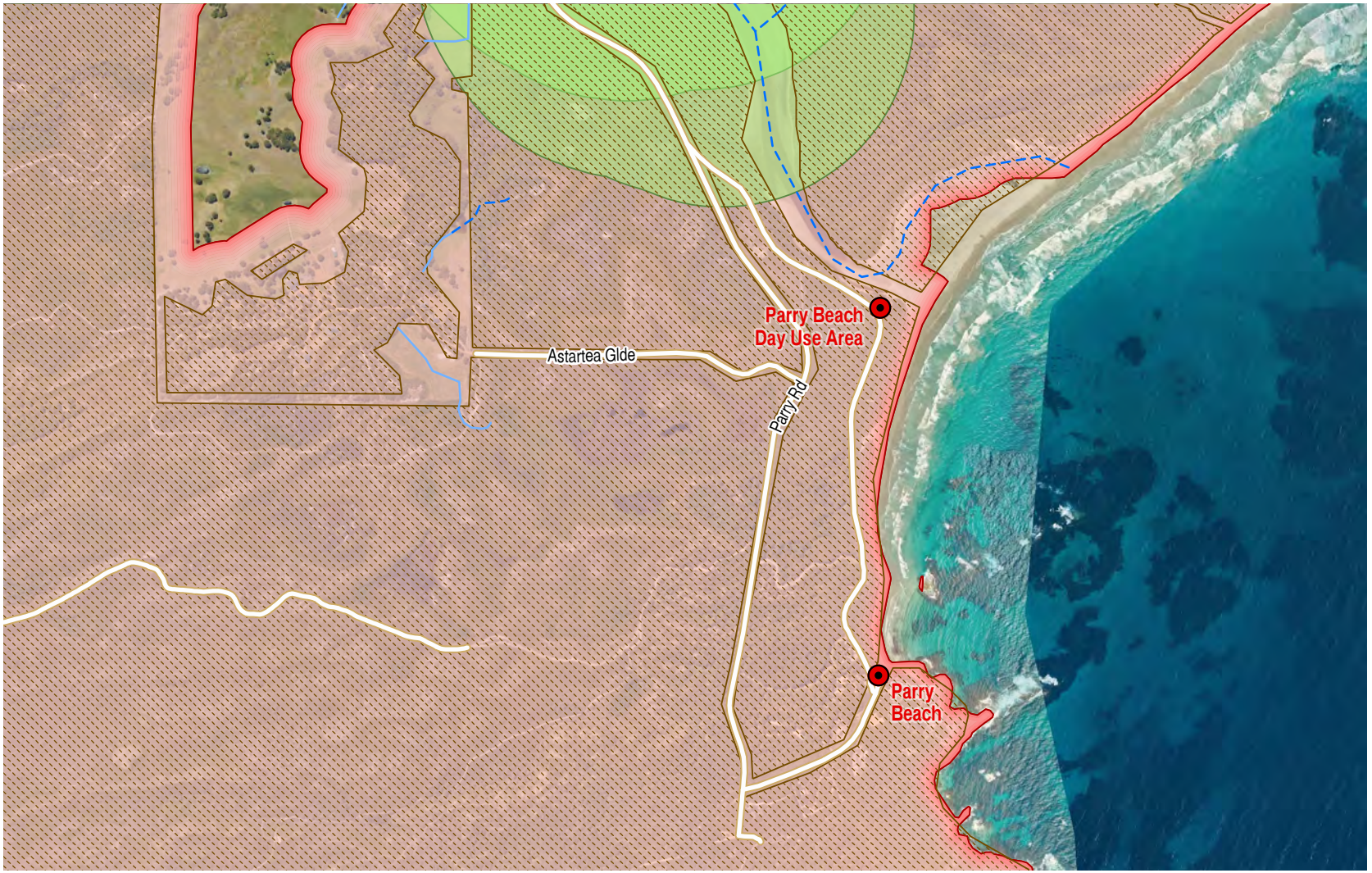
Action #	Description	Priority
Parry Beach		
PB1	Regularly inspect carpark.	S
PB2	Undertake beach inspections to identify nesting birds at appropriate times. Should nests be identified, install temporary fencing and/or signage to discourage 4WD and dogs from the areas.	O
PB3	Formalise access from lookout to Inlet (no vehicle access).	M
PB4	Create a low-key day use area.	M
PB5	Continue to allow limited vehicle access to rocky area.	O
PB6	Limit speeds in this multi-use zone. Consider use of temporary speed signage and traffic calming.	S-O
PB7	Maintain restricted access to Fisherman Lease area.	O
PB8	Amalgamate R36578 and R39668 into Parry Beach Reserve.	M-L
PB9	Close and rehabilitate pathway.	M
PB10	Create a protocol to restrict or close the beach to vehicular traffic during peak use periods - Easter and Christmas.	S-O
Hillier Beach		
PB11	Upgrade carpark and install bollards to prevent vegetation disturbance.	S
PB12	Maintain stairs and beach.	O
PB13	Install turnaround circle at end of access. Install no parking sign.	S

Hillier Beach; Parking and access

Plan 7.1
Parry Beach - Tenure
SHIRE OF DENMARK

Plan 7.2
Parry Beach - Heritage
SHIRE OF DENMARK

SD 1118-004-02-02 Parry Beach - Heritage



Beach
Native Vegetation Extent
Threatened Ecological Communities
Bushfire Prone Area

Roads
Highway
Main Road
Local Road

Rivers and Waterways
Minor River - Non Perennial
Unclassified

N
0 150 300 450 600 750
Metres

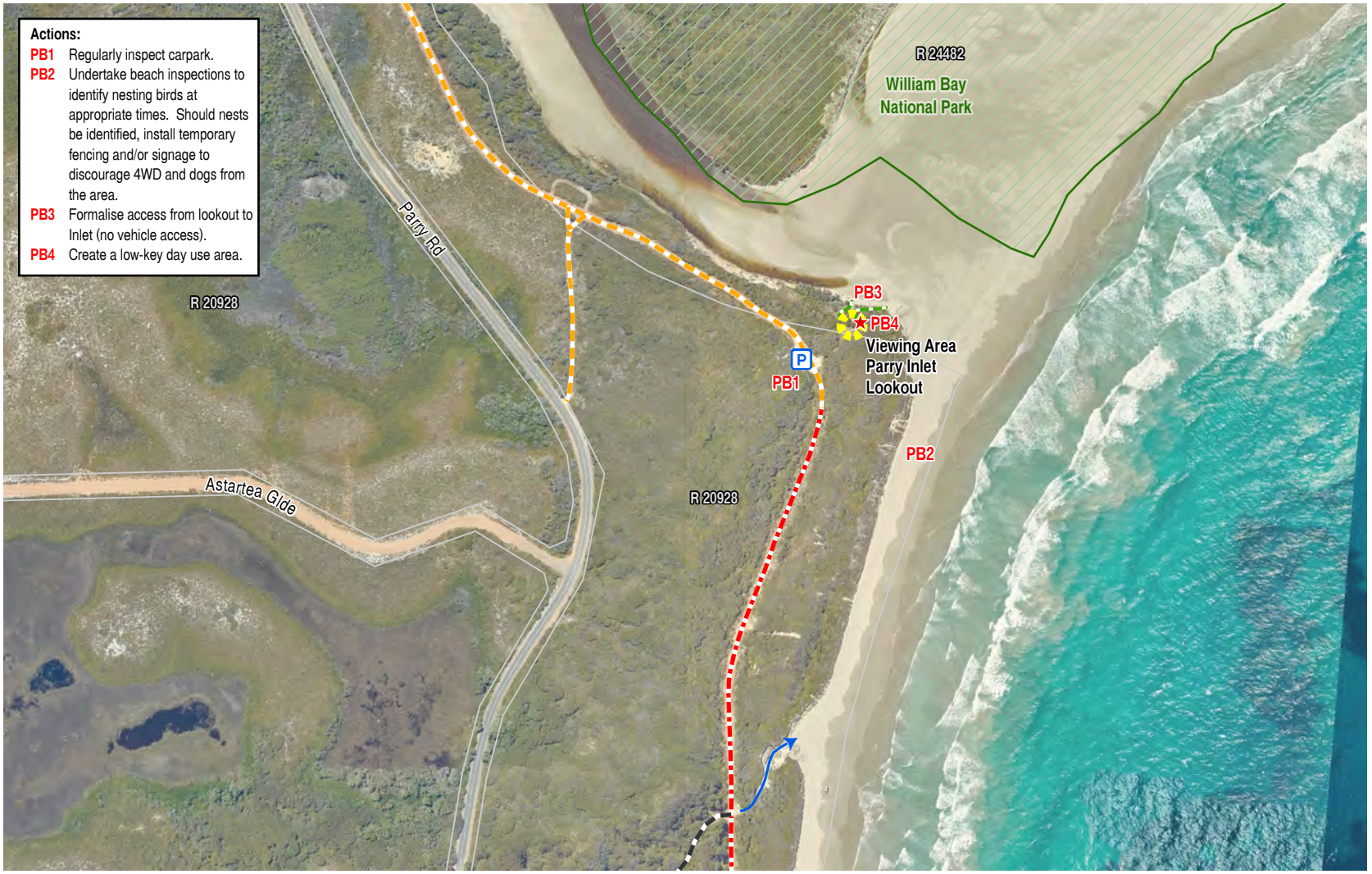
Plan 7.3
Parry Beach - Environmental
SHIRE OF DENMARK

SD 1118-004-03-02 Parry Beach - Enviro

Parry Beach; Beach access; Campground in background

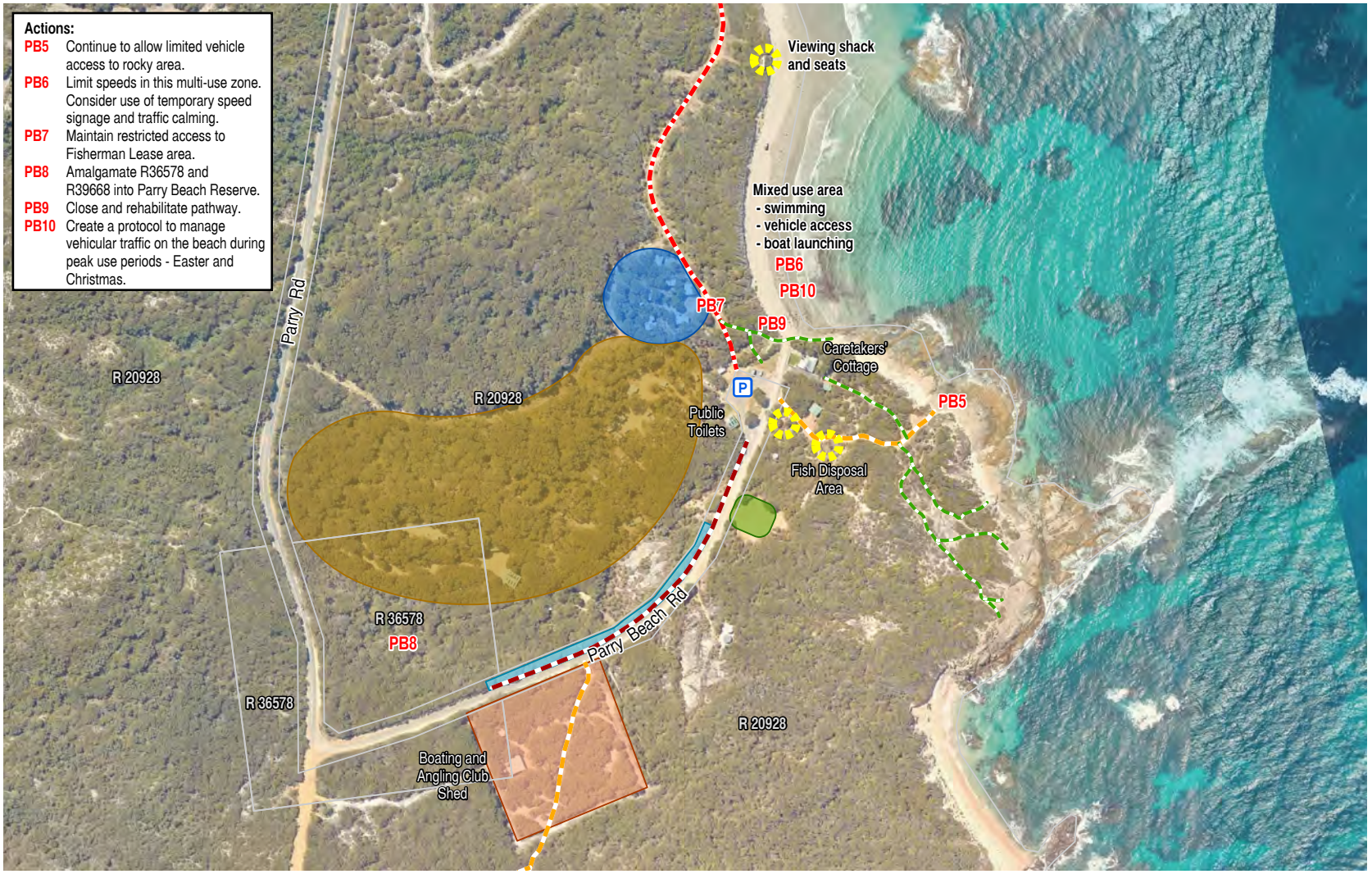
Parry Inlet

Parry Beach day use area and emergency vehicle access



SD 1118-007-06-01 Parry Inlet N

Plan 7.4
Parry Inlet North (actions)
SHIRE OF DENMARK



Plan 7.5
Parry Beach South (actions)
SHIRE OF DENMARK

SD 1118-007-07-01 Parry Beach S

Plan 7.6
Hillier Beach (actions)
SHIRE OF DENMARK

8.0 Boat Harbour

8.1 DESCRIPTION

Boat Harbour Reserve is a 200m wide natural harbour located 30km west of the Denmark townsite, between two nature reserves managed by the Department of Biodiversity, Conservation and Attractions (DBCA). It is the smallest and least accessible Shire coastal reserve, offering limited amenities and experiencing lower visitation due to seasonal track inaccessibility.

The reserve features a scenic and sheltered sandy beach flanked by granite headlands, which provides a popular spot for fishing and picnicking. It also provides for occasional emergency boat launches by Denmark and Peaceful Bay Sea Rescue Groups. The reserve has a small car park and picnic facilities on the western side, as well as a recently established composting toilet near the beach.

The reserve is also home to a low swampy plain inhabited by wetland plant species, such as *Agonis juniperina*, *Banksia littoralis*, and *Melaleuca preissiana*. The Bibbulmun Track, a long-distance walk trail, traverses the reserve and features an overnight hut managed by the DBCA with support from Friends of Bibbulmun Track.

Access to the reserve is via a sand and gravel track extending through Quarrum Nature Reserve, which is only accessible to 4WD vehicles due to potential wet and boggy conditions during winter and deep sand in certain areas. The track was historically upgraded in the 1970s to facilitate access for professional fishermen, but it now requires urgent short-term management due to its deteriorated state. Unauthorised illegal camping on the eastern side of the reserve is also an issue that needs to be addressed.

8.2 TENURE

Table 8.1 – Boat Harbour Tenure

Reserve Details	Description
Boat Harbour Reserve – 7723 (Lot 7594 on P91575)	Boat Harbour Reserve is the smallest study area at 59ha and is classified as a Class 'C' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Recreation and Foreshore Protection. This vesting order term expires on 30 April 2012.

8.3 ISSUES AND OPPORTUNITIES

Boat Harbour is a remote reserve with challenging access, which subsequently attracts fewer visitors than other reserves in the Shire. This has resulted in lower priority for management, however, the reserve faces several issues that threaten its environmental integrity, such as:

- Deviation from pedestrian footpaths and vehicle tracks causes damage to the vegetation and dunes
- Illegal camping, causes the removal of vegetation for firewood, the discarding of rubbish in vegetation, and other impacts that require additional compliance checks and enforcement
- Uncontrolled 4WD access on granite headlands and rocks, which disturbs the natural features and habitats
- Expansion of the north-eastern dune blow-out near the bay, which poses a threat to the access track and inland areas, and requires urgent rehabilitation efforts

One possible option to address the illegal camping issue is to formalise a discreet camping area near the bay, but this option requires thorough investigation by the Shire and is not currently recommended.

The access track, Boat Harbour Road, is also in a poor condition and requires immediate upgrading and management. The main concerns are:

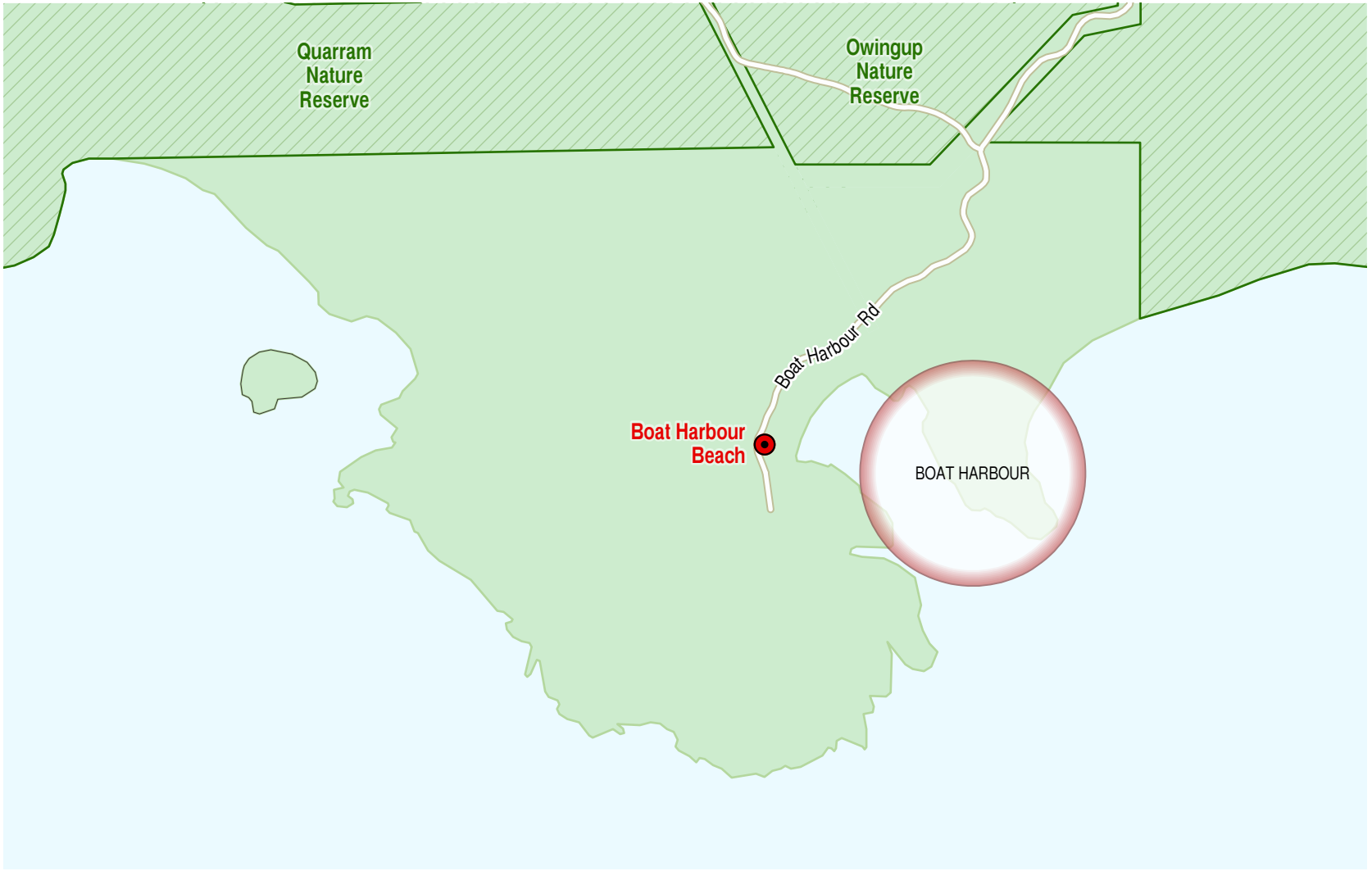
- The narrow width of the track in certain areas, which requires pruning of surrounding vegetation
- The presence of blind corners without warning signs, which poses a safety risk for drivers and pedestrians
- The damage caused by attempted 2WD access and bogged vehicles, which worsens the track condition and affects the environment

8.4 RECOMMENDED ACTIONS – BOAT HARBOUR

Table 8.2 – Boat Harbour Actions

Action #	Description	Priority
BH1	Retain Boat Harbour access track as sand.	O
BH2	Monitor track for safety issues undertake compliance checks for illegal camping.	O
BH3	Replace picnic furniture.	M
BH4	Close and rehabilitate side tracks.	O
BH5	Close duplicate 4WD tracks.	O
BH6	Install bollards near vegetation at parking areas.	S
BH7	Retain vehicle access to beach.	O
BH8	Install signage to advise of access restrictions, safety, removal of rubbish and responsible behaviour (including collecting firewood).	S
BH9	Rehabilitation for dune blow-out.	M
BH10	Implement seasonal closure of vehicle access track.	O
BH11	Undertake track rehabilitation maintenance and consolidation in the short term.	S
BH12	Liaise with Landgate to ensure that the Management Order of R7723 remains with the Shire.	S

Plan 8.1
Boat Harbour - Tenure
SHIRE OF DENMARK


Quarram Nature Reserve
Owingup Nature Reserve
Boat Harbour Rd
Boat Harbour Beach
BOAT HARBOUR
Beach
DBCA Managed Land
Aboriginal Heritage
Roads
Highway
Main Road
Local Road
N
0
100
200
300
400
500
Metres
landinsights
Plan 8.2
Boat Harbour - Heritage
SHIRE OF DENMARK
SD 1118-003-02-01 Boat Harbour - Heritage


Boat Harbour Rd
Boat Harbour Beach
Beach
Native Vegetation Extent
Bushfire Prone Area
Threatened Ecological Community - Priority
Roads
Highway
Main Road
Local Road
N
0
150
300
450
600
Metres
Plan 8.3
Boat Harbour - Environmental
SHIRE OF DENMARK
SD 1118-003-03-01 Boat Harbour - Enviro

Plan 8.4
Boat Harbour Reserve (actions)
SHIRE OF DENMARK

9.0 Peaceful Bay

9.1 DESCRIPTION

Peaceful Bay Reserve is the westernmost coastal reserve in the Shire, surrounded by the Walpole-Nornalup National Park on three sides. The reserve consists of three different lots, which include a leased village, essential community facilities, a camping and caravan park, and the coastal area under Shire management. Peaceful Bay is also an identified hotspot in Assessment of Coastal Erosion Hotspots in Western Australia (Seashore Engineering 2019), and has a CHRMAP prepared to address potential immediate and long-term erosion issues.

The reserve features a small embayment, Peaceful Bay, which is sheltered by a granite headland and a limestone barrier to the south. The beach north of Peaceful Bay extends to Denmark Inlet, providing vehicle access routes. Boat launching is available in front of the Sea Rescue Emergency building, while the western beach, now restricted with bollards, provides a safe family recreational area, in accordance with the Peaceful Bay Progress Association (PBPA) 5-stage plan.

The reserve also hosts a village and a resident population, which consists of small weatherboard cottages, occupied by retirees, permanent residents, and holidaymakers. The village, which is (generally) seasonally inhabited, has a caravan park, a general store, a local fire brigade, public amenities, a community hall, and a picnic area, mainly located to the south and southeast of the residences.

West of the village, freehold residential development has increased, making the townsite a future development area. The expected population growth, both permanent and visitor, is likely to increase the area usage, putting pressure on the facilities and the natural environment.

Peaceful Bay is a popular destination for various recreational activities, such as swimming, fishing, boat launching, dog exercise, picnicking, walking, and others. Camping on the beach areas is strictly prohibited, following the PBPA 5-stage plan that divides the beach into three sections for different activities.

Peaceful Bay Reserve has two designated car parks, one gravel at the northern end and one bituminised at the southern end, to accommodate different preferences. The southern car park also houses the Peaceful Bay Sea Rescue building, which provides essential facilities. Both car parks tend to reach their capacity during peak periods, and the demand is expected to increase with the growing permanent and visitor populations.

The bay is an ideal location for boat launching, as it is sheltered by the granite headland and the limestone barrier. Vehicle access to the bay is available from the northern car park. Boat launching is allowed within the designated northern section and further north along the reserve.

Next to the northward coast of the bay, there is a single fisherman's shack, leased by the Shire, and an RSL memorial. The northern end of the reserve is a Fishing Area, where professional fishing activities take place between February and April each year. The shacks are hidden behind the foredune, and the professional fishermen target salmon from February to March, herring in April and May, and shark throughout the year.

9.2 TENURE

Table 9.1 - Peaceful Bay Tenure

Reserve Details	Description
Peaceful Bay Reserve – 24510 (Lots 1423, 1424, 2229 on P240012)	The Peaceful Bay Reserve Study Area consists of a number of small lots which combine into the one reserve. A majority of the recreational land uses are contained on Lot 2229 which is approximately 83ha in size. The entire reserve is classified as a Class 'A' reserve. The management orders are with the Shire of Denmark and the current purpose is listed as Recreation, camping caravan park and holiday cottages.

9.3 ISSUES AND OPPORTUNITIES

Peaceful Bay is a well-utilised and favoured coastal destination, attracting both locals and visitors. The existing challenges arising from land use pressures and recreational activities have been effectively addressed through collaborative efforts involving the Shire, the local community, and the Peaceful Bay Progress Association. Many of the initiatives outlined in the previous Coastal Reserves Management Plan (CRMP) have been successfully implemented.

However, the potential for increased usage and associated pressures could lead to environmental and social value degradation if not appropriately managed, affecting the low-key, nature-based identity of the area. The Shire's primary focus is to oversee the area's management for the provision of safe, nature-based recreational facilities while preserving its understated, natural character. Key issues anticipated in the next decade, addressed by this plan, include:

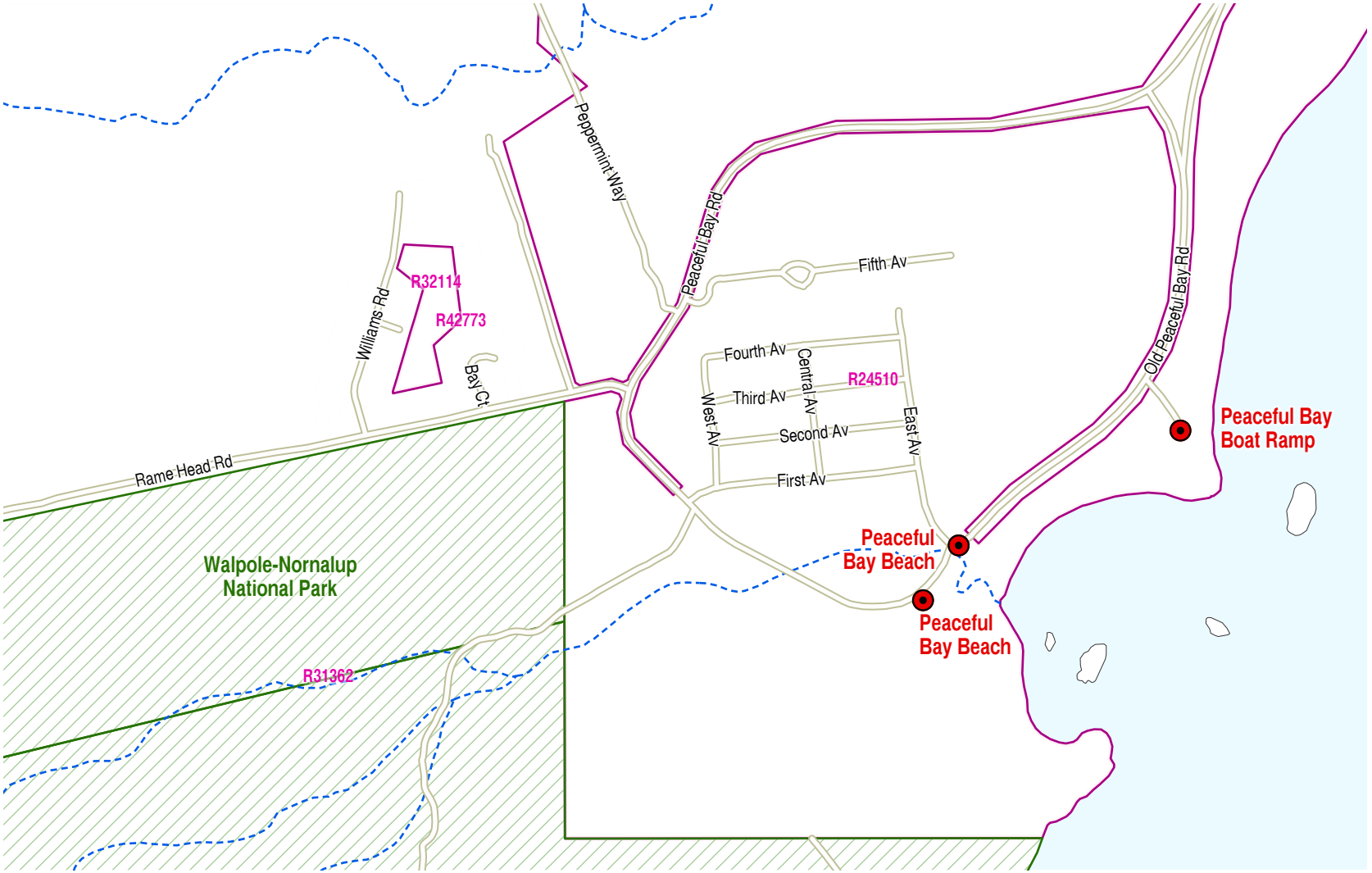
- The capacity of both car parks, which tend to reach their peak during high-demand periods, and the anticipated exacerbation of this issue. The plan proposes to monitor the car park usage and explore options for expansion or alternative parking solutions.
- The expected' escalation in permanent and visitor populations, which may prompt heightened demand for amenities such as toilets and showers. The divergent uses along the beach and distinct purposes of each car park present a logistical challenge, as people who rely on the northern car park for vehicle access currently have to travel to the other for restroom facilities. The plan recommends establishing new toilets at the northern car park to accommodate the projected demand.
- The safety concerns associated with vehicle use along the beach, which may conflict with other recreational uses. The plan suggests enforcing the separation of vehicle and pedestrian areas, as well as regulating the vehicle speed and access times.
- The instances of illegal camping in various locations, including the beach and DBCA-managed land. The plan advises increasing the compliance checks and enforcement, as well as improving the signage and education on the camping regulations.
- The vehicular actions on the beach, especially with regard to the impact on the environment and the wildlife. The plan recommends conducting regular inspections and assessments of the beach condition and the presence of any threatened or endangered species, as well as implementing measures to protect them.

Peaceful Bay is included within a sewage sensitive area under the Government Sewerage Policy (2019) and thus any wastewater treatment system should be connected to sewer where possible.

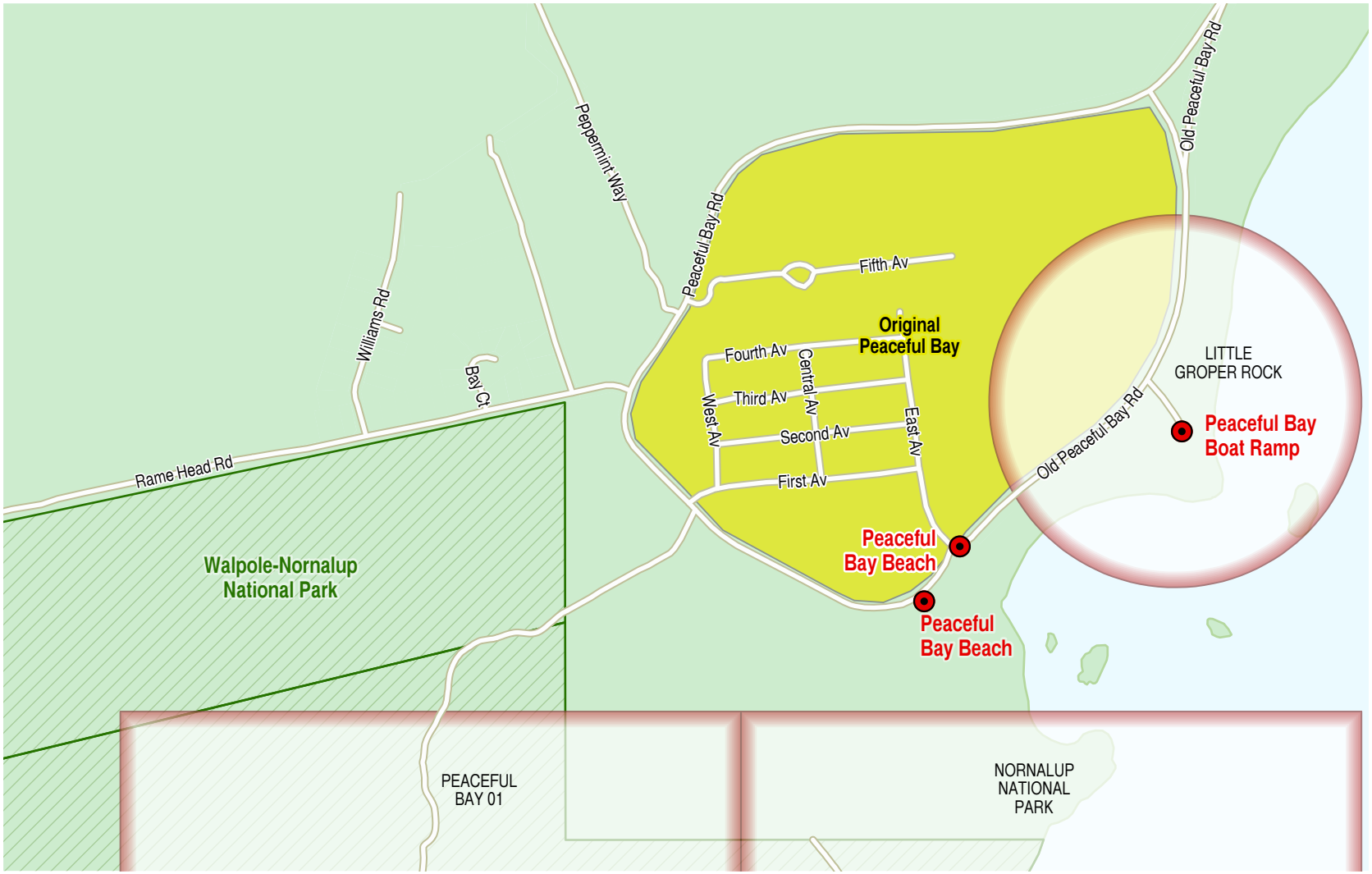
9.4 RECOMMENDED ACTIONS – PEACEFUL BAY

Table 9.2 - Peaceful Bay Actions

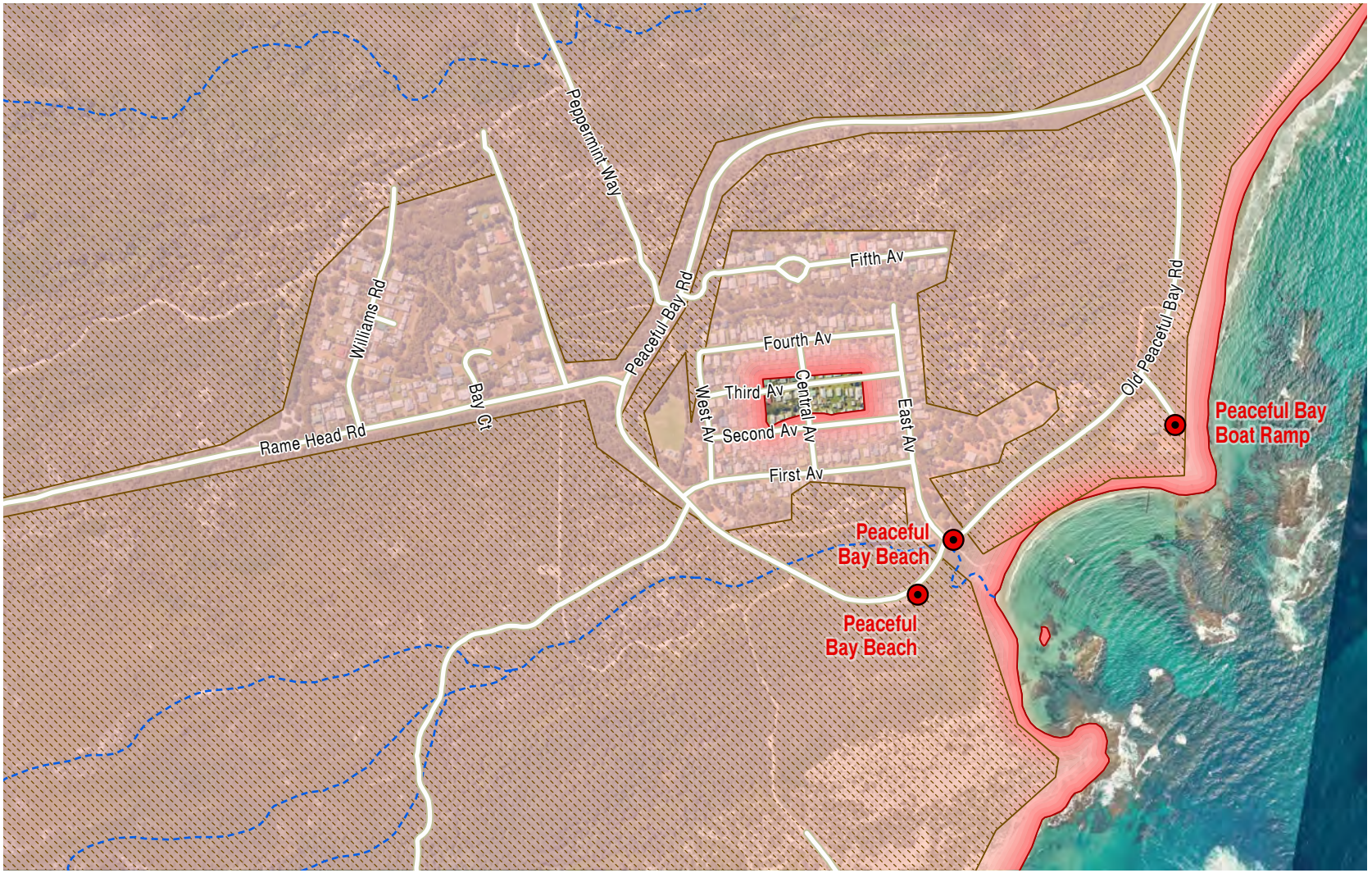
Action #	Description	Priority
PB1	Expand the western car park to cater for increased demand.	M
PB2	Erect safety signs regarding driving on the beach, and include a speed limit (e.g. 40km/h)	S
PB3	Replace signage at beach regarding different use zones so that it is clear and consistent.	S
PB4	Monitor vegetation and dunes for signs of disturbance and manage as appropriate.	O
PB5	Establish new toilet facilities at northern carpark.	M
PB6	Encourage boat trailer parking to be off beach, especially in peak periods.	S
PB7	Install signage to limit parking in this area for use by Sea Rescue only.	S
PB8	Maintain access at a usable level. Monitor and repair after erosion events	O
PB9	Implement speed limits on beach.	S
PB10	Monitor and rehabilitate where appropriate, dune degradation caused by 4WD vehicles.	O



Plan 9.1
Peaceful Bay - Tenure
SHIRE OF DENMARK



Plan 9.2
Peaceful Bay - Heritage
SHIRE OF DENMARK



Plan 9.3
Peaceful Bay - Environmental
SHIRE OF DENMARK

SD 1118-002-03-01 Peaceful Bay - Enviro

Peaceful Bay panorama; May 2023

Peaceful Bay beach signage

Pedestrial beach access

Vehicular access

Plan 9.4
Peaceful Bay (actions)
SHIRE OF DENMARK

SD 1118-007-10-01 Peaceful Bay

10.0 Implementation

10.1 INTRODUCTION

This chapter outlines the implementation framework of the Coastal Reserves Management Plan, which aims to ensure adequate provision for coastal management in future budgets. Each action from the Coastal Recreation Management Plan (CRMP) will need to be estimated and scheduled by the responsible land managers, using the criteria of costs, resources and time (CRT).

10.2 PRIORITIES

The priority of each action is determined by the feedback from the stakeholders and the community, which indicated the issues and concerns that were high priority for them and should be addressed in the short to medium term, as well as the costs and the complexity of each action.

The actions with responsibilities assigned to the Shire are categorised into four priority levels:

- Short priority: These are the actions that are expected to be completed within the next 2 years, either through the Shire annual budget or through grant funded projects.
- Medium priority: These are the actions that are expected to be completed within the next 5 years, depending on the availability of funds and resources.
- Long-term priority: These are the actions that are expected to be completed in more than 5 years, as they require more planning and coordination.
- O: Ongoing – over life of the CRMP as required.

10.3 RESPONSIBILITIES

The implementation responsibilities vary depending on the coastal landowner or manager. The tenure and land managers responsible for each site were the main factors in determining the responsibilities. Some of the broader guiding principles and strategies identified in the Coastal Recreation Management Plan (CRMP) can be implemented by various parties, but the key site-specific actions are all the responsibility of the Shire.

10.4 MONITORING & REVIEW

Monitoring is a vital part of the Coastal Management Plan. It helps to evaluate the effectiveness of the suggested actions and to check if they have achieved the expected outcome. It can also reveal if the Plan needs any changes to meet the objectives more efficiently. The following aspects are relevant to monitor in the study area:

- Visitor numbers to sites, especially during peak periods
- The success of any rehabilitation
- The creation of new tracks and the extent of dune degradation
- The condition of facilities
- The condition of signs
- The cleanliness of coastal areas and the need for clean-ups
- Rate of any dune migration and coastal erosion.

The Shire should develop a Monitoring Plan that includes a process to describe the proposed review actions in this Plan and report on their progress. Monitoring should be done at least once a year, or more often for priority areas where management issues are present. Besides visual observation and reporting of coastal features, monitoring could use technology to measure the changes. For example, some locations can be selected to create a photo database (take photos at a certain site regularly over time to see the coastal changes) or an annual drone flight (to take photos of the coast from the air). Such technology (e.g. mobile apps) can facilitate monitoring by engaging community groups and 'citizen scientists'. These apps could also be used by the community (e.g. to inform the Shire of any urgent issues that may need to be addressed). Relevant actions such as weed control, re-vegetation, closure of tracks, replacement of signs and facilities, provision of a caretaker or ranger etc. should be scheduled better if monitoring results show no improvement or deterioration. The Shire is encouraged to involve the community where possible and where there is interest.

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

10.5 FUNDING SOURCES

Responsible land managers may be eligible for funding from other sources for certain activities. These funding opportunities tend to vary regularly and therefore a yearly review of

options is recommended. Projects and activities are more likely to be prioritised if they are identified in a Coastal Management Plan. Applications will generally need to demonstrate how the activities will benefit the environment and society and will need to provide details on the implementation, timeframes, costs and responsibilities of the activities. The following are some of the current sources of funding:

- Coastwest Grants Program (through the Department of Planning, Lands and Heritage)
- Coastal Management Plan Assistance Program (Department of Planning, Lands and Heritage)
- Coastal Adaptation and Protection (CAP) Grants (Department of Transport)(linked to the coastal erosion hotspot locations only)
- State Natural Resource Management (Department of Primary Industries and Regional Development)
- Tourism-oriented grants such as RAC, or Healthy WA active schemes.
- Recreational Boating Facilities Scheme (RBFS) grants (Department of Transport)
- Regional Grants Scheme (RGS) (Department of Primary Industries and Regional Development).

10.6 IMPLEMENTATION ACTIONS

Actions associated with Implementation are provided in Table 10.1 below.

Table 10.1 – Implementation Actions

Action #	Description	Priority
IA1	Prepare a Monitoring Plan which sets out a list of actions to review the outcomes of this Coastal Reserves Management Plan and their effectiveness. The Monitoring Plan should list timeframes/frequency of monitoring and responsibilities.	S
IA2	Prepare and Implement a simple Beach Monitoring Plan to regularly monitor (site visits and photography) key coastal locations to identify triggers for management identified throughout the CRMP.	S
IA3	Plan to undertake a review of this Coastal Reserves Management Plan within 10 years of its final adoption date.	L

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appendix a

survey results & outcomes report

Coastal Management Plan Review Community Survey

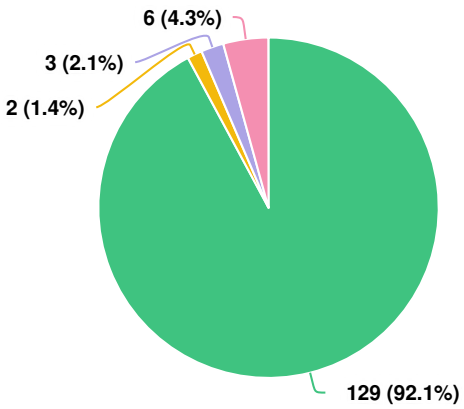
SURVEY RESPONSE REPORT
19 April 2023 - 01 June 2023

PROJECT NAME:
Coastal Management Plan Review

BANG THE TABLE engagementHQ

SURVEY QUESTIONS

Q1 What is your primary connection to the Shire of Denmark?

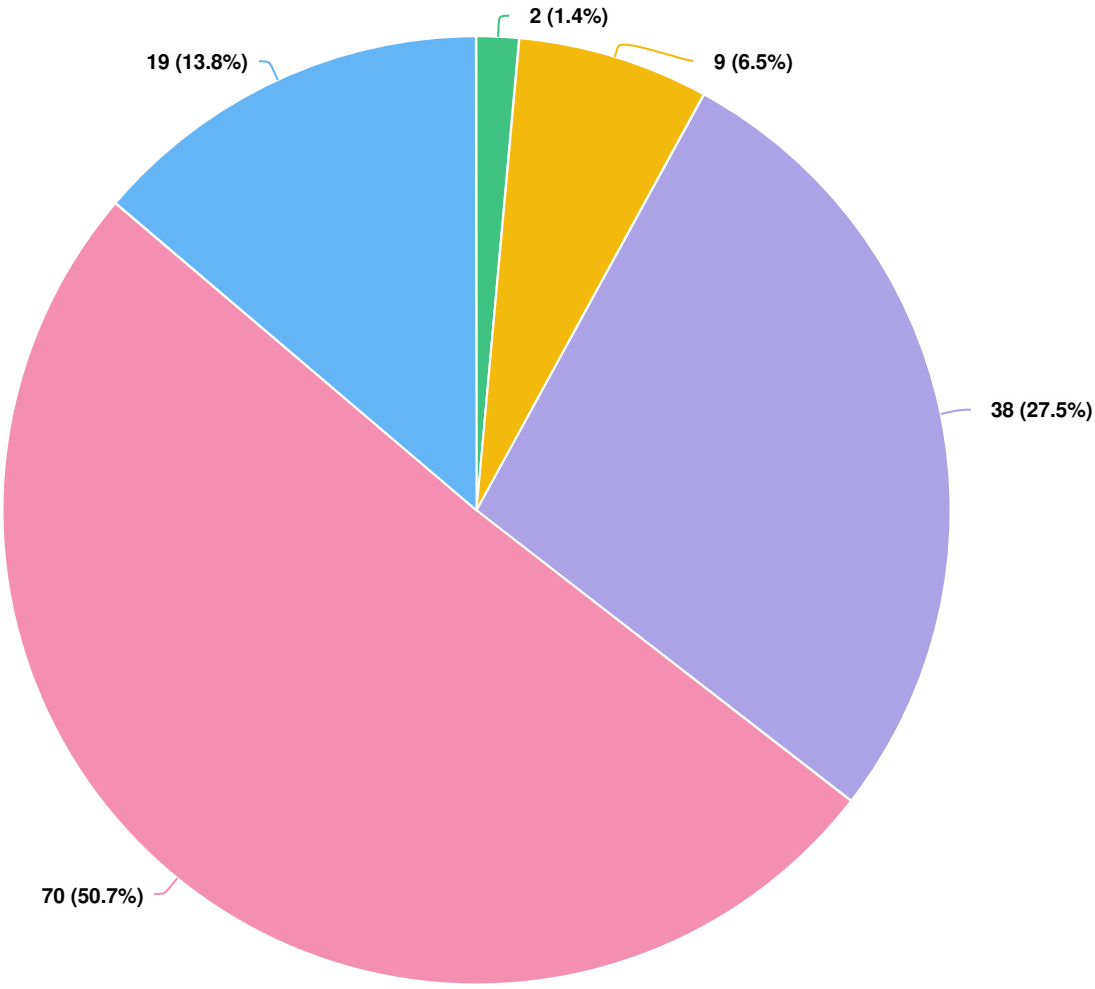


Question options

- I live in the Shire of Denmark
- I have a commercial interest in the Shire of Denmark
- I am a visitor to Shire of Denmark
- Other (please specify)

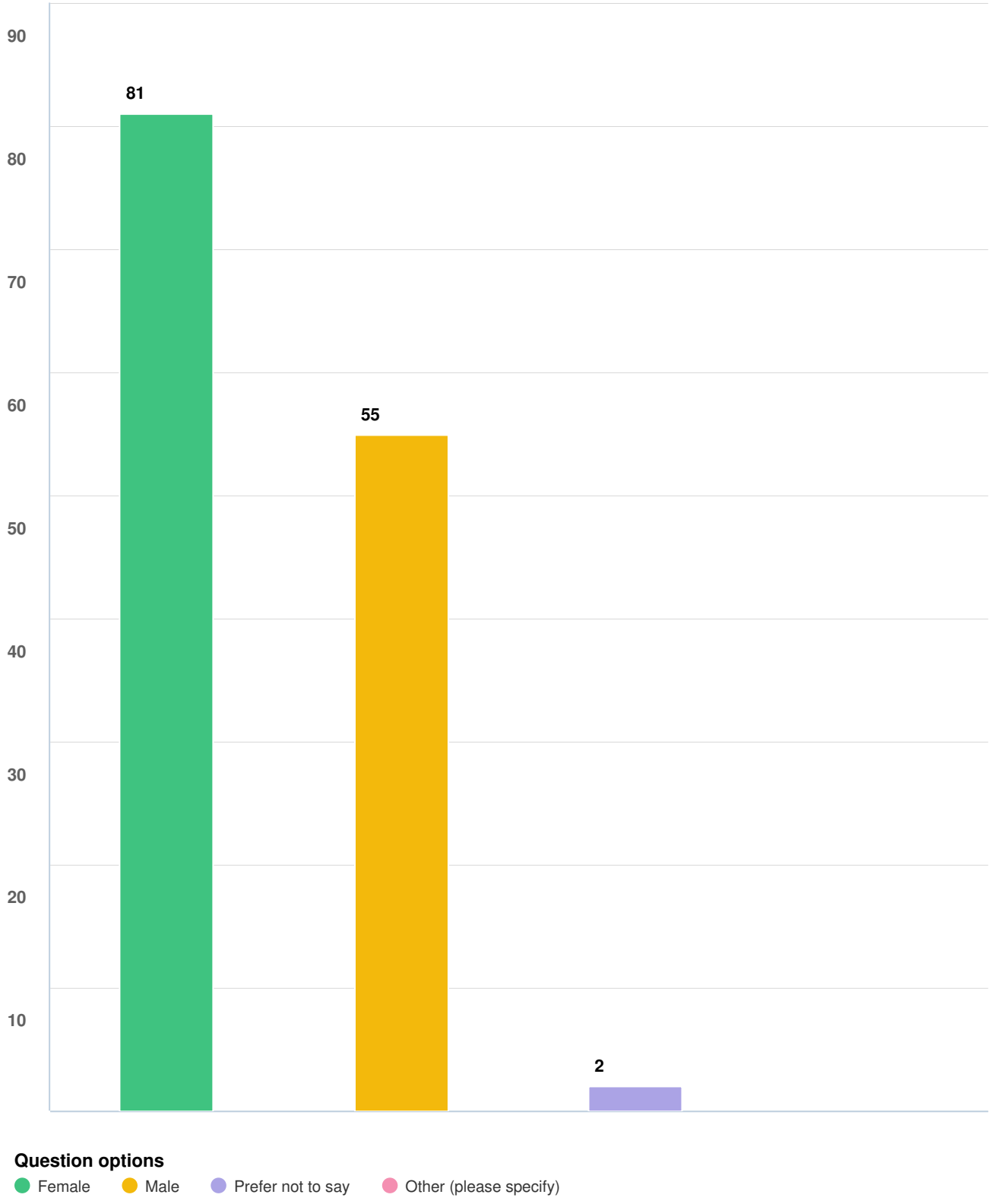
Mandatory Question (140 response(s))
Question type: Dropdown Question

Q2 Which age group are you in? (optional)



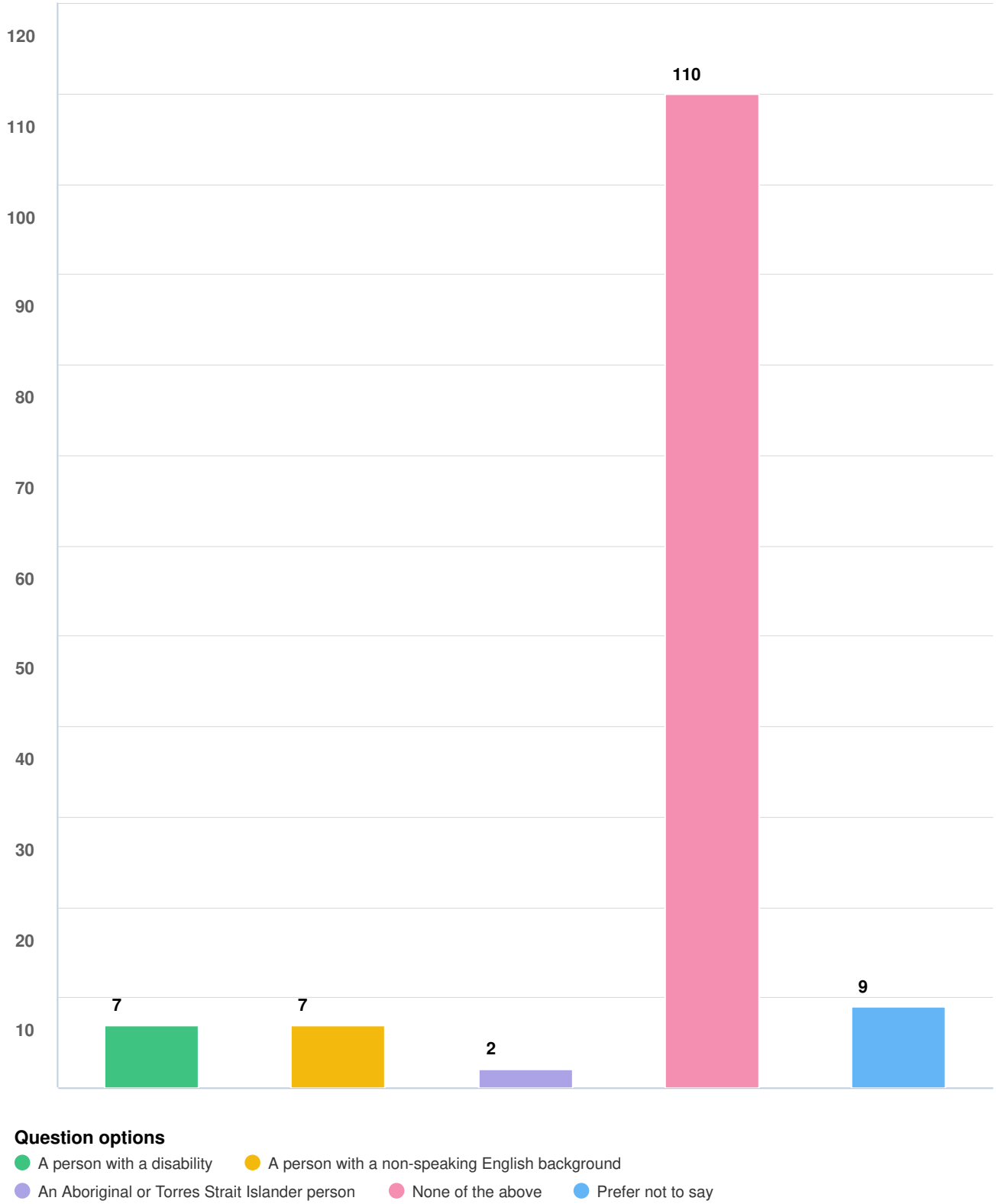
Optional question (138 response(s), 2 skipped)
Question type: Radio Button Question

Q3 What is your gender? (optional)



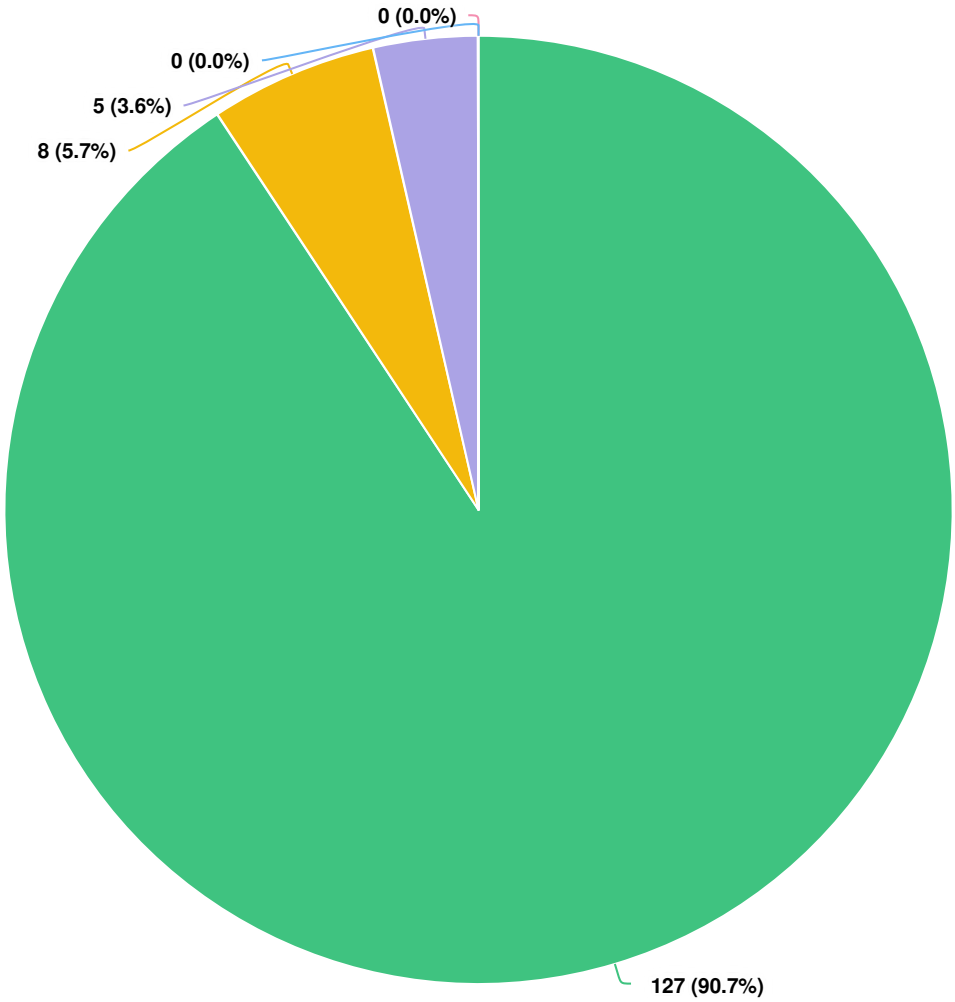
Optional question (138 response(s), 2 skipped)
Question type: Checkbox Question

Q4 Are you, or is anyone else in your household...? (optional)



Optional question (134 response(s), 6 skipped)
Question type: Checkbox Question

Q5 Where is your permanent residence?

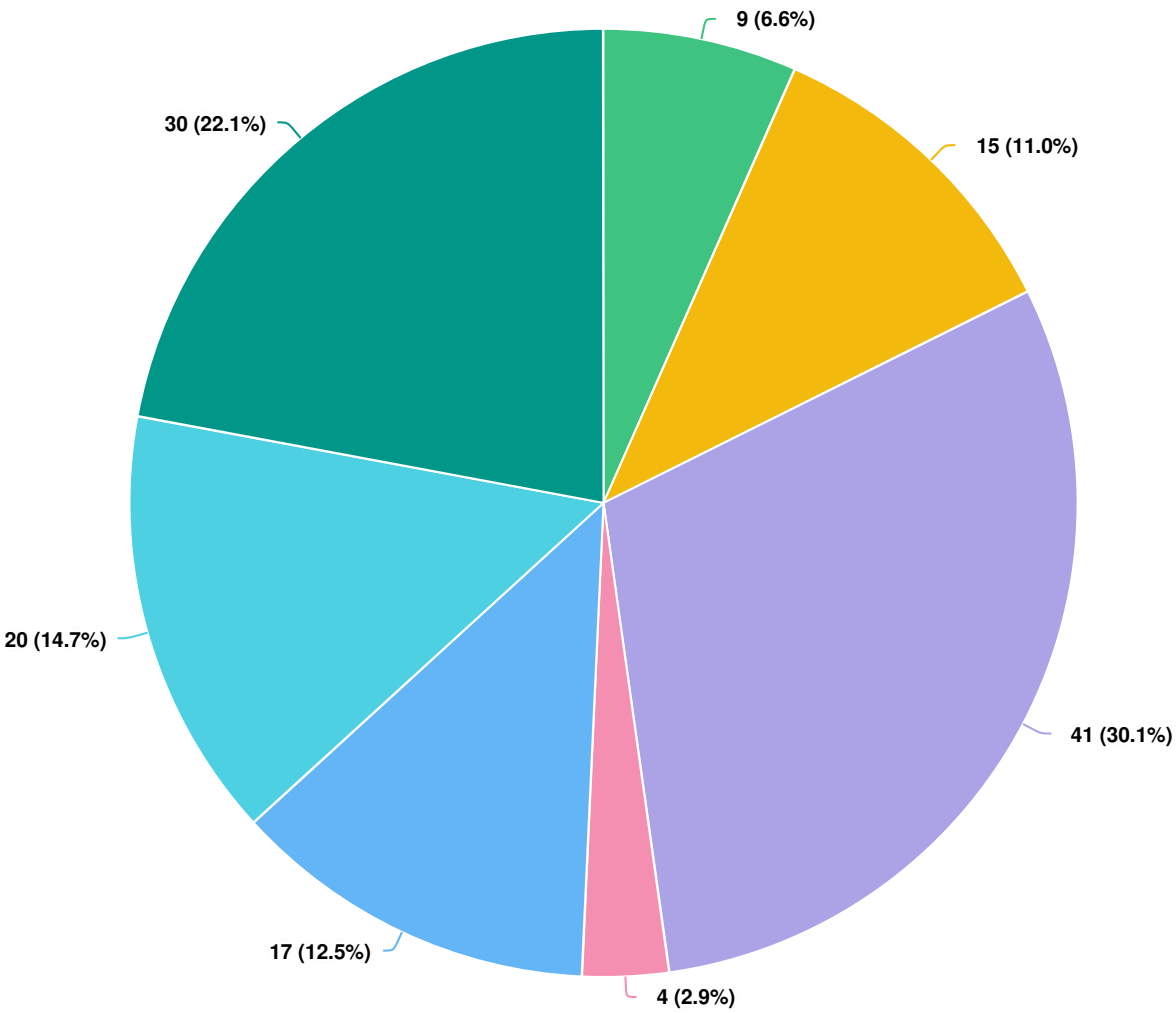


Question options

Shire of Denmark resident
Regional south coast WA (Manjimup; Plantagenet; Albany Shires)
WA wide
Australia (interstate)
Overseas

Mandatory Question (140 response(s))
Question type: Dropdown Question

Q6 How did you hear about the survey? (optional)

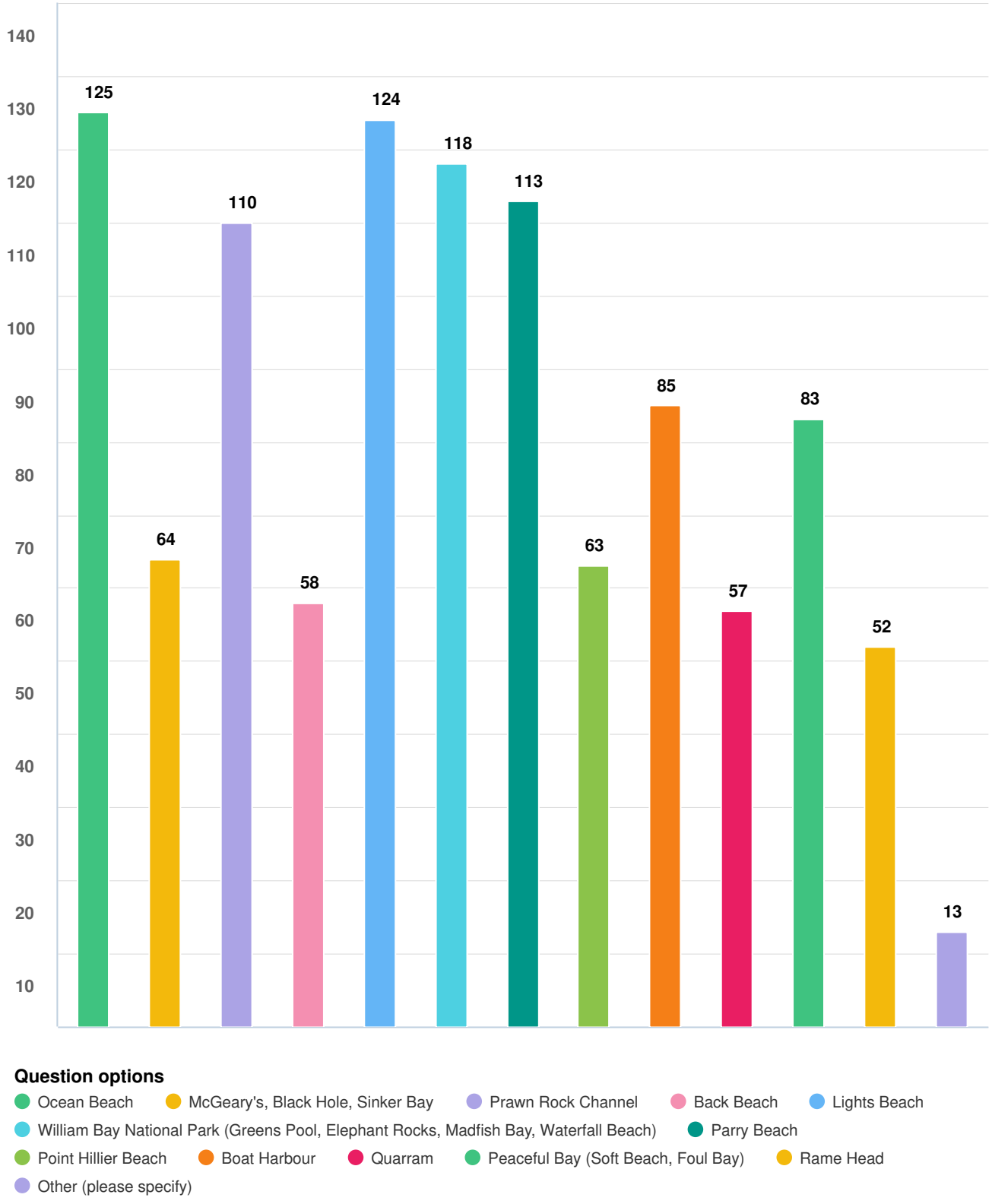


Question options

Denmark Bulletin | Shire website | Shire Facebook page | My Community Diary webpage | Community Noticeboard | Email | Other (please specify)

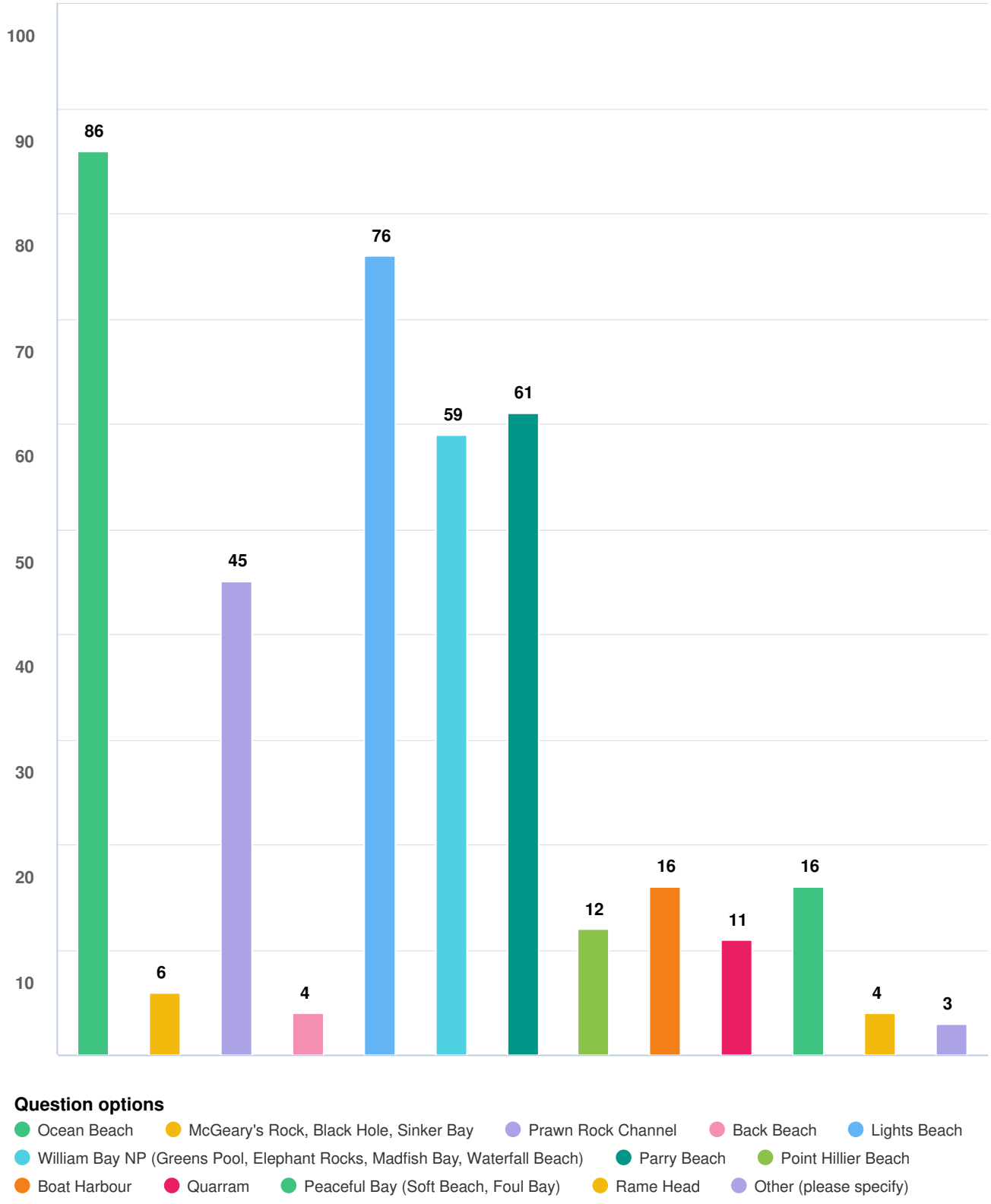
Optional question (136 response(s), 4 skipped)
Question type: Dropdown Question

Q7 Which beaches in the Shire of Denmark do you visit? (select all applicable)



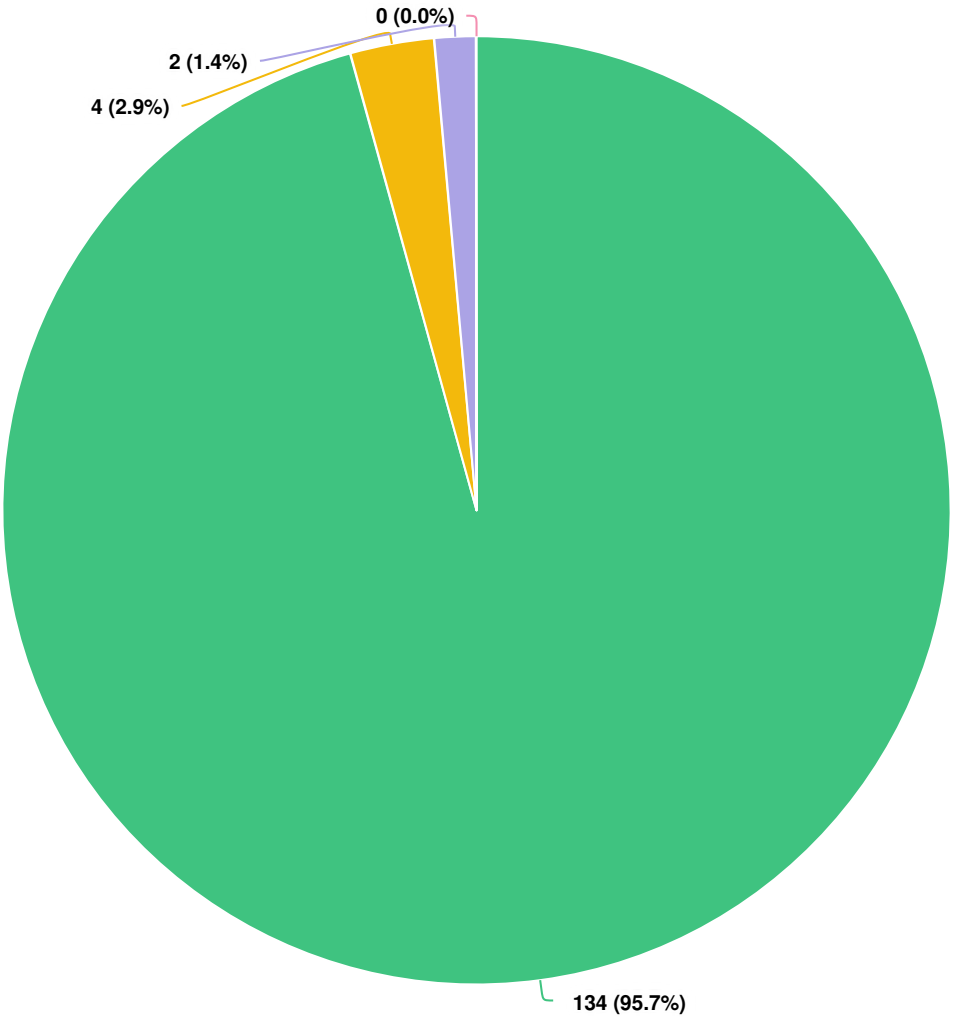
Mandatory Question (140 response(s))
Question type: Checkbox Question

Q8 What are your preferred beaches that you visit the most? (select your top 3)



Mandatory Question (140 response(s))
Question type: Checkbox Question

Q9 How do you usually get to your preferred beach?

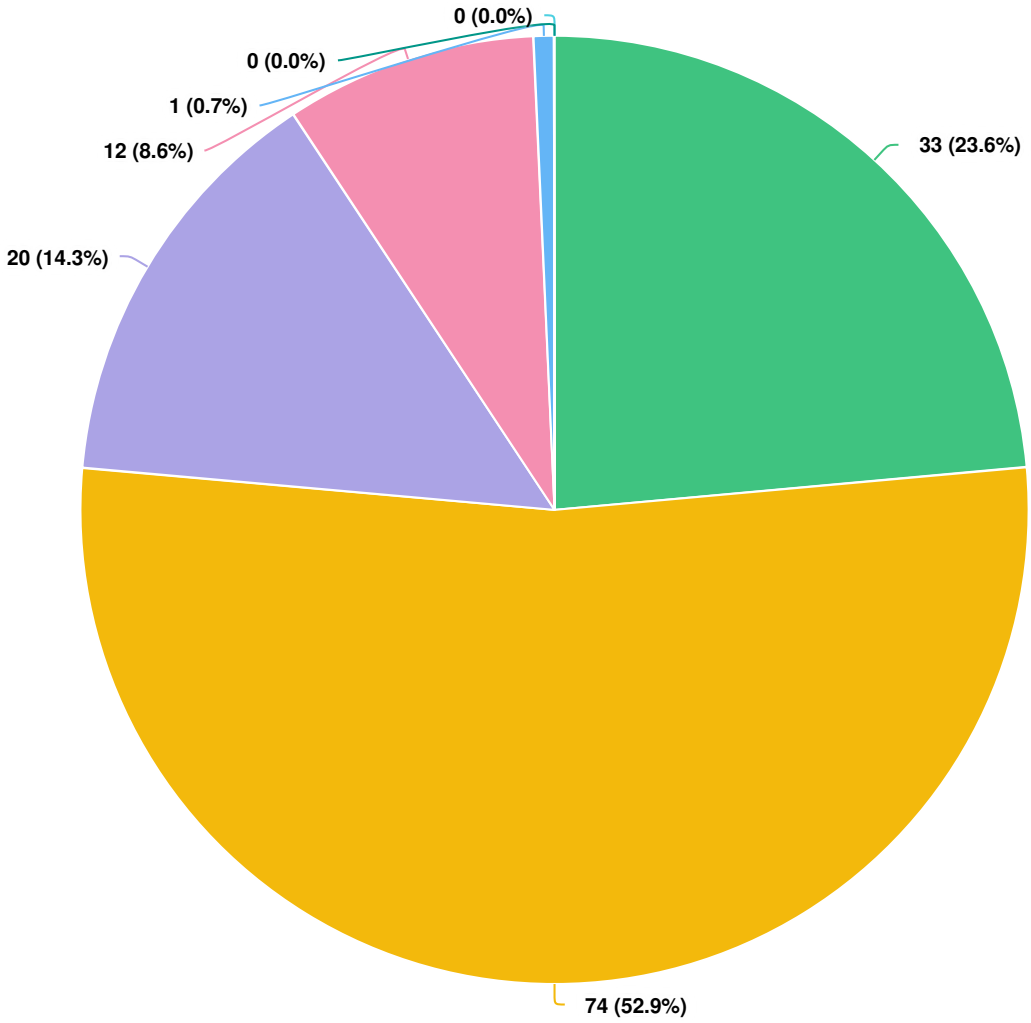


Question options

Drive Walk Cycle Other (please specify)

Mandatory Question (140 response(s))
Question type: Dropdown Question

Q10 How often do you visit your preferred beach?

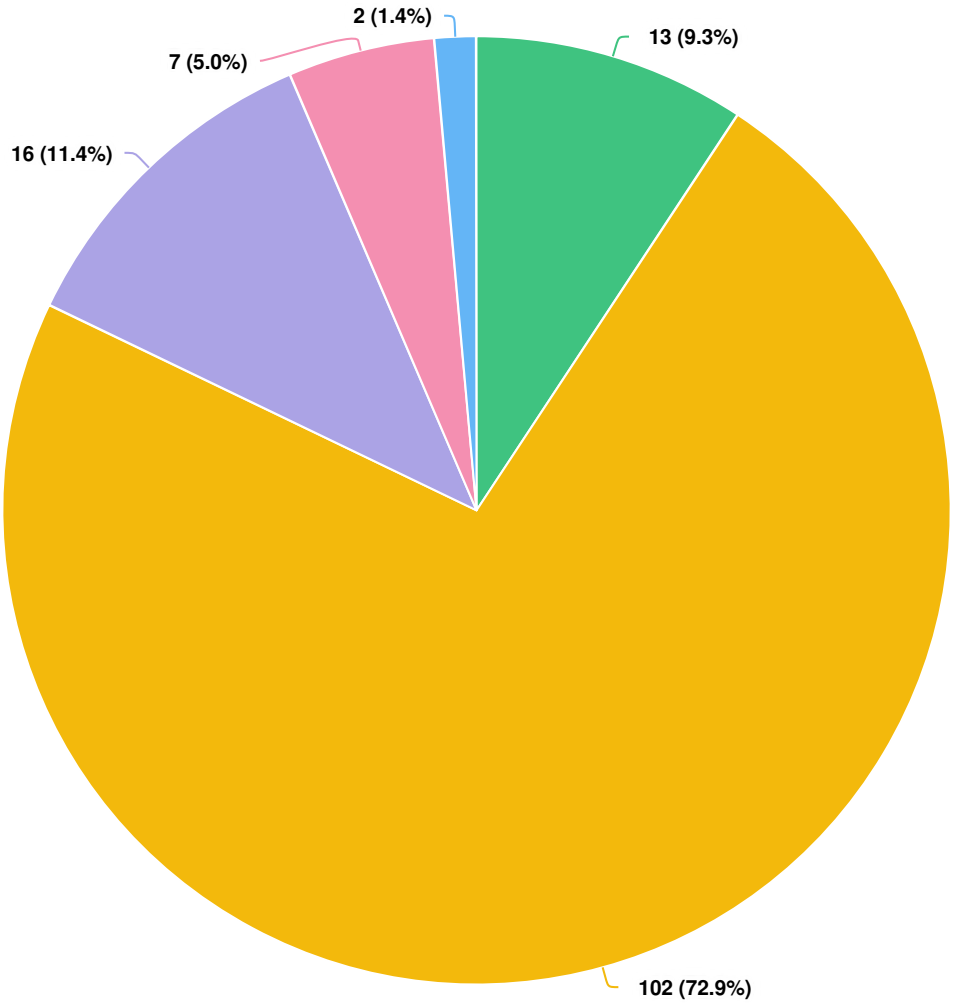


Question options

Daily Weekly Monthly Seasonally (eg. summer only) School holidays/ Public holidays Rarely Never

Mandatory Question (140 response(s))
Question type: Dropdown Question

Q11 How long do you normally stay at your preferred beach?

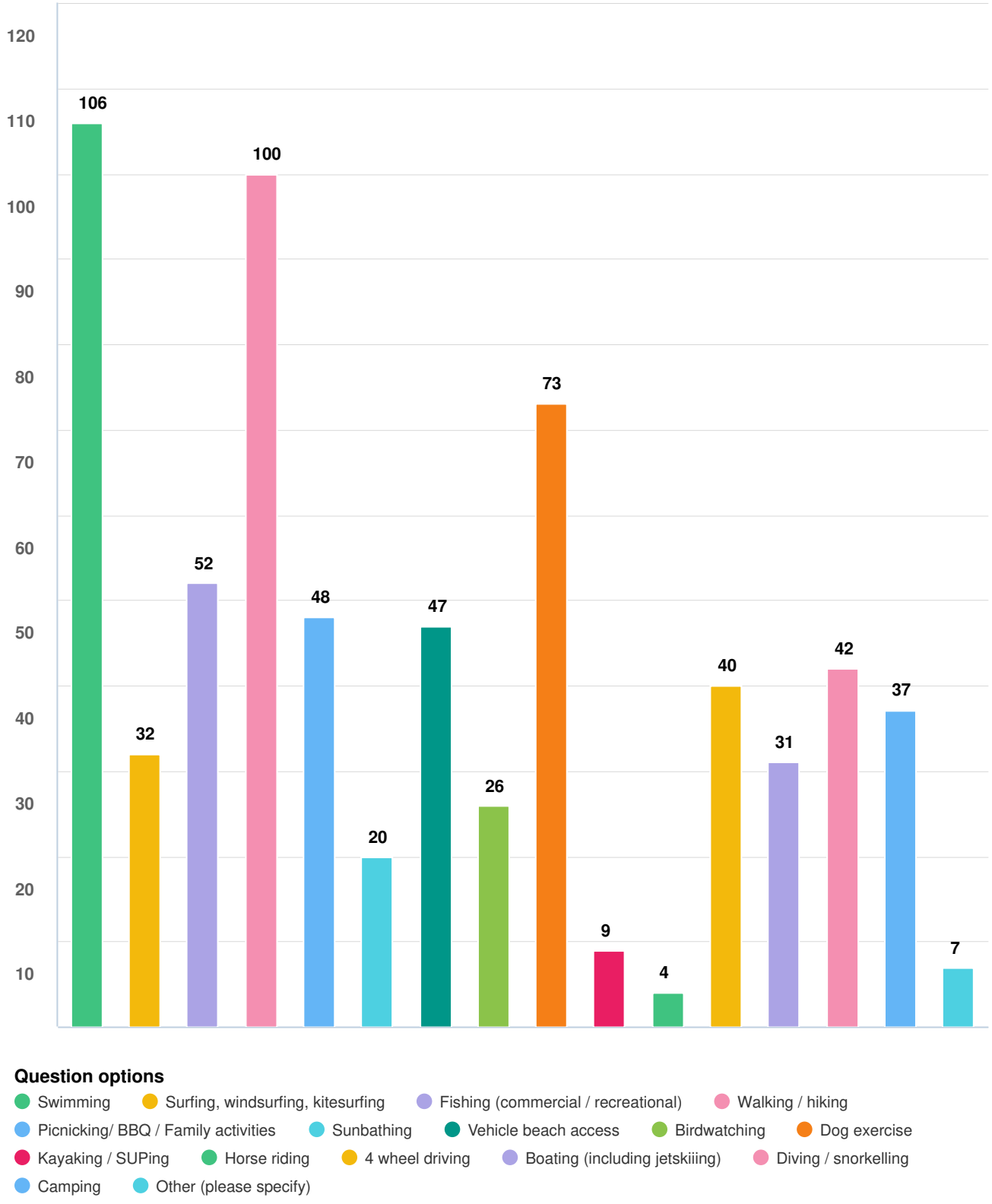


Question options

Less than an hour | 1-3 hours | Half a day | Full day | Overnight

Mandatory Question (140 response(s))
Question type: Radio Button Question

Q12 What are your main activities at your preferred beach(es)? (select all applicable)



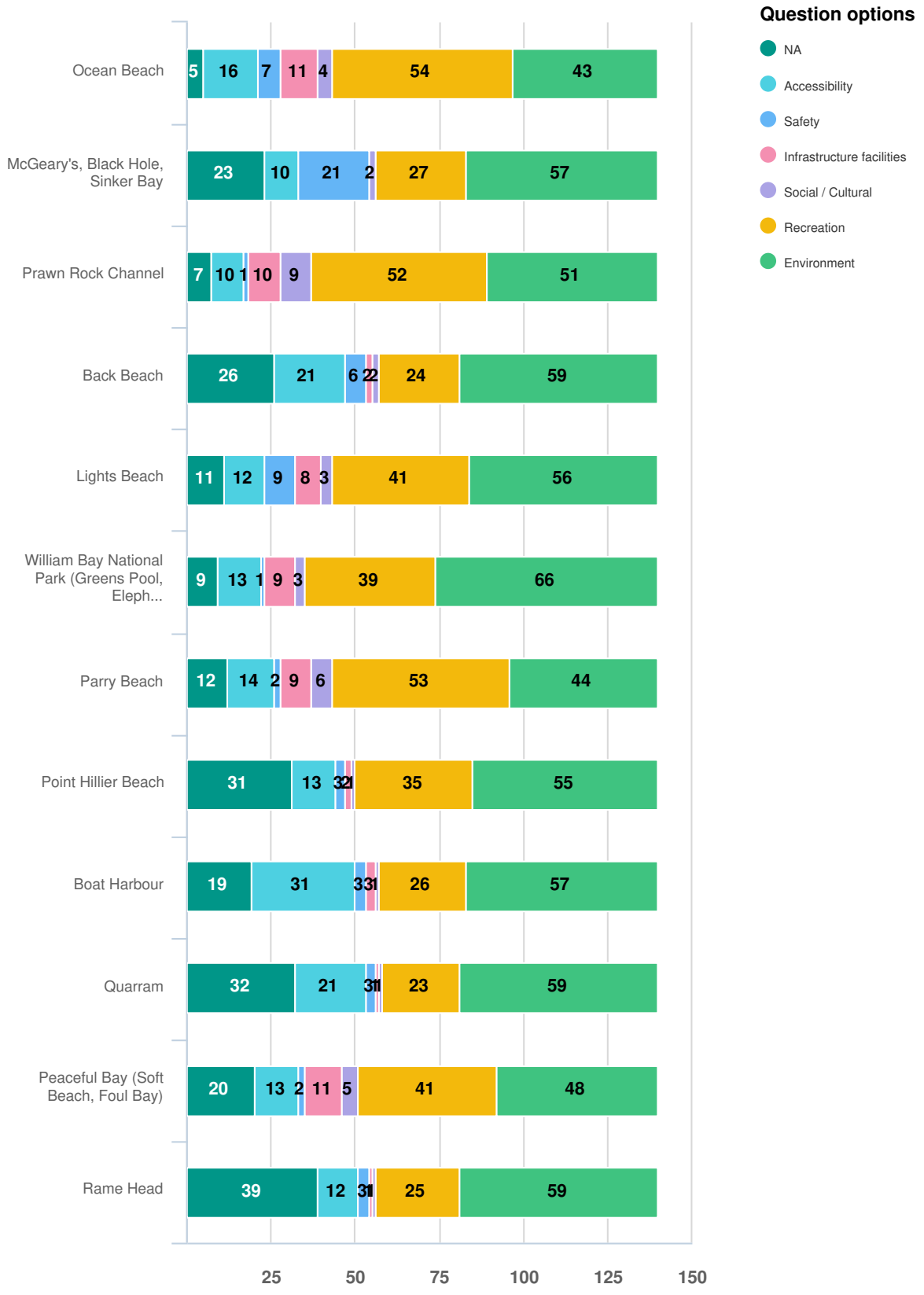
Mandatory Question (140 response(s))
Question type: Checkbox Question

Q13 **What values are most important to you in coastal management decision-making? Please rate the following values in level of importance (1 = highest importance; 6 = lowest importance)**

OPTIONS	AVG. RANK
Environmental	2.26
Recreational	2.53
Accessibility	3.69
Social / Cultural	3.99
Safety	4.04
Infrastructure amenities / Facilities	4.50

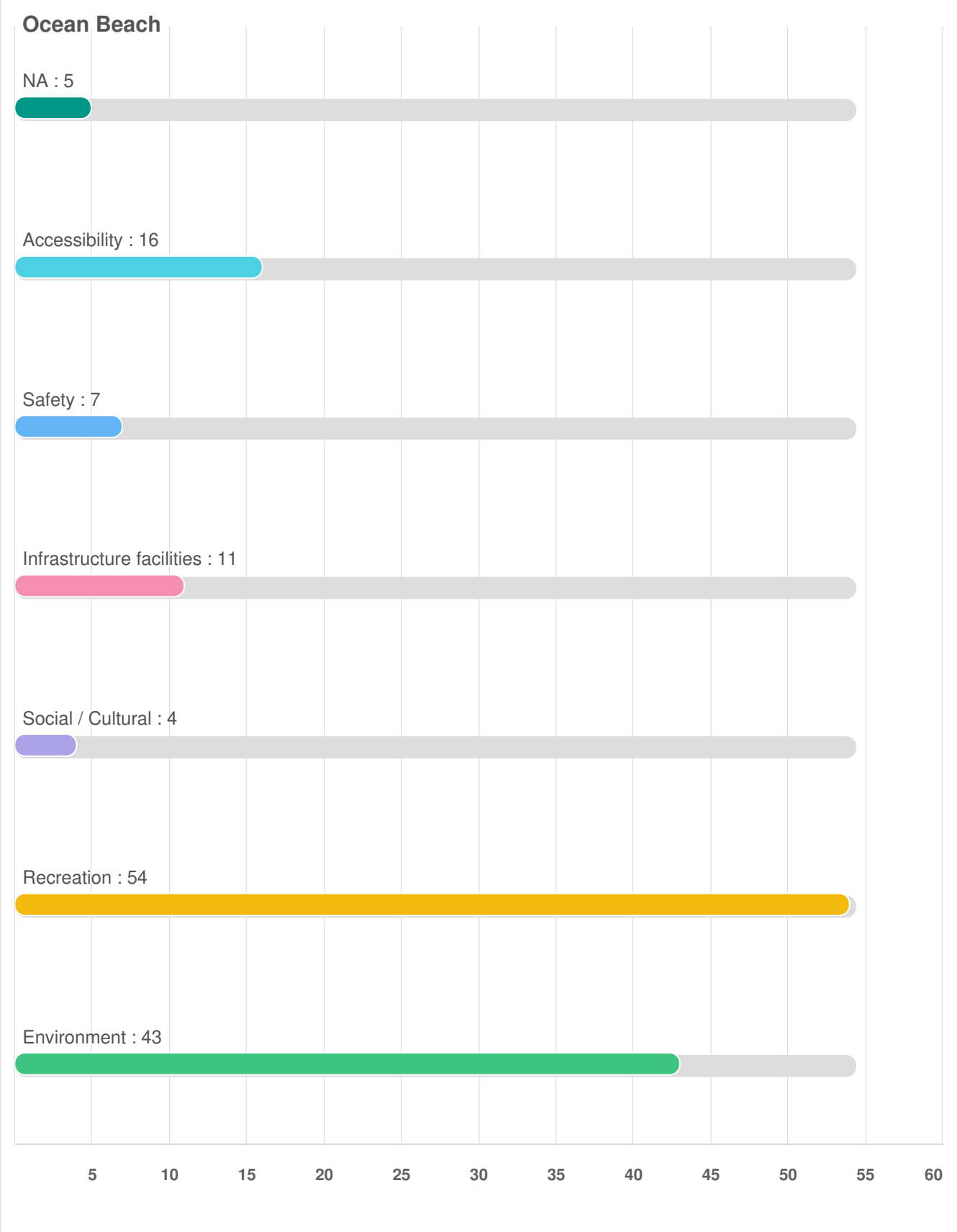
Mandatory Question (140 response(s))
Question type: Ranking Question

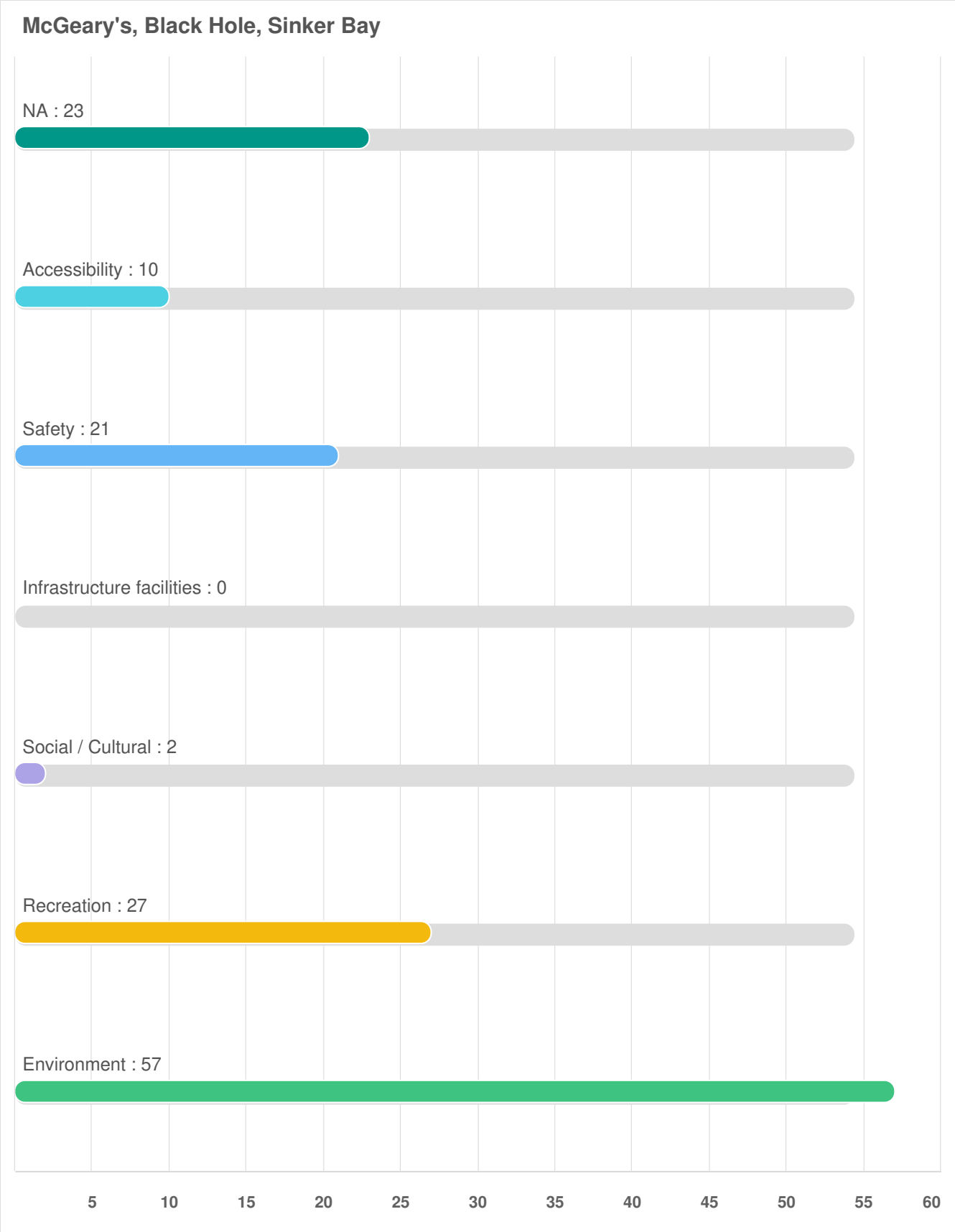
Q14 What values are most important to you at each of the following beaches?



Mandatory Question (140 response(s))
Question type: Likert Question

Q14 What values are most important to you at each of the following beaches?




McGeary's, Black Hole, Sinker Bay
NA : 23
Accessibility : 10
Safety : 21
Infrastructure facilities : 0
Social / Cultural : 2
Recreation : 27
Environment : 57
5
10
15
20
25
30
35
40
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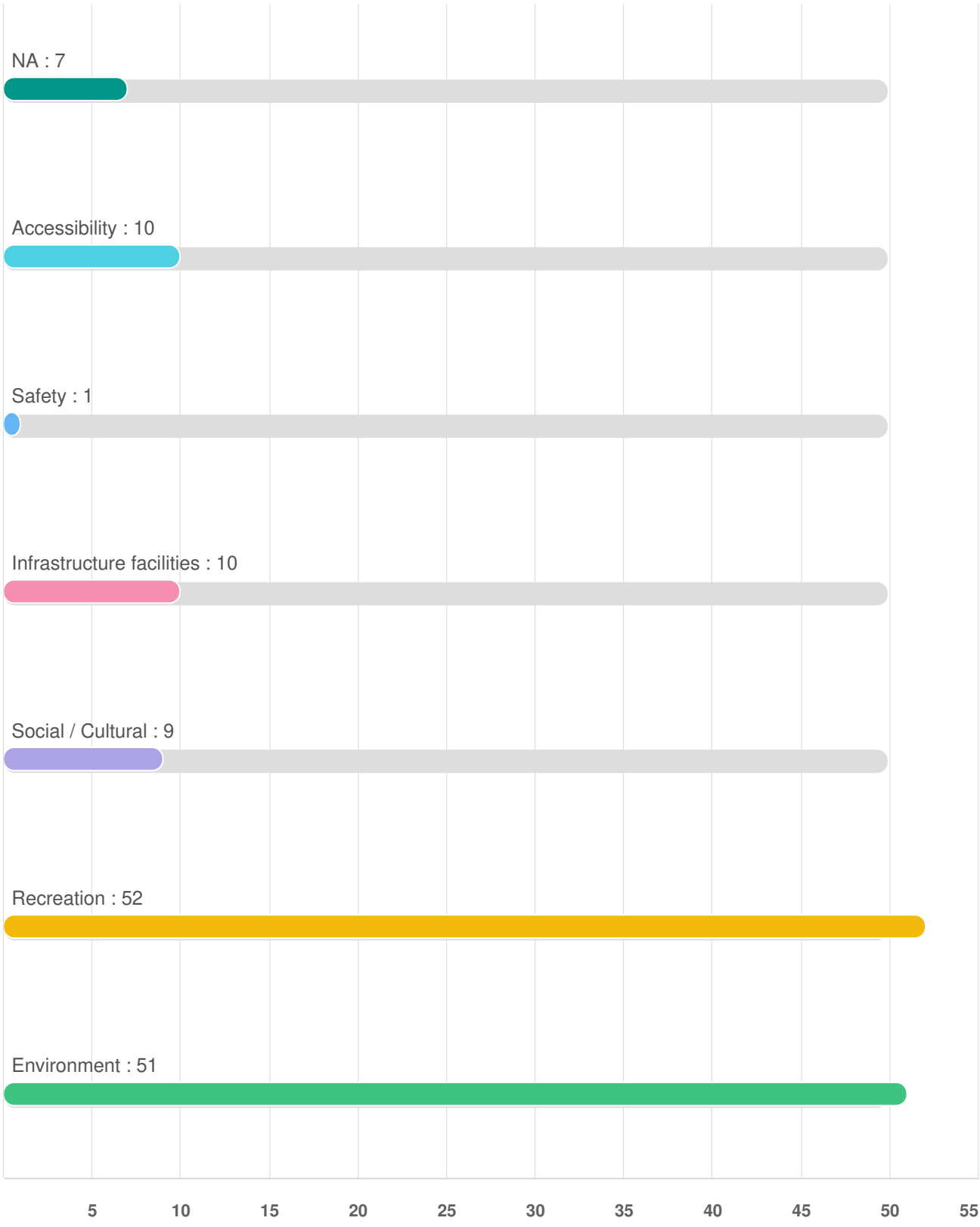
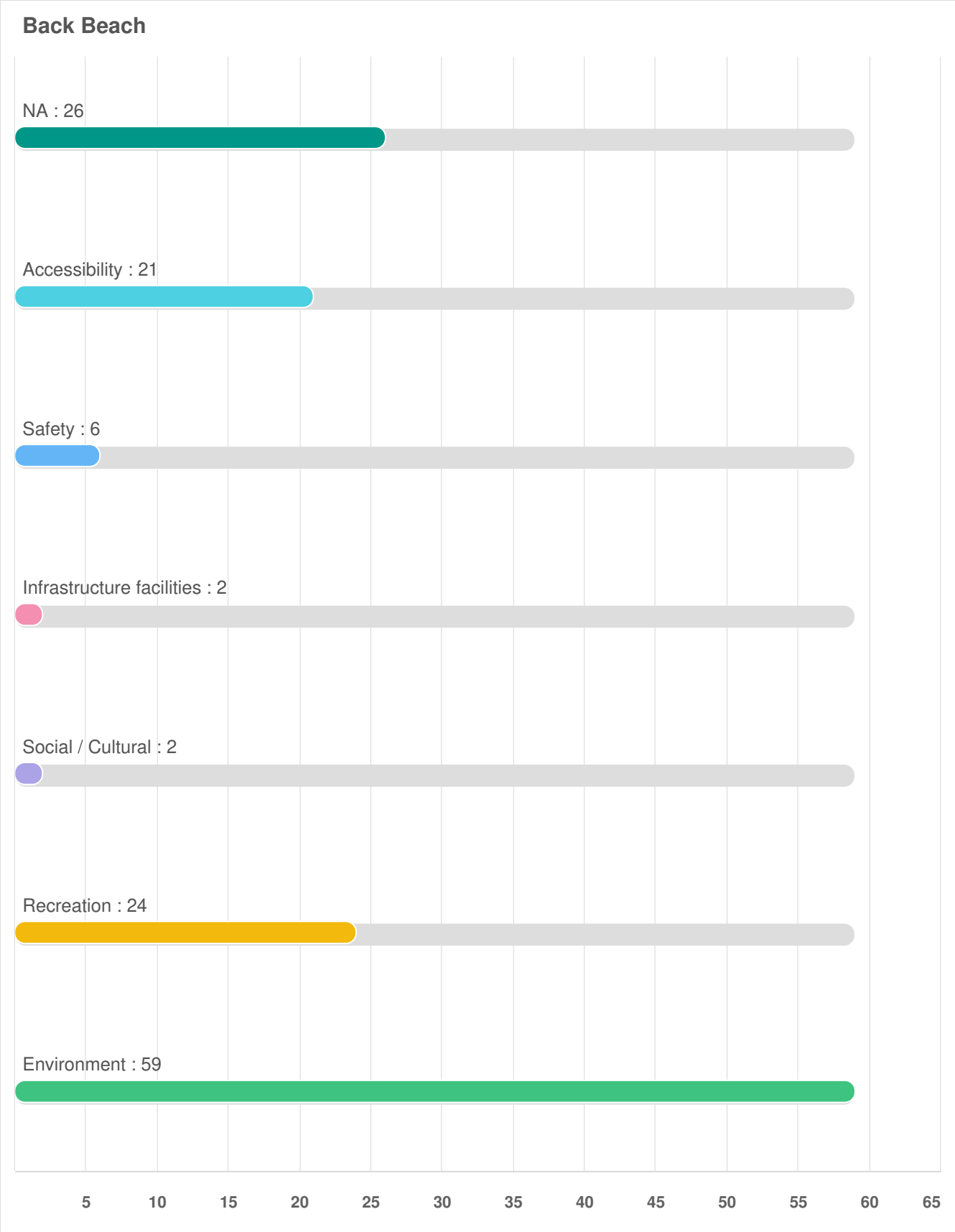
55
60

Prawn Rock Channel




Back Beach
NA : 26
Accessibility : 21
Safety : 6
Infrastructure facilities : 2
Social / Cultural : 2
Recreation : 24
Environment : 59
5
10
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60
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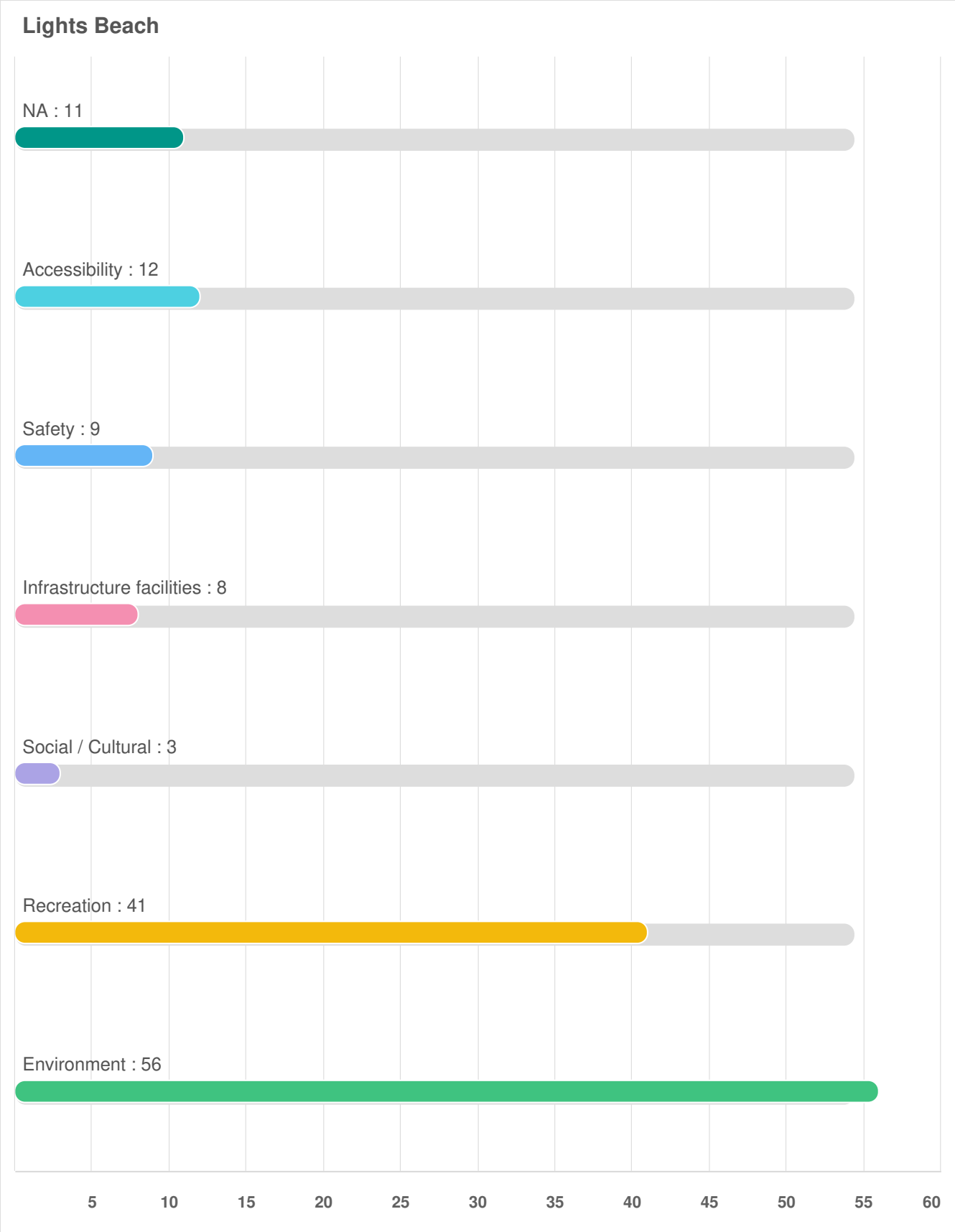
Lights Beach
NA : 11
Accessibility : 12
Safety : 9
Infrastructure facilities : 8
Social / Cultural : 3
Recreation : 41
Environment : 56
5
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25
30
35
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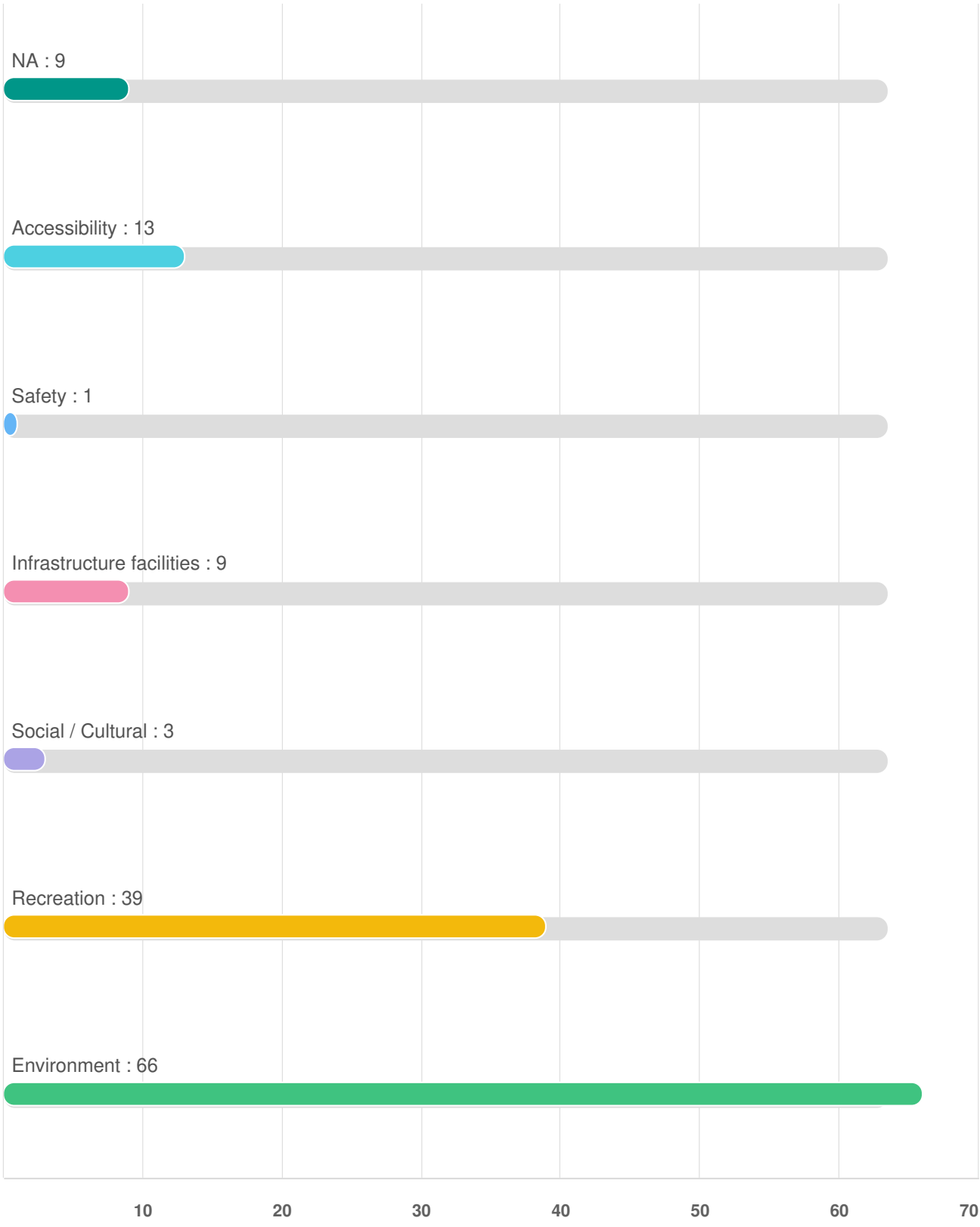
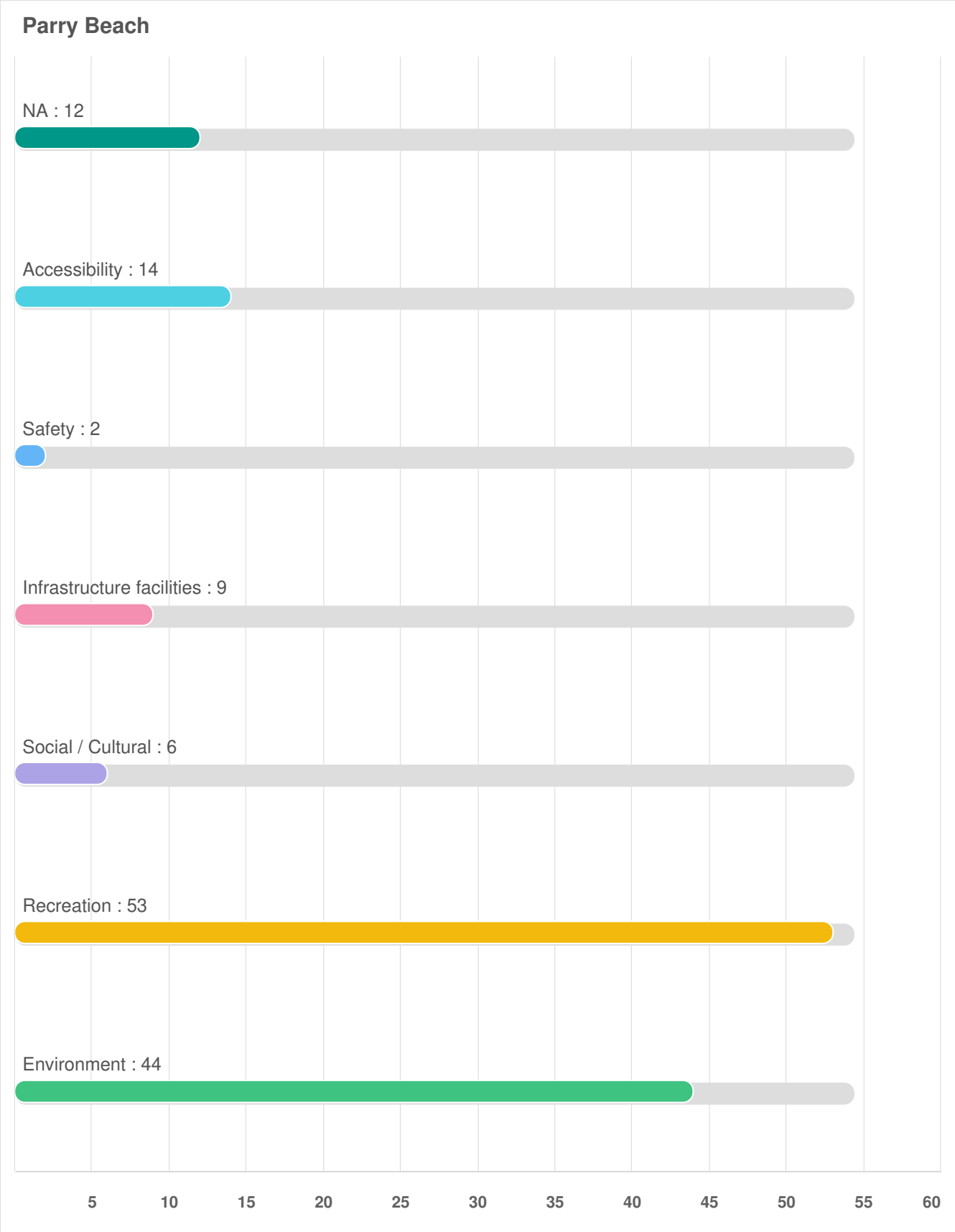
55
60

William Bay National Park (Greens Pool, Elephant Rocks, Madfish, Waterfall Beach)




Parry Beach
NA : 12
Accessibility : 14
Safety : 2
Infrastructure facilities : 9
Social / Cultural : 6
Recreation : 53
Environment : 44
5
10
15
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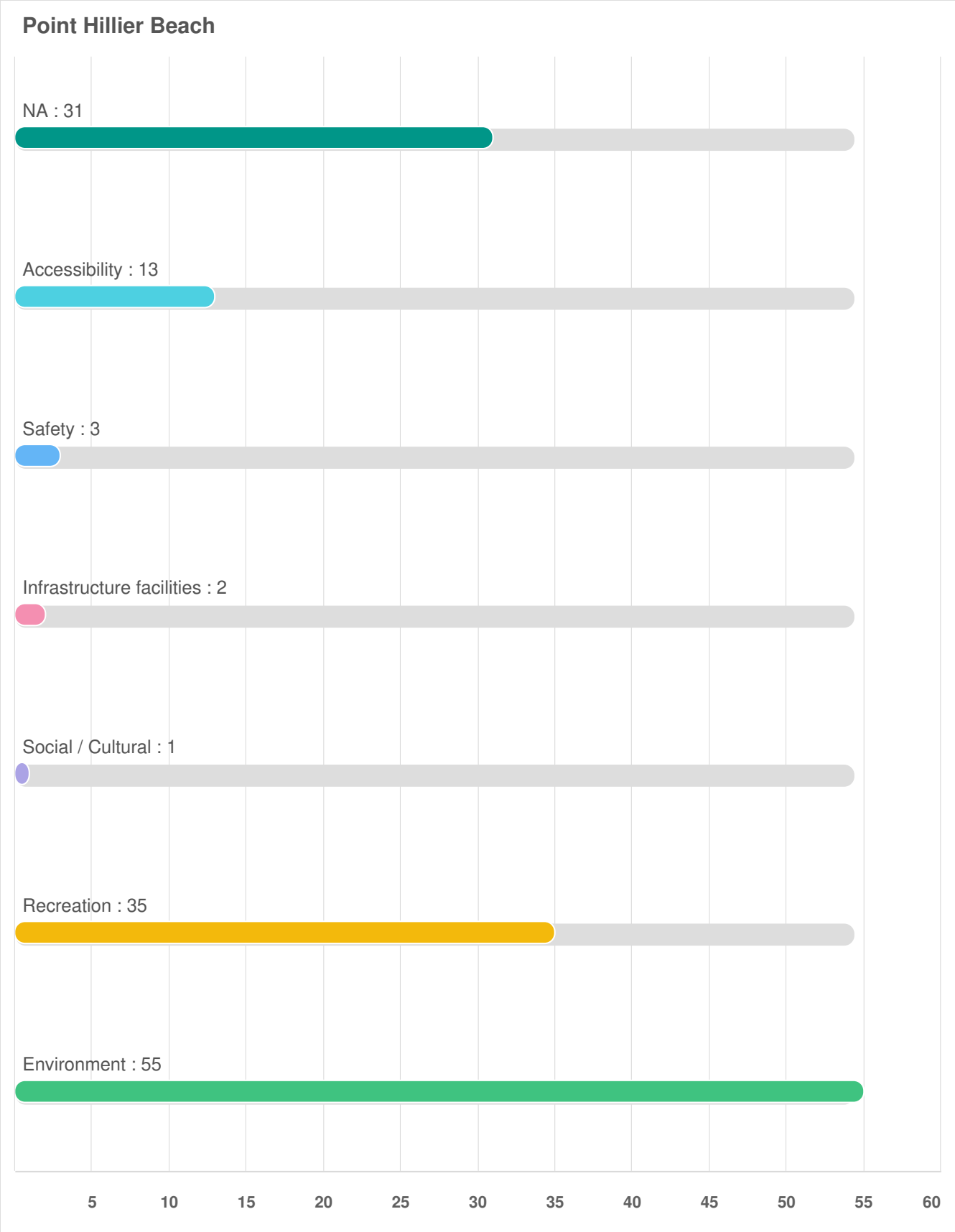
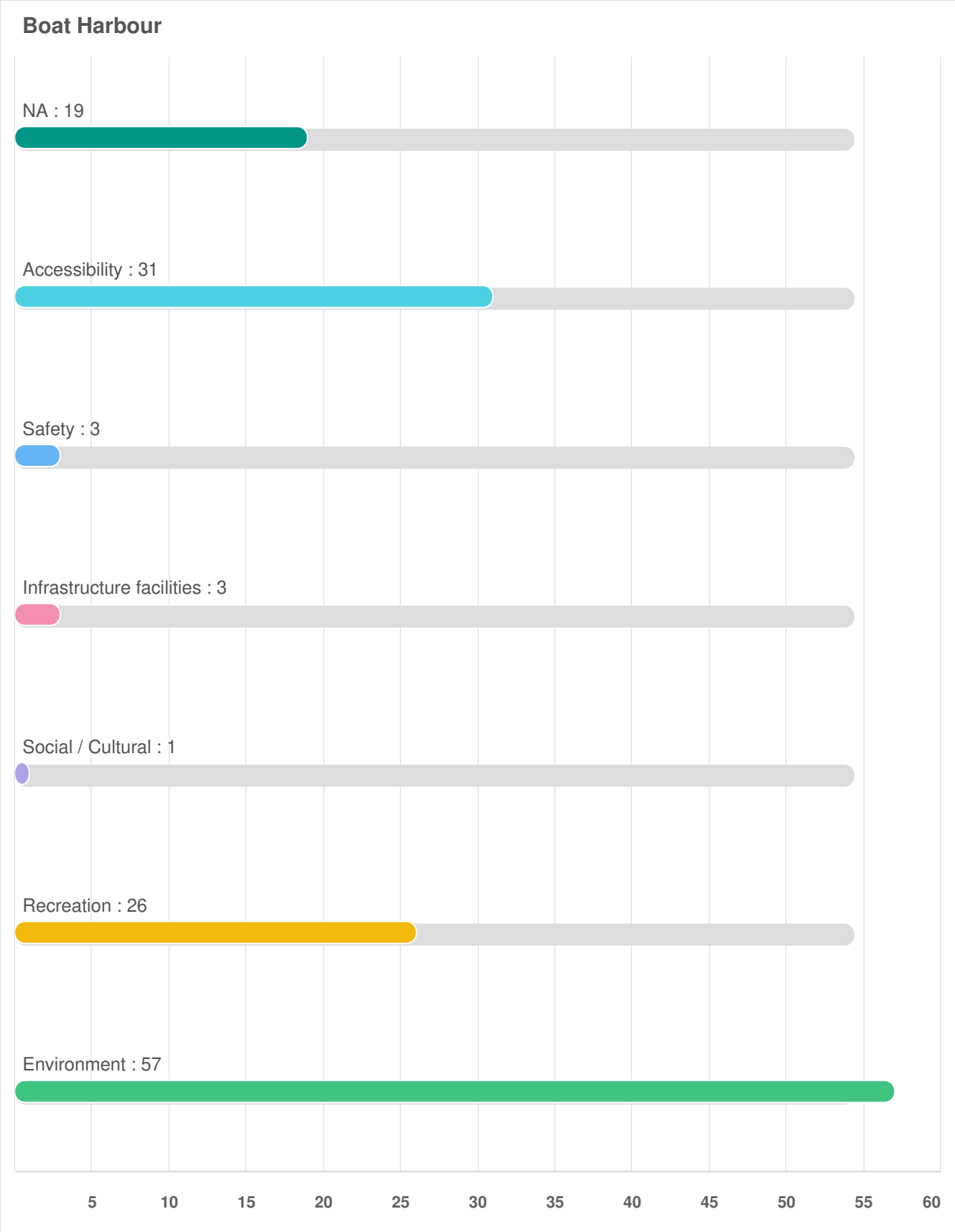
25
30
35
40
45
50
55
60


Point Hillier Beach
NA : 31
Accessibility : 13
Safety : 3
Infrastructure facilities : 2
Social / Cultural : 1
Recreation : 35
Environment : 55
5
10
15
20
25
30
35
40
45
50
55
60


Boat Harbour
NA : 19
Accessibility : 31
Safety : 3
Infrastructure facilities : 3
Social / Cultural : 1
Recreation : 26
Environment : 57
5
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15
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25
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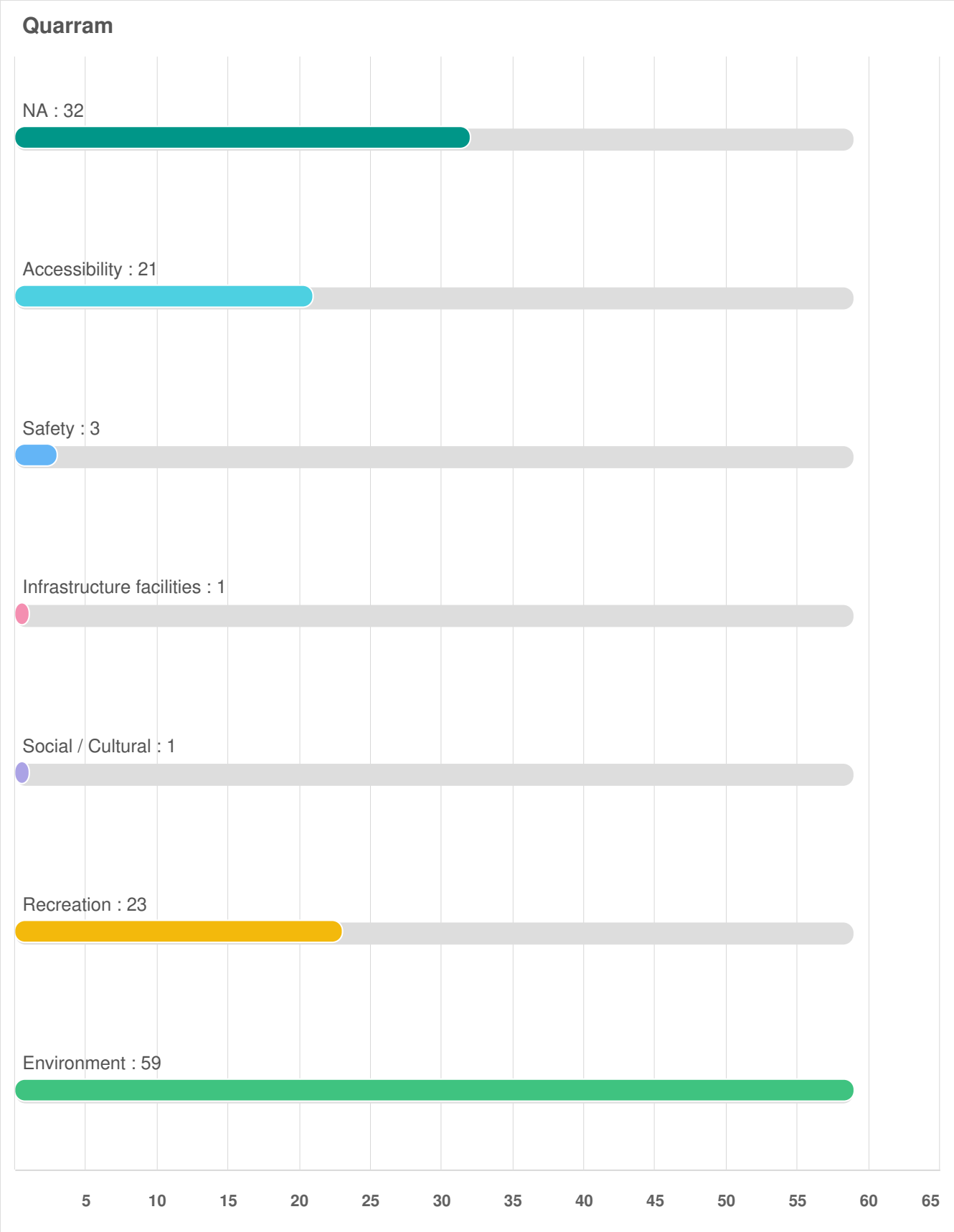
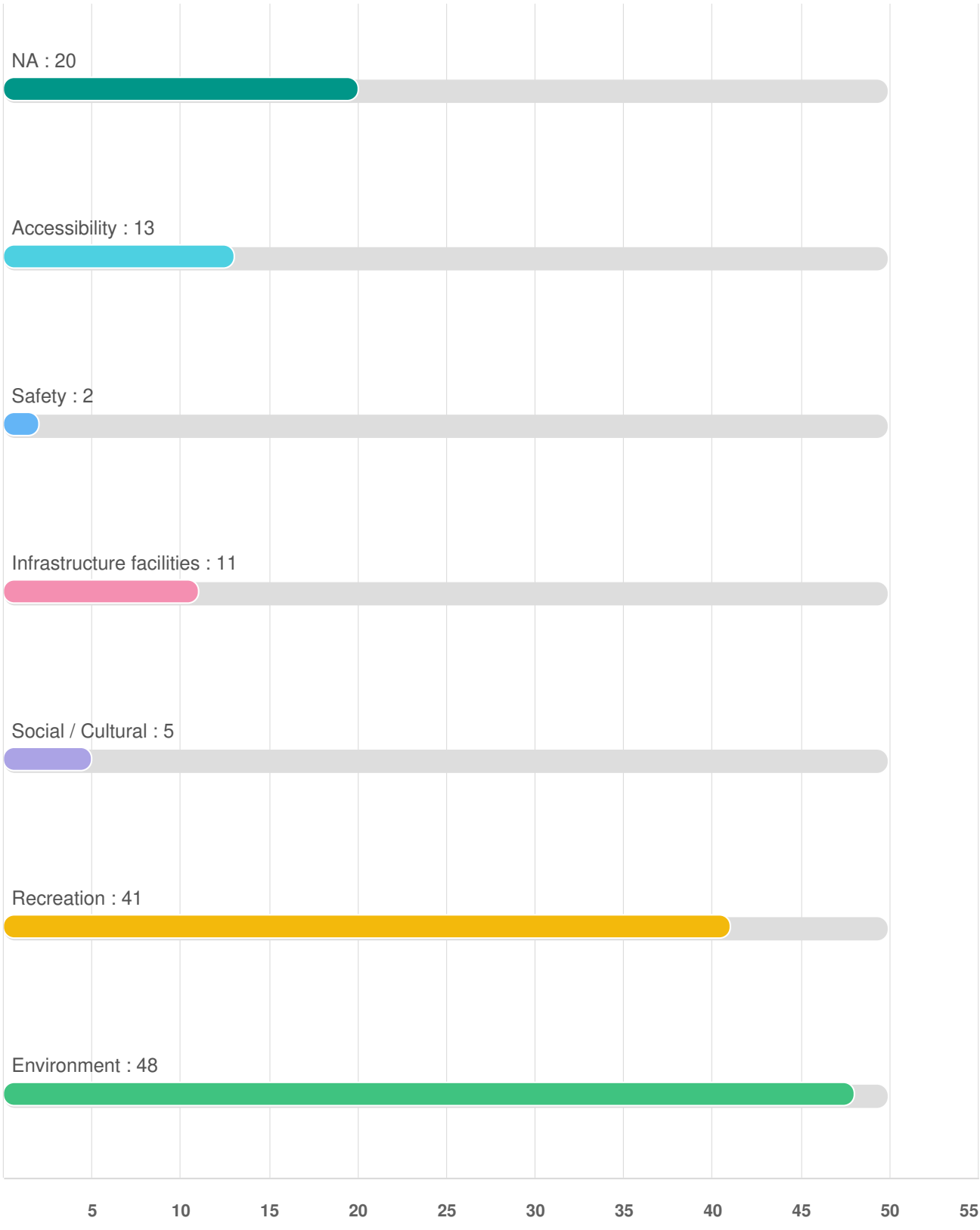
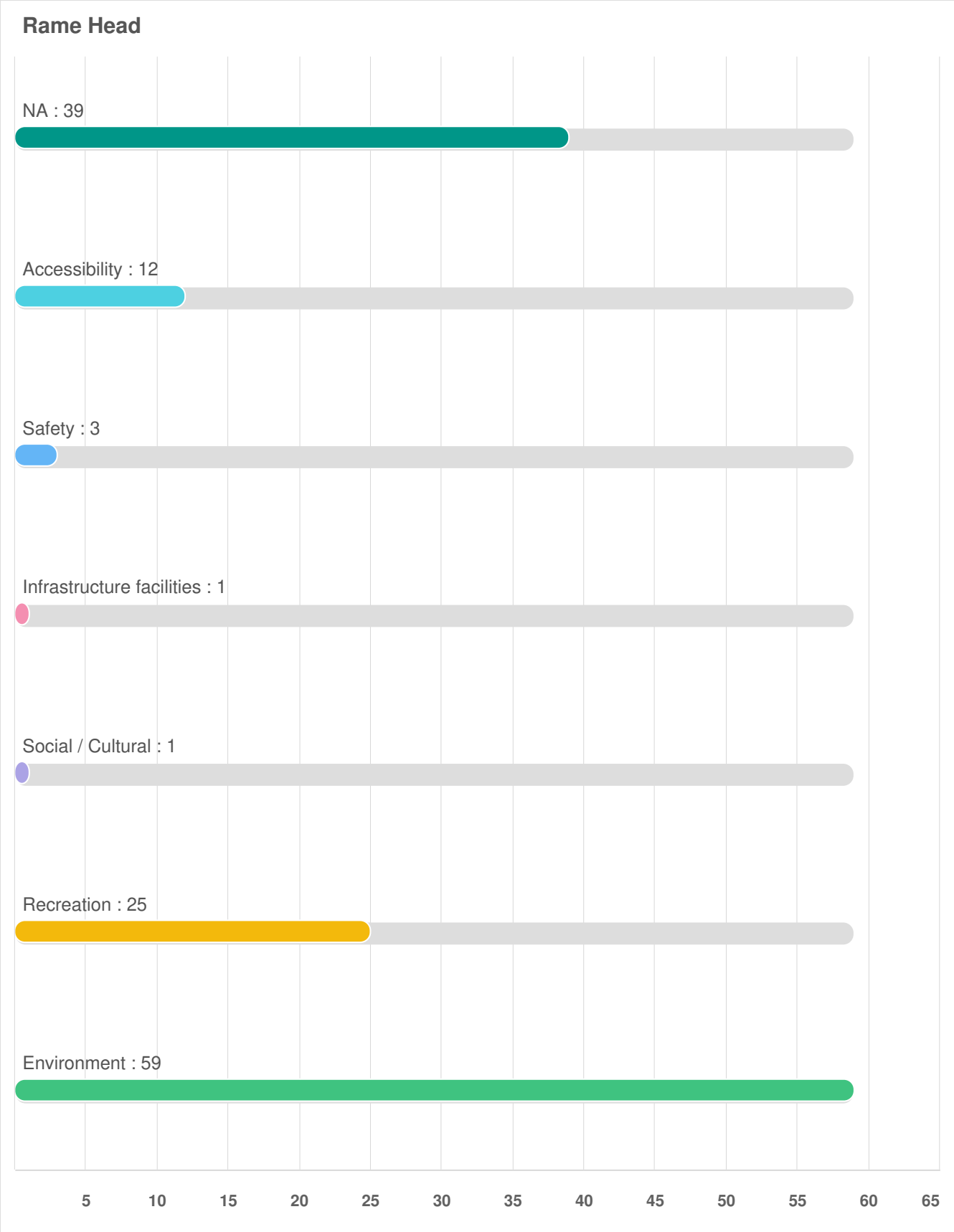
35
40
45
50
55
60


Quarram
NA : 32
Accessibility : 21
Safety : 3
Infrastructure facilities : 1
Social / Cultural : 1
Recreation : 23
Environment : 59
5
10
15
20
25
30
35
40
45
50
55
60
65

Peaceful Bay (Soft Beach, Foul Bay)




Rame Head
NA : 39
Accessibility : 12
Safety : 3
Infrastructure facilities : 1
Social / Cultural : 1
Recreation : 25
Environment : 59
5
10
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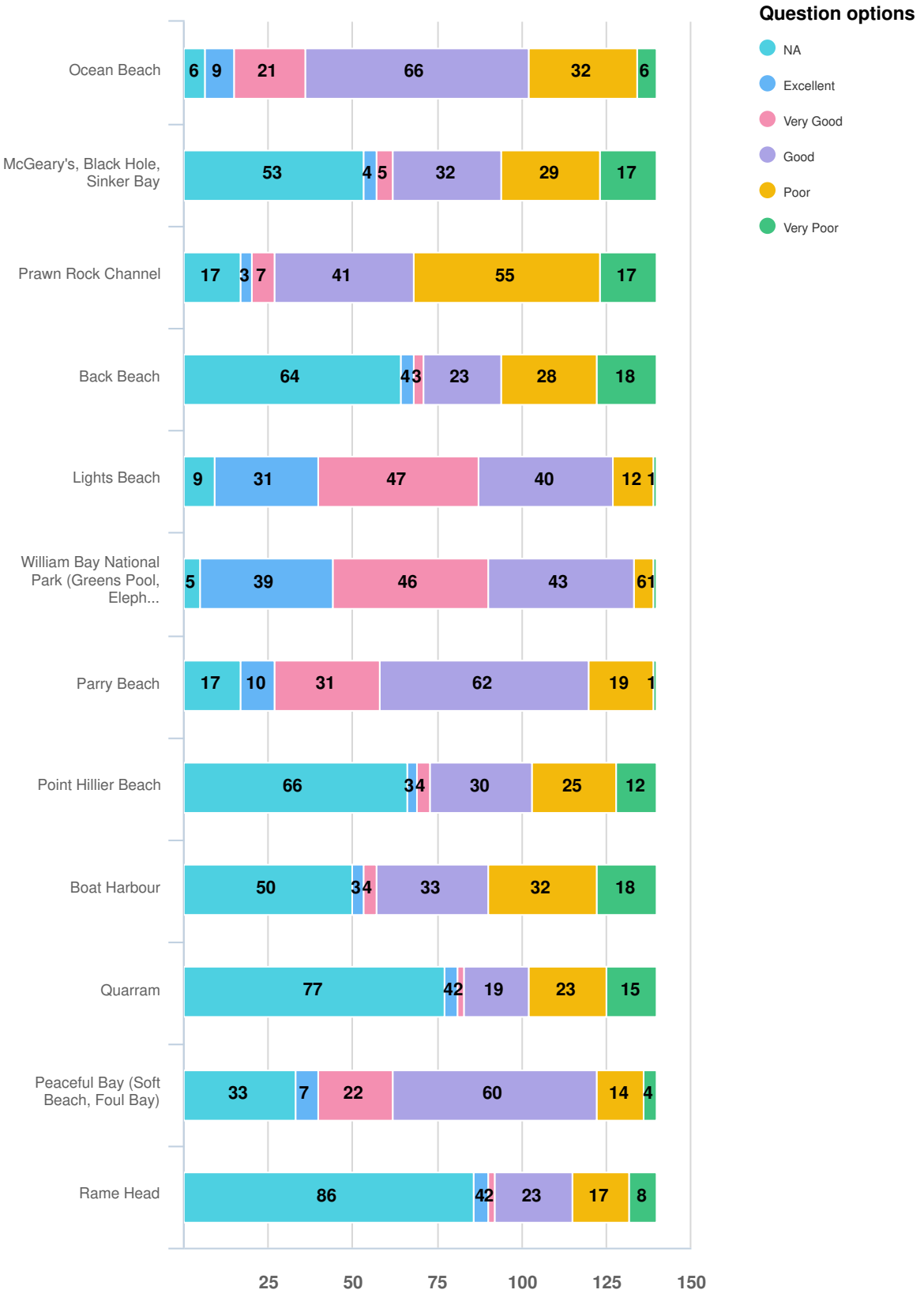
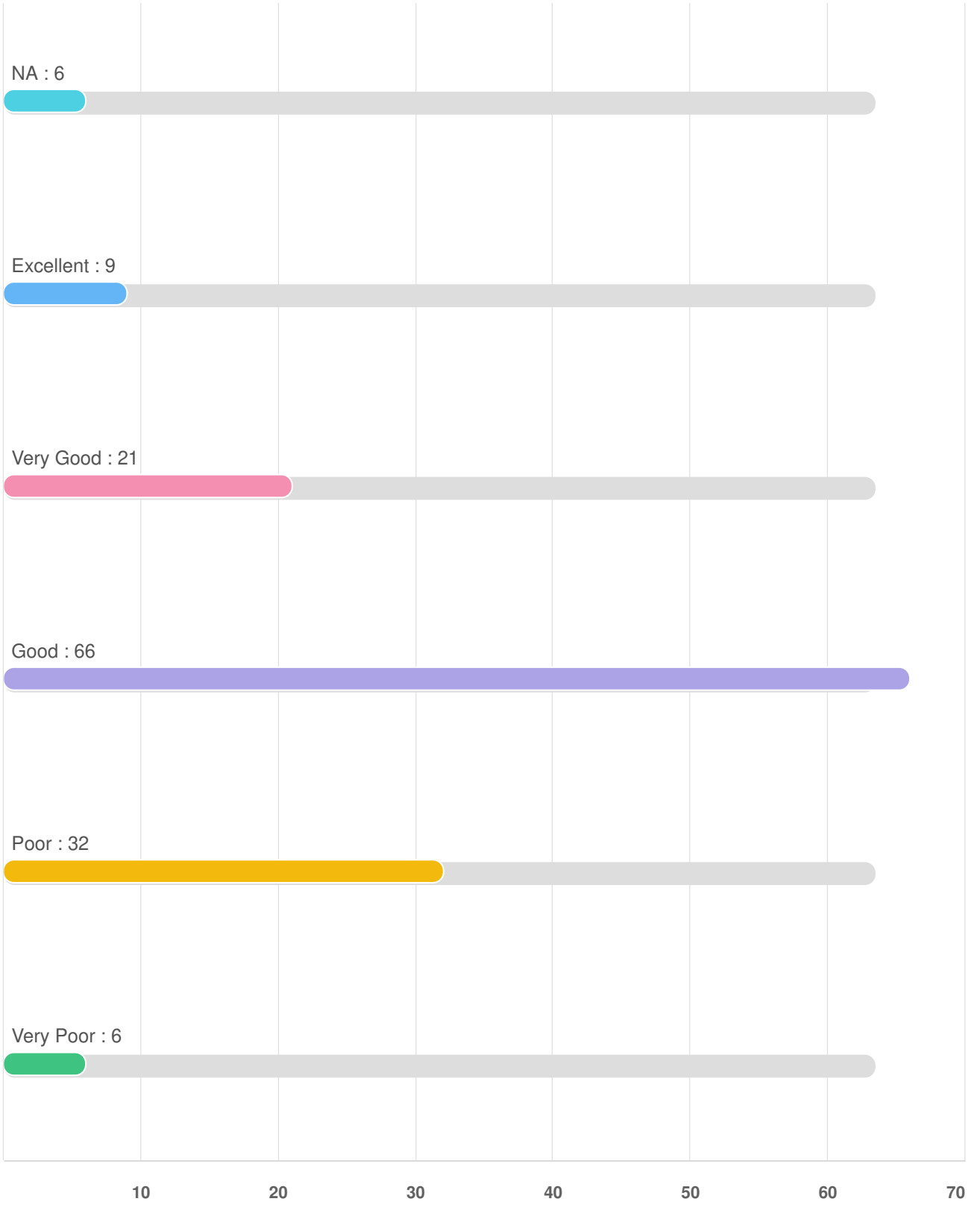
Q15 How would you rate the infrastructure facilities (eg. toilets, carpark, rubbish bins) at the following beaches?

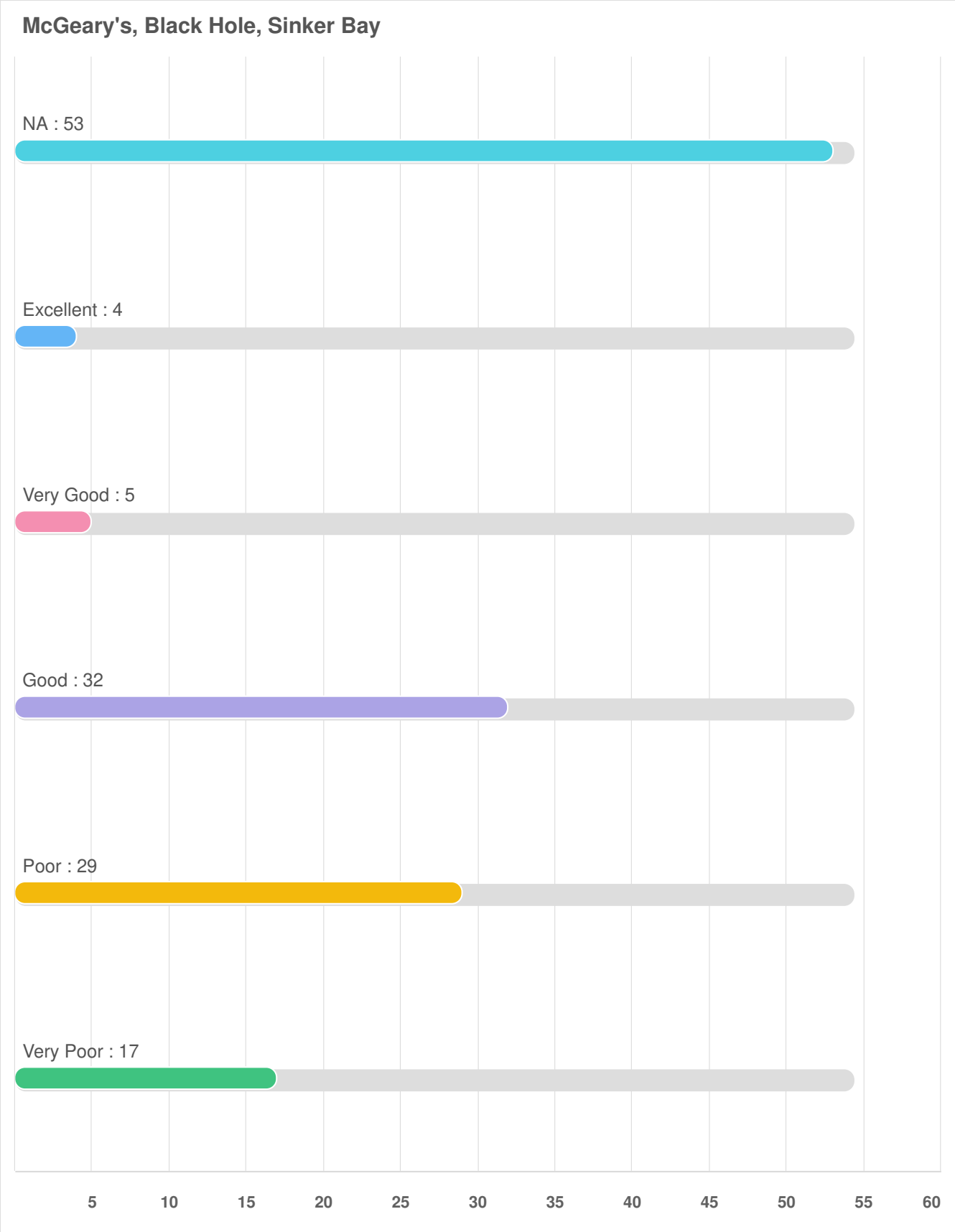


Mandatory Question (140 response(s))
Question type: Likert Question

Q15 | **How would you rate the infrastructure facilities (eg. toilets, carpark, rubbish bins) at the following beaches?**

Ocean Beach




McGeary's, Black Hole, Sinker Bay
NA : 53
Excellent : 4
Very Good : 5
Good : 32
Poor : 29
Very Poor : 17
5
10
15
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25
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35
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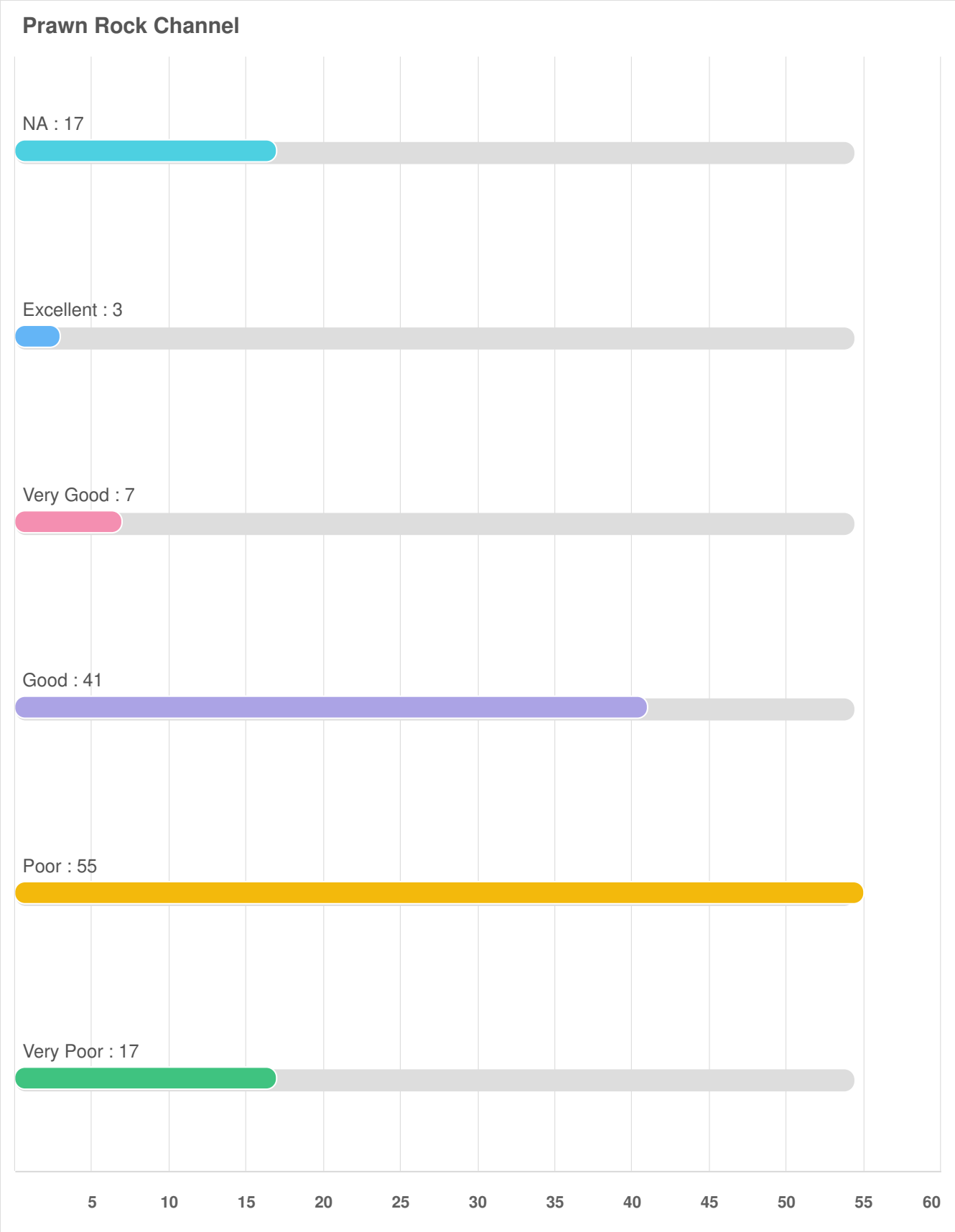
45
50
55
60


Prawn Rock Channel
NA : 17
Excellent : 3
Very Good : 7
Good : 41
Poor : 55
Very Poor : 17
5
10
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45
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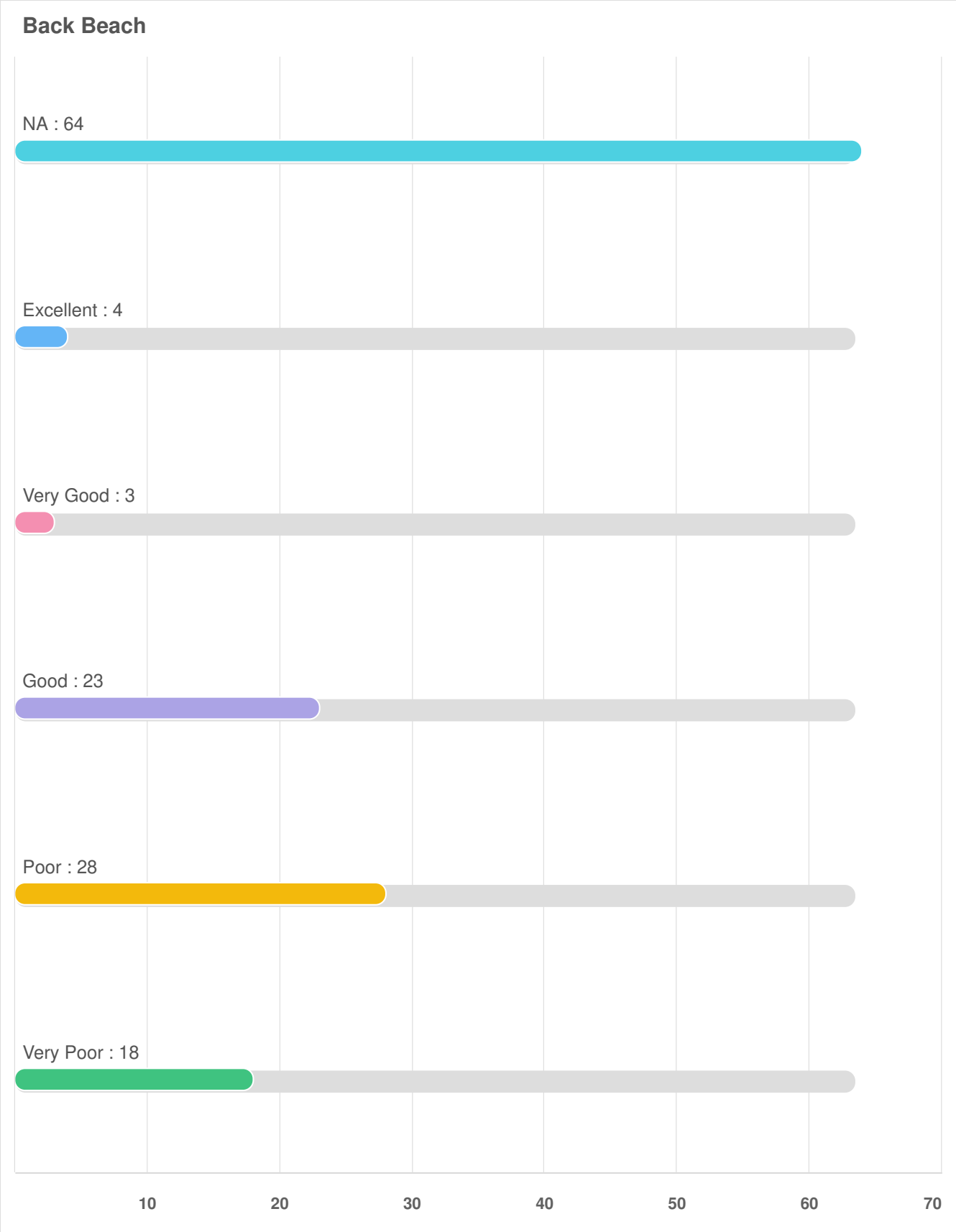
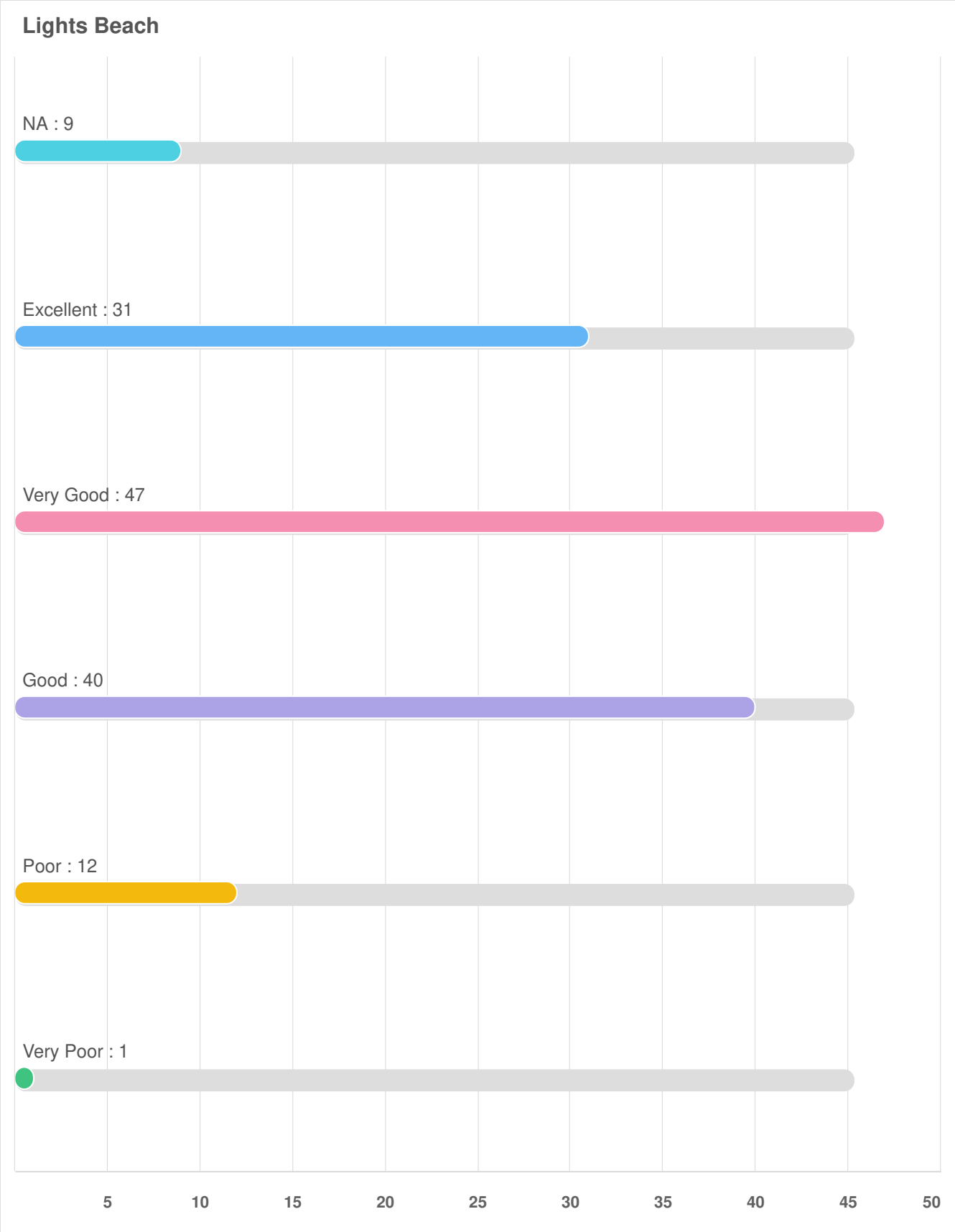
55
60


Back Beach
NA : 64
Excellent : 4
Very Good : 3
Good : 23
Poor : 28
Very Poor : 18
10
20
30
40
50
60
70


Lights Beach
NA : 9
Excellent : 31
Very Good : 47
Good : 40
Poor : 12
Very Poor : 1
5
10
15
20
25
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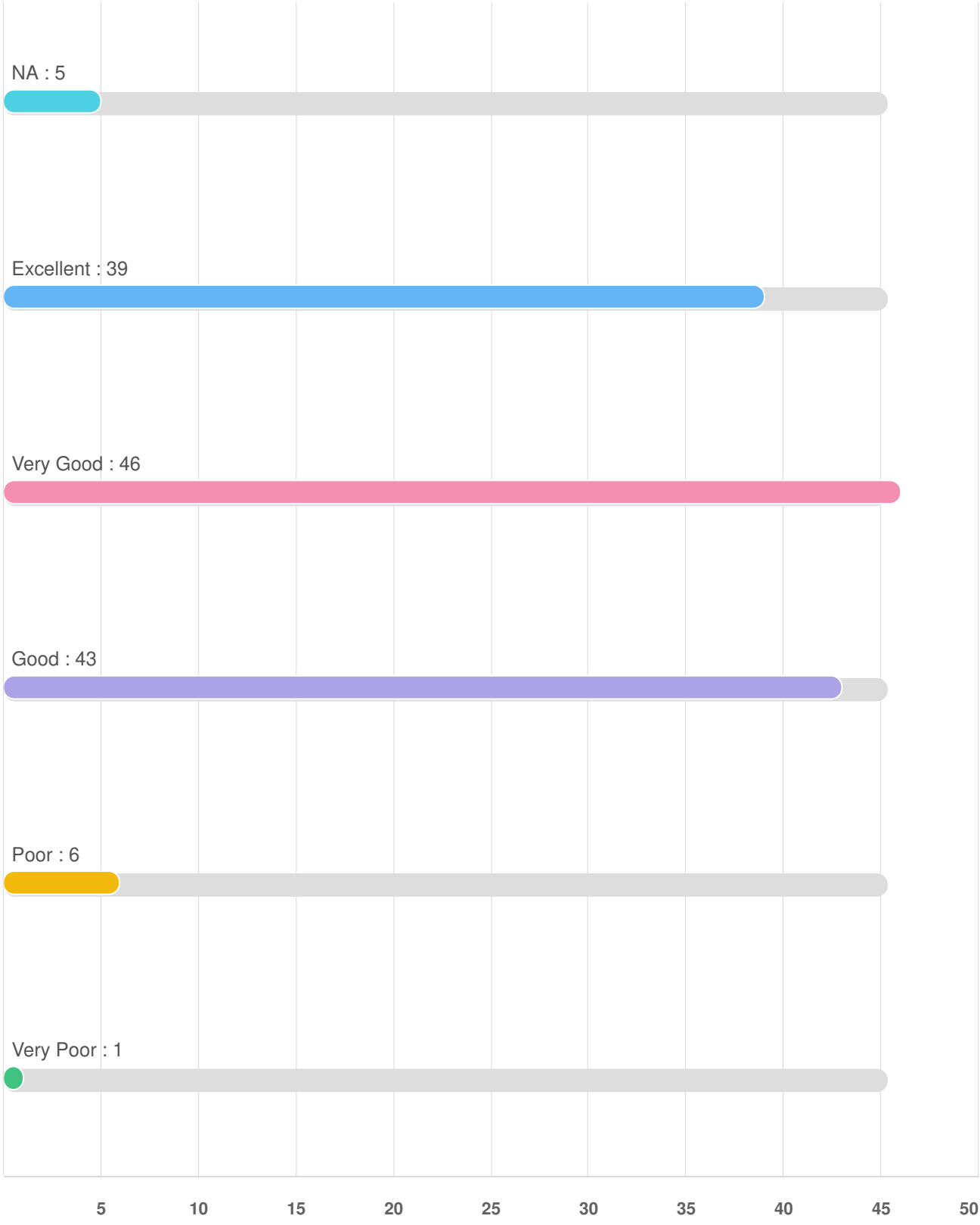
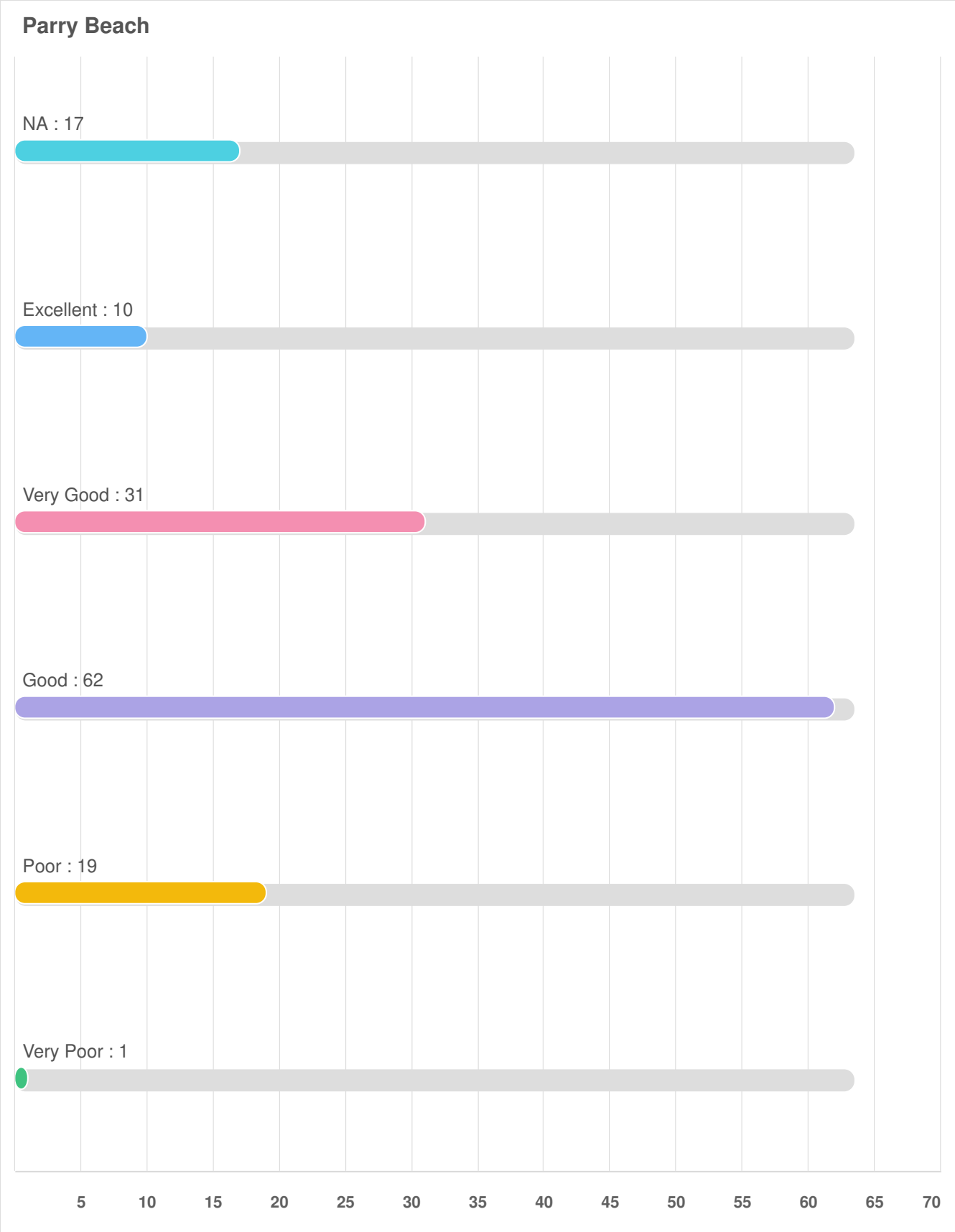
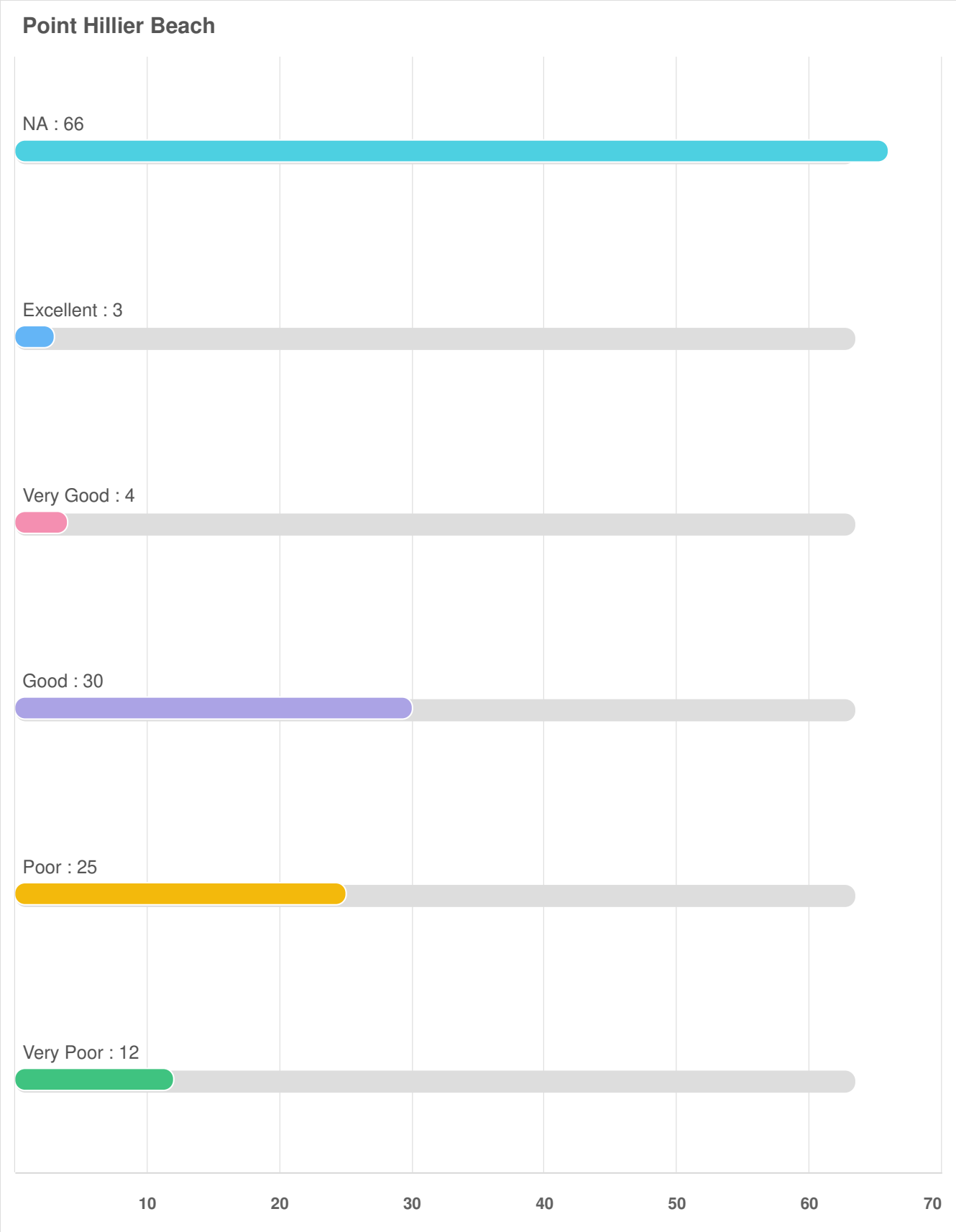
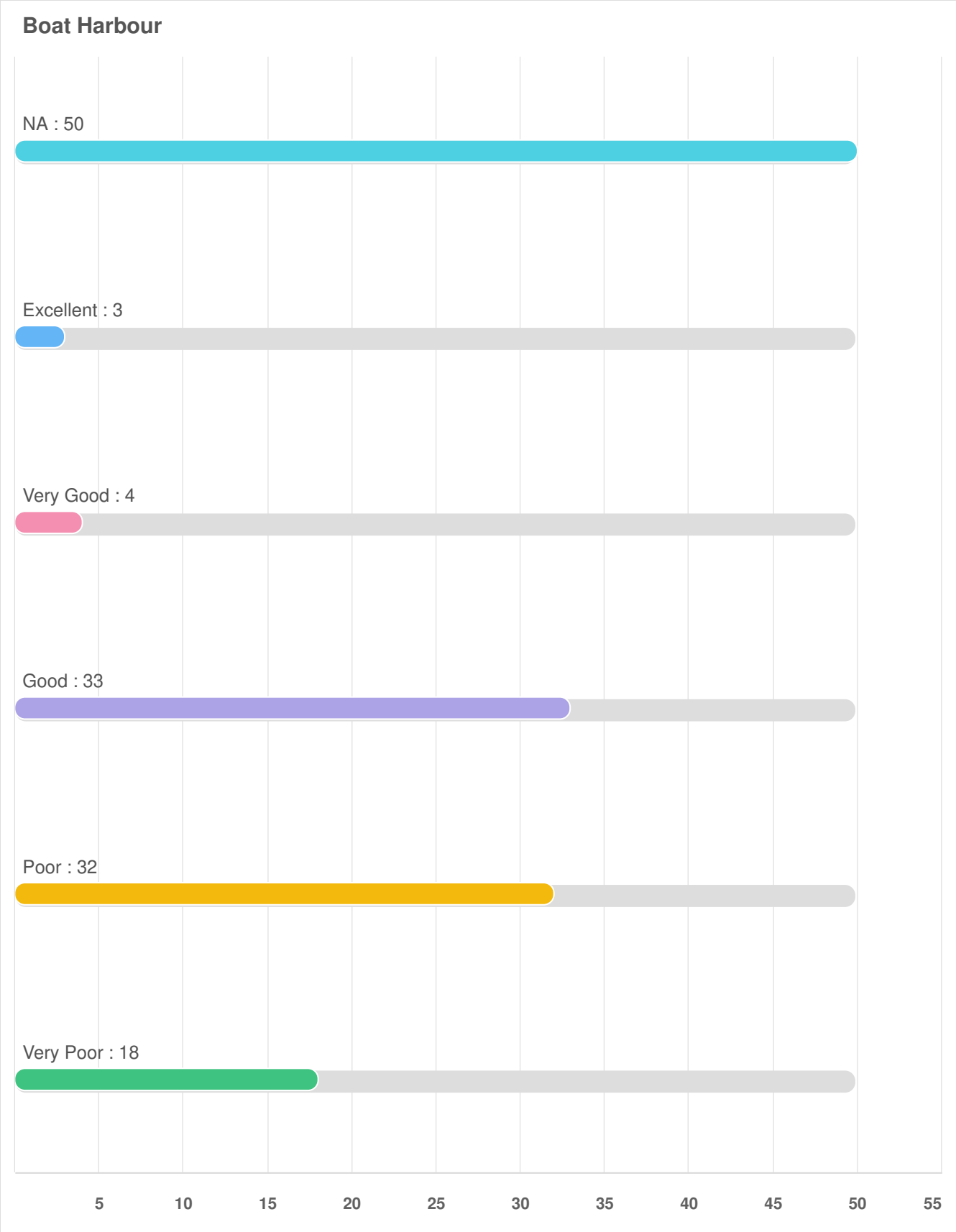
35
40
45
50

William Bay National Park (Greens Pool, Elephant Rocks, Madfish, Waterfall Beach)




Parry Beach
NA : 17
Excellent : 10
Very Good : 31
Good : 62
Poor : 19
Very Poor : 1
5
10
15
20
25
30
35
40
45
50
55
60
65
70


Point Hillier Beach
NA : 66
Excellent : 3
Very Good : 4
Good : 30
Poor : 25
Very Poor : 12
10
20
30
40
50
60
70


Boat Harbour
NA : 50
Excellent : 3
Very Good : 4
Good : 33
Poor : 32
Very Poor : 18
5
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25
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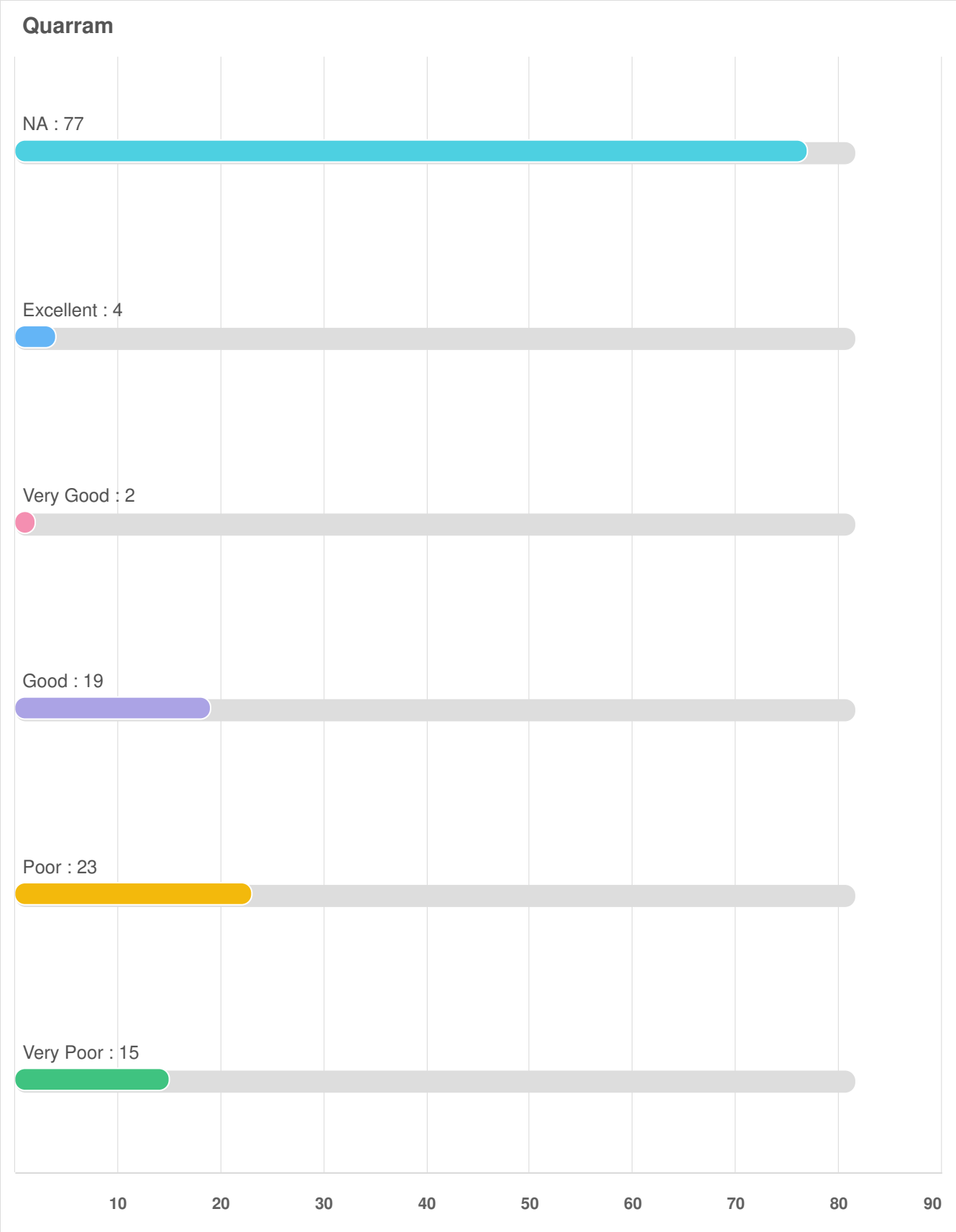
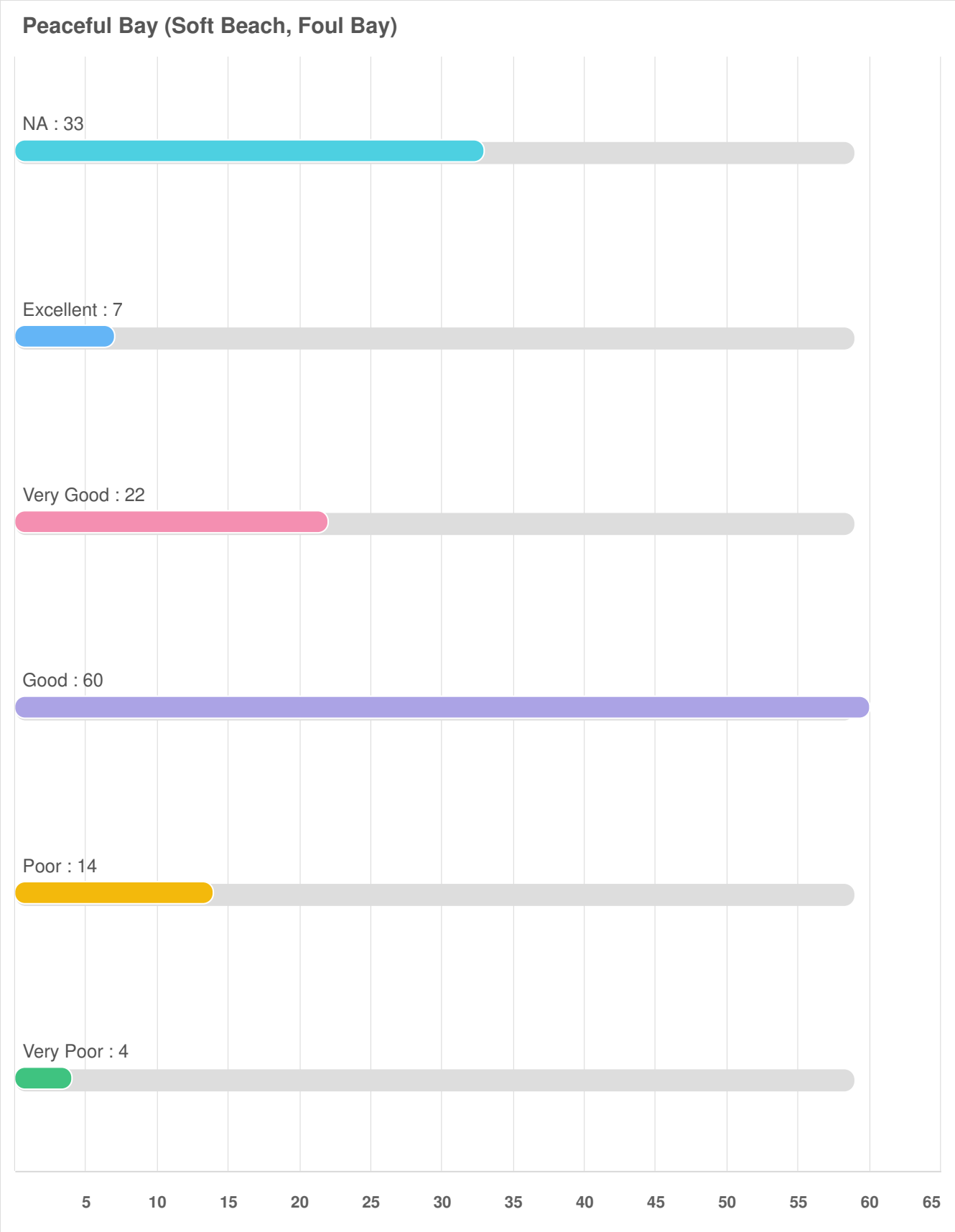
35
40
45
50
55


Quarram
NA : 77
Excellent : 4
Very Good : 2
Good : 19
Poor : 23
Very Poor : 15
10
20
30
40
50
60
70
80
90


Peaceful Bay (Soft Beach, Foul Bay)
NA : 33
Excellent : 7
Very Good : 22
Good : 60
Poor : 14
Very Poor : 4
5
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60
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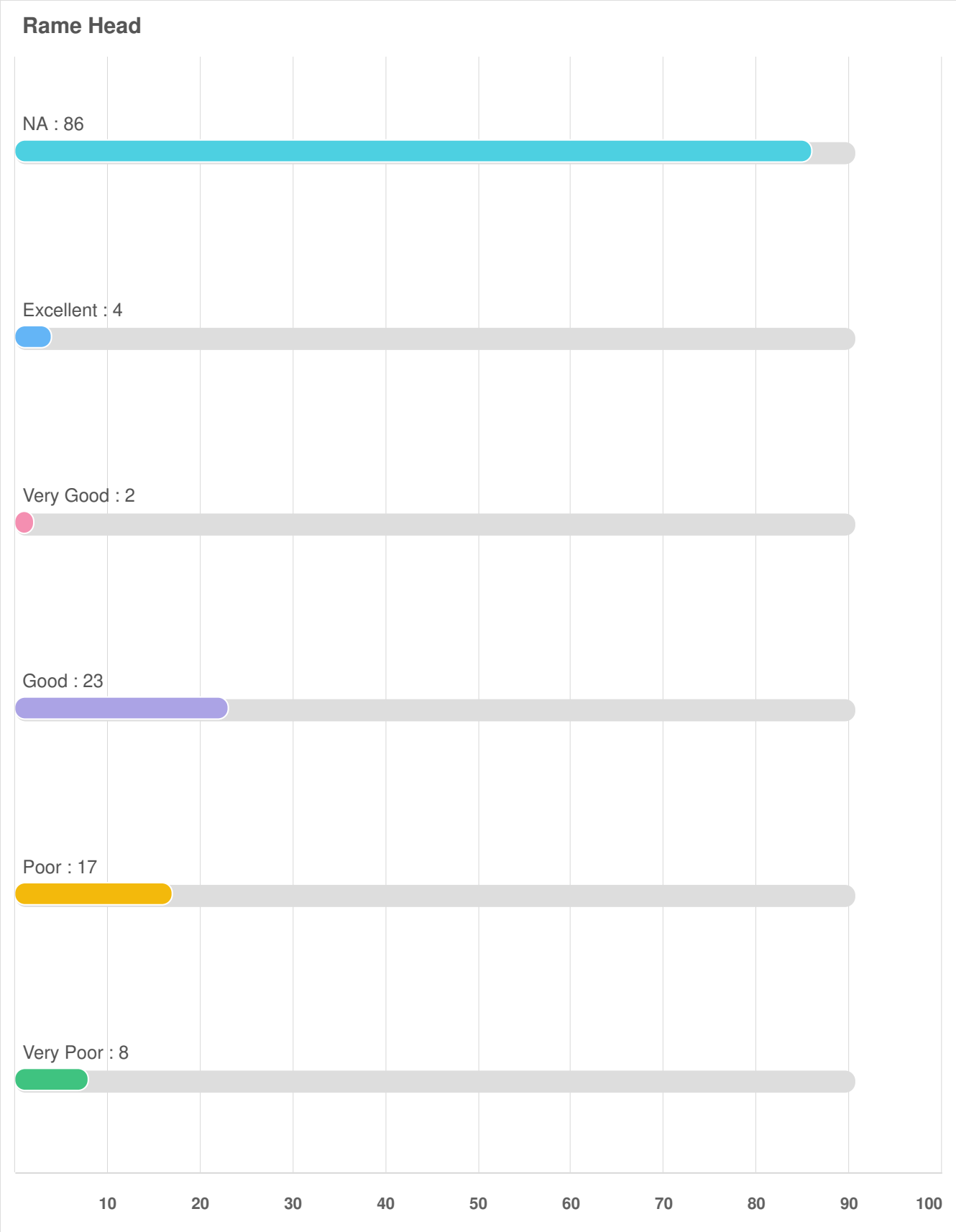
Rame Head
NA : 86
Excellent : 4
Very Good : 2
Good : 23
Poor : 17
Very Poor : 8
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60
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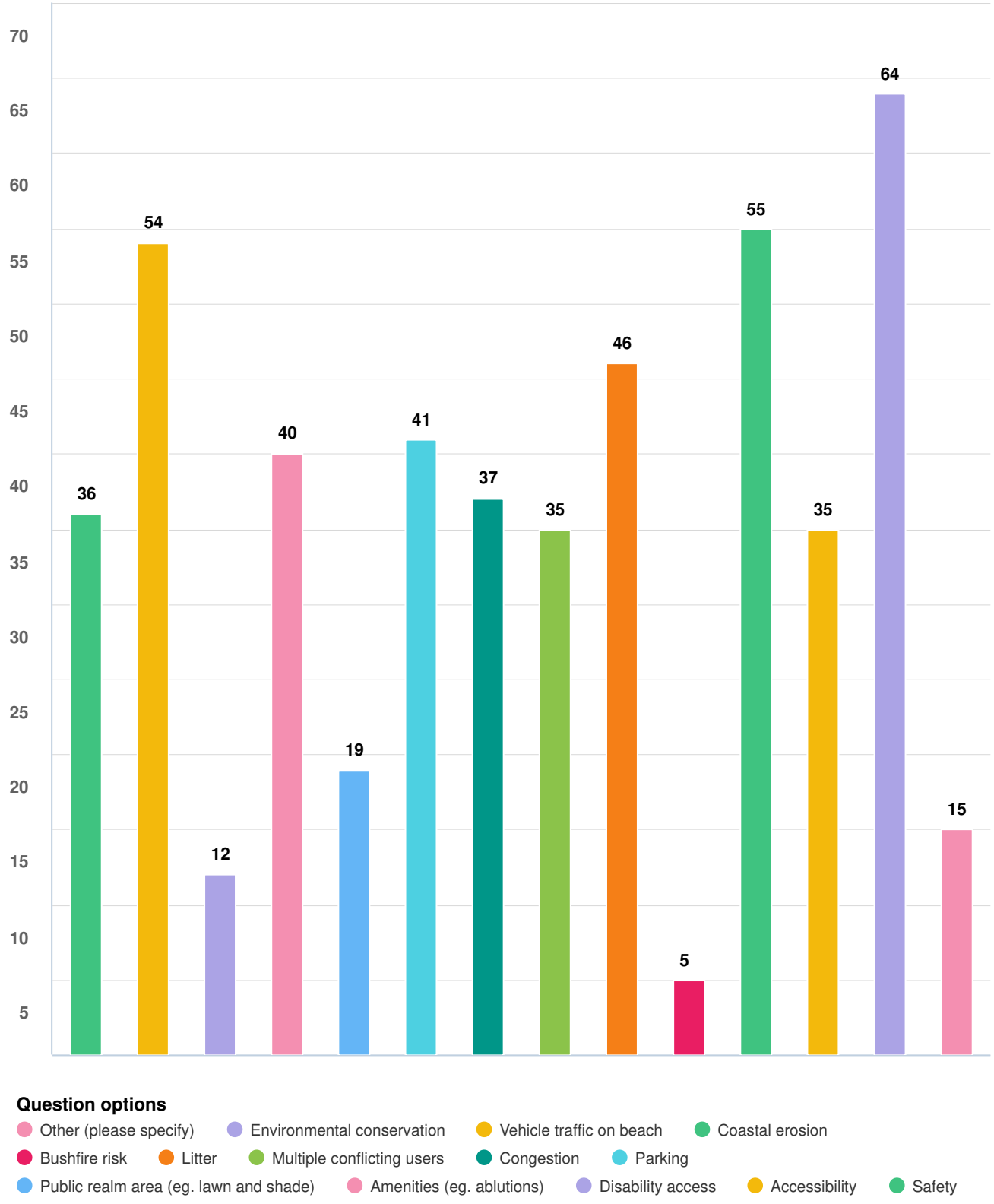
80
90
100

Q16 What are your main areas of concern at your preferred beach(es)? select all applicable



Mandatory Question (140 response(s))
Question type: Checkbox Question

Coastal Reserves Management Strategy

Consultation Outcomes Report

PREPARED FOR

Shire of Denmark

July 2023

landinsights

PLANNING DESIGN ENVIRONMENT

Prepared by:

Land Insights

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Document Name:

Document History:

Date	Document Revision	Document Manager	Summary of Document Revision	Client Delivered
July 23	0	MT	Draft	July 23

Table of Contents

Appendices

1 Introduction

1.1 Background

The Shire of Denmark is currently reviewing its Coastal Reserves Management Strategy. Consultation with the local community and key stakeholders is an integral component of the review process, with the consultation methodology directed by an adopted Stakeholder and Community Engagement Plan. The SCEP identifies a range of consultation and communication activities to provide valuable input into the review process, including a questionnaire and workshops. Consultation is supported by a project Steering Group comprising officers from the Shire, DPLH and local community members.

A community workshop to inform the review of the Shire of Denmark's Coastal Reserves Management Strategy (CRMS) was held in Denmark on the 24th May 2023 with a total of 25 local residents attending.

1.2 Workshop overview

The workshop was facilitated by Ms Liz Jack with assistance from Land Insights and the Shire. The workshop commenced with a brief overview of the previous version of the plan, consideration of current key issues, followed by participant-group discussions. Group discussions comprised the majority of the evening, where three key tasks were addressed:

- Confirm key values/strengths and attractions for each location from the previous version of the CRMS
- Update key issues, concerns and challenges at each location
- Update visions for future use including preferred level of development at each location based on increasing usage and environmental stability.

The workshop was designed to be a collaborative exercise aimed at eliciting views from all participants. To facilitate this, the workshop participants worked in small groups that discussed issues relevant to the coastline that they had the greatest connection to. During the course of the workshop, participants were also asked to move between groups to assist them in obtaining a different perspective when considering an area of the Denmark coastline that they may not have been so familiar with. Plans of each coastal location were provided for reference during the workshop.

This report highlights the key outcomes of the workshop, based around the three key questions outlined above. To provide an accurate representation of discussions during the workshop the comments received from each group have been transcribed directly where possible.

2 Peaceful Bay

2.1 Values

- Coastal Vegetation – access, diversity, pristine
- Simplicity – not overdeveloped
- Bird life and marine life.
- Scenic coastline
- Fishing
- Good ablutions
- Architecture
    - Hamlet atmosphere
    - Old-style famers holiday feel
- Peaceful
- Accommodating to visitors and walkers
- Caravan Park is a good size
- Inlet – pristine nature access from ocean.

2.2 Emerging issues

- (Lack of) Access to walkers in case of emergency
- Coastal vegetation needs protection
- Unplanned use
    - Vehicles off tracks
    - Garden waste dumping
    - Illegal camping
- Reluctance to change beach parking habits
- Parking pressure – boats and cars
- Need to retain clear access to beach for Sea Rescue for safety.

3 Parrys Beach and Boat Harbour

3.1 Values

- Camping, fishing, surfing, pristine coastline
- Dog, horse beach, campfires all year
- Driving on the beach
- Traditional values
    - History
    - Low key
    - Affordable camping
- Volunteer model – guardianship and preservation of community values
- Commercial fishing – historic shacks
- Native flora and fauna
- Boat launching

3.2 Emerging issues

- Convergence of all the community uses of the beach season at high volume
- Illegal camping
- Bottleneck at entry to beach
- Speed limit on beach – rangers required
- Need for better communication from Shire
- Better fire management involving PVMG as stakeholders
- Increase awareness of seabirds
- Lack of rangers at peak times
- More control over money for maintenance
- Local community-based decisions and management at Boat Harbour
- Degradation of carpark, access to beach at Boat Harbour
- (Need?) a 2nd access way to the beach
- Irregular changes to camping pricing
- Erosion of dunes
- Parking
- Mobile phone coverage
- Hilliers Beach – parking/turnaround area
- Boat launching
    - Interaction with swimmers
    - Tides and weed
    - Parking with trailers on beach where campground swimmers will come to
- Vehicle and birdlife interaction at inlet mouth
- History/stories of Parrys – need a museum etc.

4 Back Beach

4.1 Values

- WOW trail – although provide more safe access to cliff edge, and spurs off main trail, to enable better views
- Back Beach 4WD trail – needs good signage regarding difficulty levels
- Beach is pristine
- Beach does not have a high level of use.

4.2 Emerging issues

- Retain access as 4WD only (want to keep it difficult for 4WD not a novice track)
- Unofficial tracks forming – need to be blocked and revegetated
- Stair need attention
- Improved signage is required – safety, experience etc
- Need education regarding responsible 4WD use
- Track can be very challenging when dry
- WOW trail needs more seating.

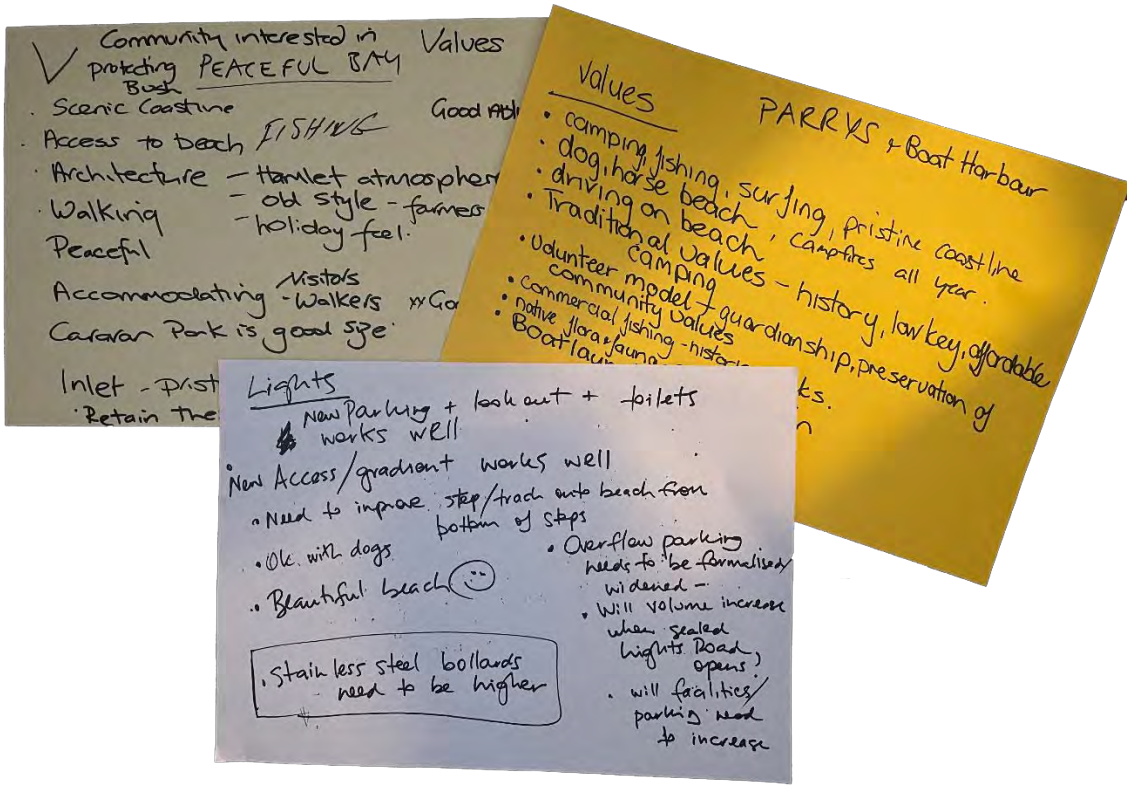
5 Lights Beach

5.1 Values

- New parking, lookout and toilets work well
- New access/gradient works well
- Good dog beach
- Beautiful beach

5.2 Emerging issues

- Need to improve steps/track onto beach from bottom of stairs
- Stainless steel bollards should be higher
- Overflow parking needs to be formalised/widened
- Will traffic volume increase once Lights Road reopens (currently being sealed west of beach to the highway) – and will this lead to a need to increase parking and facilities?
- TransWA bus does not fit in the new carpark – school excursions etc need to pre-reserve parking to allow for the bus to drive around the turning circle – perhaps create a gravel offshoot for busses?
- Need a white line on the entry road from Lights Road for traffic safety
- Cut off 4WD access from the entry road (track up the hill on left approximately 400m before car park).



6 Headland

6.1 Values

- Very beautiful
- Rock fishing
- Whale watching
- Lookout
- Well maintained (can get potholed in winter)

6.2 Emerging issues

- No rubbish bins (people fish in this area) – needs education regarding taking rubbish when you leave.

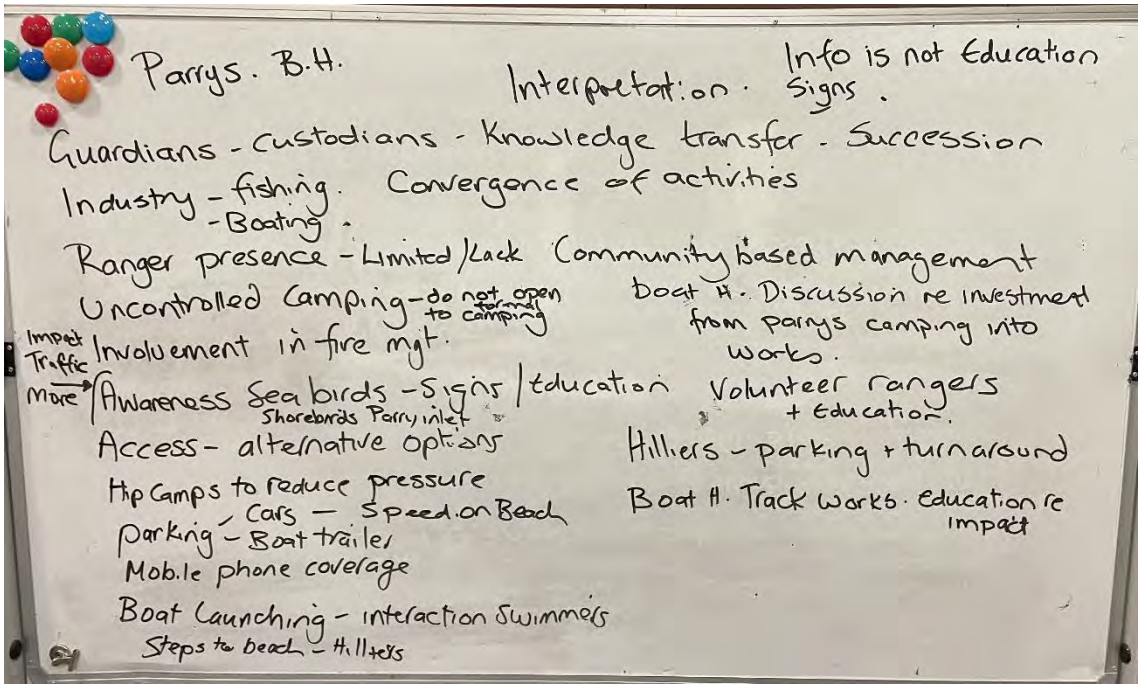
7 Ocean Beach/Prawn Rock Channel

7.1 Values

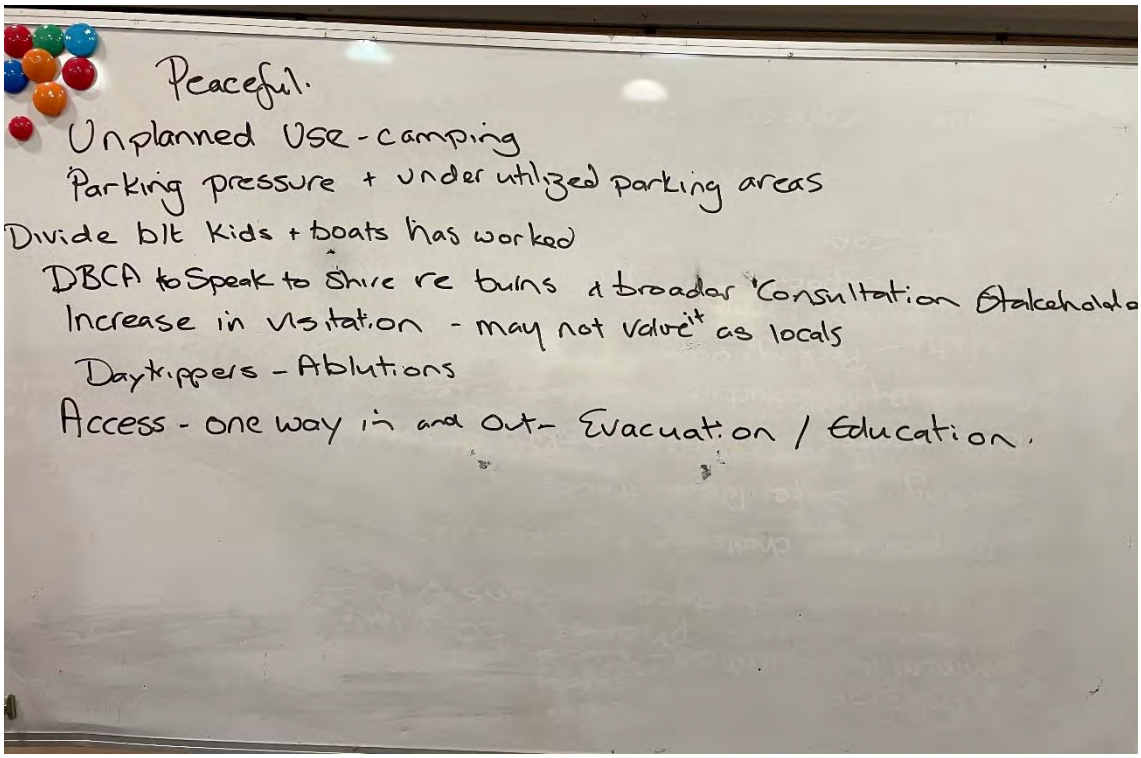
- Accessibility to the community to follow their respective pursuits without impacting on the natural/environmental attributes
- Drawcard for swimming, surfing
- PRC is a safe environment.

7.2 Emerging issues

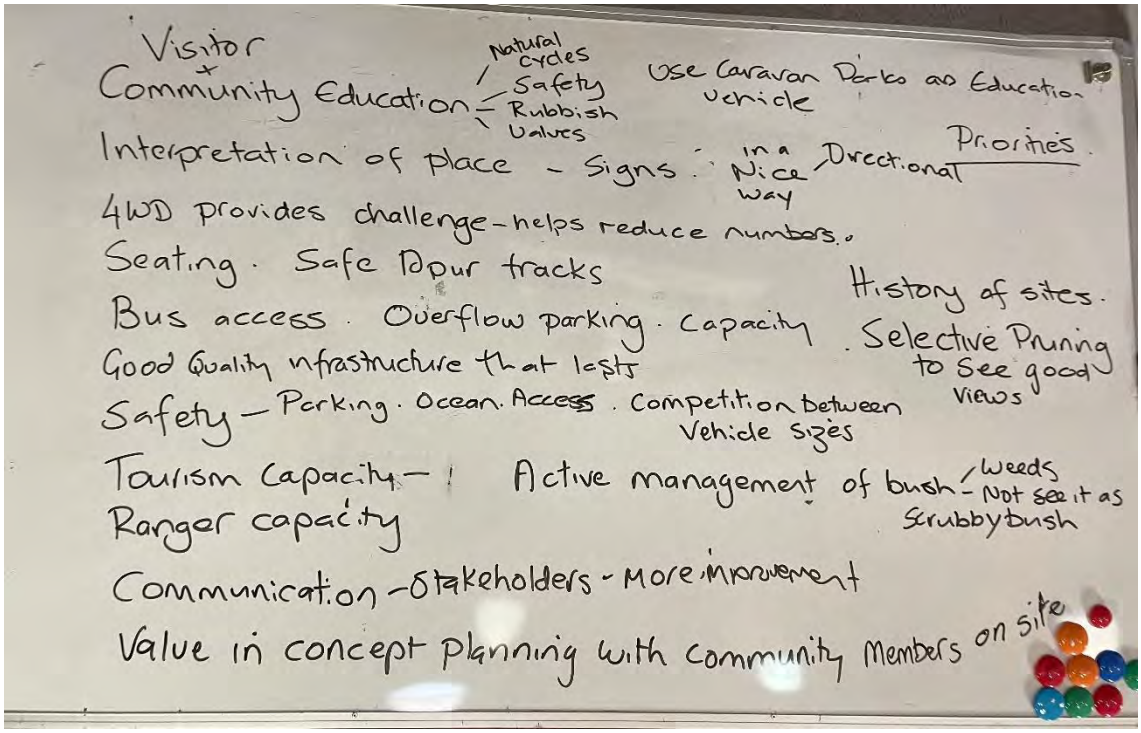
- Increased respect for all features of the natural environment including the bird sanctuary – its unfortunately not always there
- Boat access – safety – has been addressed but not implemented/activated.
- Education and acceptance of beach cycles/erosion (for all beaches)
- Sand bar protocols – continuity of protocol with (departmental) changes of staff
- Inadequate parking and overflow along road creates dangerous driving conditions
- Need to dredge at mouth of inlet to facilitate water exchange in low-flow years
- Heavy vehicle traffic on road past PRC to Ocean Beach – put road in to divert heavy trucks to lime quarry around caravan park.
- Priorities need to be added to the 2010-2020 plan
- Opening of bar – breakwater in front of the surf club limits excavator access which is required.
- Safety
- What is the tourism capacity – i.e. when do you say 'no more'
- Are there sufficient rangers to meet the Shire's legal responsibilities to manage the excessive pressures
- Education of both community and visitors – particularly at Ocean Beach car park
- Facilities need to be built to last – using for instance high specification stainless steel – have a greater investment for longevity
- Require interpretive materials/experiences on new trail at Ocean Beach headland (including signage, interactive displaces and sculptures)



Summary of discussion – Parrys and Boat Harbour



Summary of discussion – Peaceful Bay



Summary of discussion – Lights, Ocean Beach and Prawn Rock Channel

Appendix A

Attendance Register

Coastal Reserves Workshop Register

Shire of Denmark reception Room

Wednesday 24th May 5:30 – 7:30 pm

NAME
Donald Clarke
Jill Shanahan
Ben Norrish
Jesz Fleming
Jenny Brenton
Belinda Dufall
May Carter
Andrew Ellis
John Xanthis
Case Koning
Dea Collen
Graham Dixon
Peter Olden
Wayne Austin
Jill Williams
Brad Kneebone
Nadine Lapthorne
Diane Harwood
Helen Noah

Appendix B

Workshop Presentation

Shire of Denmark

Coastal Reserves Management Strategy and Action Plan 2023 - 2033

Community Workshop

24th May 2023

WELCOME

- The Project
  - A review of the Coastal Management Plan 2010 - 2020 and preparation of a new Coastal Reserves Management Strategy and Action Plan 2023-2033
  - The purpose of the Strategy is to guide the implementation of priority management actions in the Shire's coastal reserves for the next 10 years.
- Tonight
  - Listen to your views on values, issues and opportunities to manage the Shire of Denmark coastal reserves.

AGENDA

5.30 Acknowledgement of Country
Introduction
- Shire Councillors
- Shire Staff/Steering Group Members
- Project Team

5.40 Current Status and brief presentations

6.00 Group Discussions
- Confirm key values/strengths and attractions for each location from previous Plans
- Update key issues, concerns and challenges at each location.
- Update visions for future use including preferred level of development at each location based on increasing usage and environmental stability.

7.00 Next Steps and General Questions (30mins)

7.30 Networking. Workshop ends.

Study Area

- The Study Area includes the Shire's four coastal reserves:
  - Ocean Beach Reserve (including Prawn Rock Channel, Ocean Beach, Back Beach and Lights Beach)
  - Parry Beach Reserve
  - Boat Harbour Reserve
  - Peaceful Bay Reserve

- Why Review the Management Plan?
  - Reflect on what has been achieved over past ten years.
  - Ensure future planning reflects:
    - The current land uses,
    - Impact from changes in population and visitation.
    - Areas that pose potential for conflict between users of the land and water.
    - Identification of strategies, facilities and agencies that can aid future management.

Key Issues - Ocean Beach Reserve

- Ocean Beach Reserve includes Prawn Rock Channel, Ocean Beach, various lookouts, Back Beach and Lights Beach.
- High usage by both resident and visitor population.
- Potential land use conflict regarding access and impacts on reserves.
- Upgrades to inlet access and creation of bird sanctuary underway.
- Restricted vehicle access to the main Ocean beach except the boat launching area at the southern end.
- How do we cater for increased visitation and manage pressure on reserves?
- Which areas require more facilities and if so, what's needed?
- How do we monitor impact of usage.

Map - Ocean Beach Reserve

Map - Ocean Beach

Key Issues - Parry Beach Reserve

- Traditional camping and recreation area for locals and increasingly more visitors.
- How to maintain the traditional values whilst managing visitation, particularly over peak periods.
- Which areas need facilities and if so, what's needed?
- Conflict and safety issues between vehicles driving along the beach, other recreational users and fauna habitat,
- Where would a safer vehicle access area be appropriate?
- Where should a safe boat launching area be delineated?
- National park boundary and user access with dogs.
- Pathways and accesses to Point Hillier pose safety risk.

Map - Parry Beach Reserve

Key Issues - Boat Harbour Reserve

- Impact of vehicle access along the beach on habitat and other uses?
- Uncontrolled informal pathways creating safety risk and environmental damage.
- Access in case of emergencies.
- Preserving the well-managed nature of the beach and surrounding rocks/ dunes from increased visitor numbers.
- Lack of toilet facilities.
- Bush camping and associated impacts during peak periods.

Map - Boat Harbour Reserve

Key Issues - Peaceful Bay Reserve

- Strong community values and pride amongst permanent residents.
- Popular with families and young children.
- Increasing and aging permanent resident numbers.
- Popular tourist destination all year.
- Parking and day use capacity.
- Land use conflict between vehicle access along the beach and other uses
- Are more facilities required and if so, what's needed?

landinsights
PLANNING DESIGN ENVIRONMENT

SHIRE OF DENMARK

Map - Peaceful Bay Reserve

Workshop Format

- Group Discussion
  - Each table represents an individual Reserve
    - Confirm key values/strengths and attractions for each location from previous Plans
    - Update key issues, concerns and challenges at each location.
    - Update visions for future use including preferred level of development at each location based on increasing usage and environmental stability.
- Scribe at each table records all comments - all input has equal value
- Use the maps to mark key elements of the vision your table has for the Reserve
- Move around the room and add comments to other Reserves if you wish.

What's Next?

- Personal meetings with consultants available.
- Coastal Reserves Management Plan community survey. published on the Shire of Denmark Your Denmark page at: https://www.yourdenmark.wa.gov.au/coastal-protection

- This survey will remain live until COB Wed 31 May.
- Hard copies available at the Shire front office counter,
- Draft report available for public review
- Further question, please contact nicole@landinsights.com.au

Thank you for attending.

Please remember to add your name to the mailing list if you wish to be kept up to date.

appendix b

Parry Beach coastal hazard assessment

Seashore Engineering

Coastal Hazard Assessment
Parry Beach, Denmark

Seashore Engineering
November 2023

Report SE145_R01

For: Landinsights and the Shire of Denmark

Executive Summary

Parry Beach Reserve is located approximately 25km west of Denmark township, vested in the shire of Denmark. Parry Beach has been used extensively by locals for social get-togethers and picnics dating back to the 1920's, and has since remained a popular destination for locals and tourists alike. Coastal management is a prominent issue for the reserve.

This scope includes a coastal engineering site inspection and coastal hazard assessment and mapping within the Parry Beach Reserve. The coastal hazard mapping uses the procedures outlined in Schedule 1 of the State Coastal Planning Policy SPP2.6. Recommendations on management of the coastal reserve are provided, in the context of coastal landforms and processes.

The reserve's coastline and the estuarine boundary have 2km of rocky headlands, 2.4km of sandy beaches and approximately 2km of tidal estuary. The beaches are backed by vegetation with young dunes adjacent to the beach with steep slopes and irregular crests. The site is exposed to extreme winds and medium to high exposure to waves.

Planning allowances for coastal processes as defined in SPP 2.6 have been mapped for the 20-, 50- and 100-year planning periods for the Reserve. Coastal inundation has also been mapped within the limitations of available survey data.

Discussion is provided on the practical implications for coastal management over the 10-year planning period of both the coastal landforms identified during the site inspection, and the coastal hazards to these landforms that have been assessed, including erosion of steep foredunes, migration of the Parry Inlet, scour of the creek outlet and longer term coastal erosion.

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Limitations of this Report

This report and the work undertaken for its preparation, is presented for the use of the client. The report may not contain sufficient or appropriate information to meet the purpose of other potential users. Seashore Engineering does not accept any responsibility for the use of the information in the report by other parties.

Acknowledgement

We acknowledge the Traditional custodians of the land and coast on which this report is concerned, the Bibbulmun people.

Document Control

Rev	Issue Description	By	Internal Review	Issue Date	Client Review	Date
A	Draft report for Client review	HD	SB	14/11/2023		

1. Introduction

1.1. BACKGROUND

Parry Beach Reserve (Parry) is located approximately 25km west of Denmark township, vested in the shire of Denmark. The main recreational beach area within Parry Beach Reserve commences at the mouth of the Parry Inlet and extends for approximately 1km south towards a granite hill and rocky headland. Parry Beach is used for a range of activities by locals and visitors, including swimming, surfing, fishing, hiking, boating, dog exercise, 4-wheel driving and other recreational pursuits.

Parry Beach (Parry) is accessed off South Coast Highway from the north along Parry Road. The Reserve is located alongside the Parry Inlet, William Bay National Park and Quarram Reserve. Parry provides public access to the southeast facing coast with pristine beaches, and contains a campground facility, small boat launching access, and a lease with the Denmark Boating and Angling Club (1).

Parry Beach has been used extensively by locals for social get-togethers and picnics dating back to the 1920's, and has since remained a popular destination for locals and tourists alike. As such, coastal management has become a prominent issue for the reserve. In 1987, a draft Coastal Management Plan for the Shire of Denmark was completed (2), which provided initial recommendations and site plans to guide the development of Denmark Shire coastal reserves.

In 2012, a 21-year management agreement was developed between the Shire of Denmark and Parry Beach Voluntary Management Group (PBVMG). The current group of volunteers manage the popular campground and 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 (1).

In February 2011, Landinsights completed the Shire of Denmark Coastal Reserves Management Strategy and Action Plan 2010 – 2020 (3). The document notes the key objectives of management at Parry Beach are **"**to manage Parry Beach Reserve in its present state, maintain its current use as a low-key public camping site and manage the reserve for general recreational land uses while ensuring that activities do not adversely impact on the reserve's natural values or compromise human safety." Key management issues described in the Management Strategy and Action Plan have been summarised:

- Informal camping at the lookout site
- Managing different uses to ensure they do not conflict with each other.
- Managing vehicle access to the beach
- Fire management

1.2. SCOPE OF WORK

This scope of work includes a coastal engineering site inspection and coastal hazard assessments and mapping within the Parry Beach Reserve. The coastal hazard mapping uses the procedures outlined in Schedule 1 of the State Coastal Planning Policy SPP2.6 (4). Recommendations on management of the coastal reserve are provided, in the context of coastal landforms and processes.

Figure 1-1 Parry Beach Reserve (shown in green, R20928).

2. Coastal Setting

The coastline in Parry Beach Reserve has been segment into distinct beach forms, namely (from north to south) Mazzoletti Beach, Parry Inlet, Parry Inlet Beach and Parry Beach (Figure 2-1). The reserve's coastline and the estuarine boundary have 2km of rocky headlands, 2.4km of sandy beaches and approximately 2km of tidal estuary (5).

The beaches are backed by vegetation with young dunes adjacent to the beach with steep slopes and irregular crests on aeolian calcareous deep sands and siliceous sands over sediments and granite. The site is exposed to extreme winds and medium to high exposure to waves (5).

The Mazzoletti Beach is located North of the inlet, and is a slightly curving south to southeast-facing sandy beach. The beach is relatively exposed, with waves up to 2m. Vegetated dunes extend up to 2 km inland in lee of both beaches. A few informal 4WD tracks reach the beach, which is otherwise inaccessible by car, with Parry Inlet on the southern border of Mazzoletti Beach.

Parry Inlet Beach extends from the inlet mouth for 700m to the south, with wave heights decreasing southward (typically up to ~1.5m). The beach initially has a 50m wide surf with occasional beach rips, grading into lower energy low tide terrace, terminating at a small sandy foreland behind a low partly submerged granite rock island. The Parry Road runs 300 m in from the beach, with a vehicle track just behind the beach (6).

Parry Beach commences on the southern side of the foreland/granite island, and curves to the south for 200 m to the start of a 600 m wide granite headland. This beach is protected by the point and reefs, with waves averaging about 1m, which break across a narrow low tide terrace backed by a low gradient beach face. There is a large car park, camping and caravan area behind the southern end of the beach, which is also used to launch small boats.

South of the small Parry Beach settlement is a 20 m high point that forms the western boundary of the Parry beaches, with the larger Point Hillier located 1.5 km to the south. In amongst and between the points are three small beaches, and one main beach 1 km long east facing (Hillier Beach) that connects the northern point with the first rocks of Point Hillier (6).

Figure 2-1 Beaches in Parry Beach Reserve

Parry Inlet is a relatively small inlet for the south coast, with an area of only 1.4 km^2, fed by the Kordabup River. The catchment of Parry Inlet is relatively small, just over 100km^2, of which at least 80% of is cleared farmlands. The inlet breaks out across the junction of Mazzoletti and Parry beaches during winter rains. The Kordabup River is the only river flowing into the estuary. It is estuarine for about 2 km where it borders the north side of a large swamp from which there are drainage channels from the river (7).

The Inlet is a shallow basin with a slightly deeper channel along the eastern shore. The average depth is about 0.5m. The Inlet is surrounded by low, sandy, rush covered shores and has a low rush covered island, the bottom is typically sediment mud over clay.

When the channel opens to the ocean it flows close to the southwestern shore but typically migrates northeast behind the beach and may flow to the sea anywhere within 300m from the southwestern shore. The bar opens naturally or is opened by the Shire in winter (July to September) to prevent flooding of the road along the western shore of the Inlet and of pastures and potato paddocks (8). It may close and open again several times during the winter. The bar now normally closes each summer but is reported to have remained open for five years in the early 1940s. (7).

The sandbar is currently breached by the Shire of Denmark to reduce flooding impacts on Parry Road and adjacent private property. The Shire decides the location of the bar opening in consultation with the Parry Beach Voluntary Management Group (PBVMG). Location is based on achieving maximum initial scouring of the channel and minimum erosion of the coast sandhills on the western bank of the channel. The channel is typically pegged by a representative of the PBVMG prior to excavation commencing (8).

Figure 2-2 Parry Inlet (7).

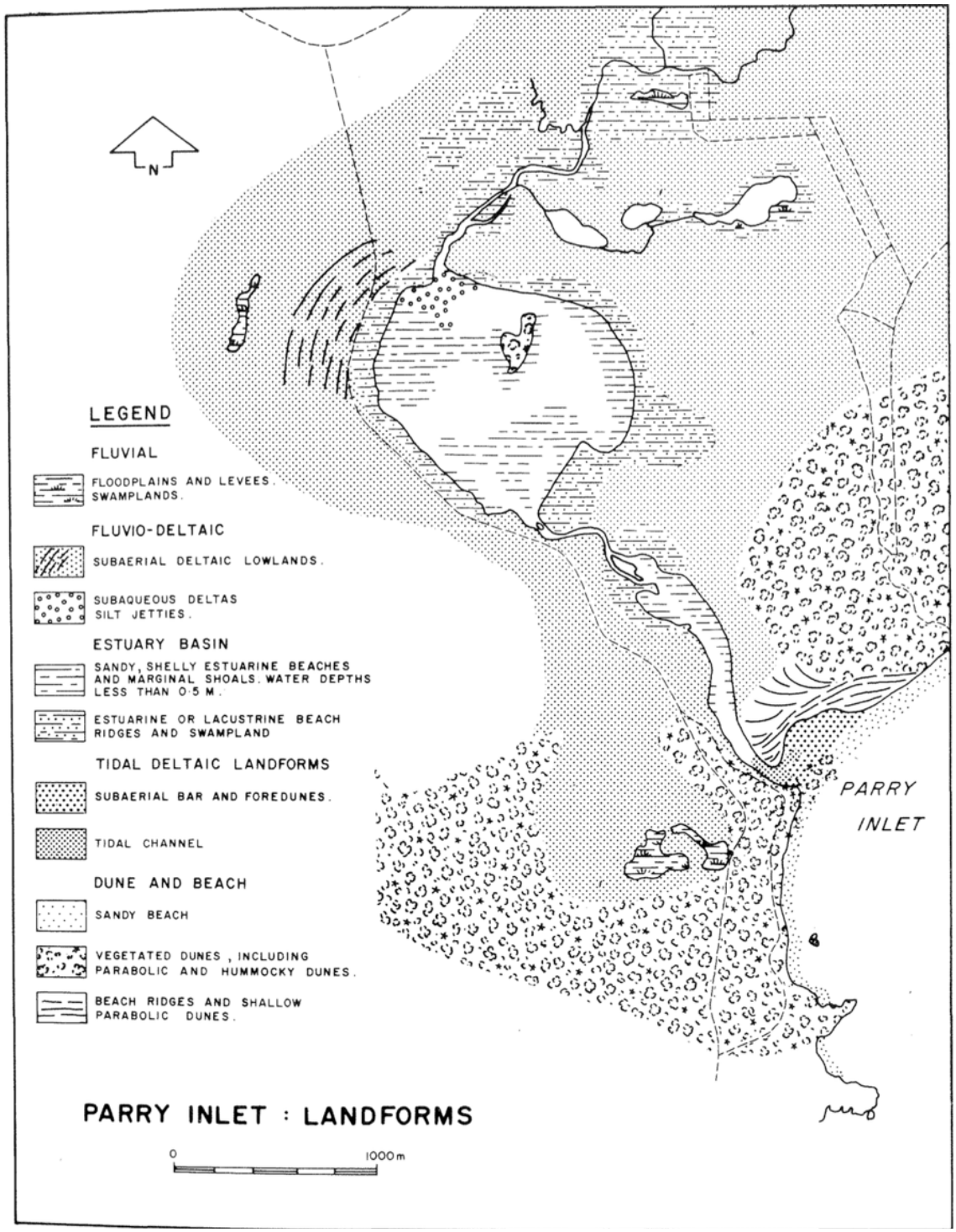

Figure 2-3 Parry Inlet Landforms (7)

There is survey data available from a 2023 UAV shown in Figure 2-5, as well as publicly available topography and bathymetry which has been processed for the purpose of this investigation (Figure 2-4).

Figure 2-4 summary of elevation data at Parry Beach Reserve (inset refers to Figure 2-5 below)

Figure 2-5 summary of elevation data at Parry Beach

3. Site Inspection

A site inspection was undertaken by Seashore Engineering in August 2023. A site inspection report was issued in August 2023 and is provided in Appendix A. Beaches and coastal protection works were inspected from sandy beach north of Parry Inlet to the southern headland at Hillier Beach.

Parry Inlet

Parry Inlet was open during the inspection with a narrow, shallow outflowing entrance channel. Erosion scarps are evident along the southern embankment of the Inlet, adjacent to the access track to the day-use area. A small stand of Ti-trees provided localised stability and the southern entrance dune has localised accretion of foredunes as evident by the establishment of incipient vegetation. Historically this southern dune has experienced erosion. There was localised dune erosion to the north associated with entrance migration, however the accreting dunes to the north of the entrance remain relatively stable.

Parry Beach

The coastal dunes to the south are high and undulating with deep swales behind and relatively wide flat sandy beach in-front. Recent accretion evident north of the creek outlet. The creek 400m to the south of Parry Inlet had scour a deep channel that was actively running through the high dunes, created localised beach erosion. This creek drains relatively large low-lying areas behind the primary dunes. The high dunes and beach to the south were similar in nature to the north of the creek.

A low lying (~2m above sea level) nearshore granite island created a beach salient this is a dynamic but persistent feature. Dune erosion was evident to the north and south of the island. Historic erosion evident along the embayed beach to the south, which is controlled at the southern end by a large granite headland, which extends around to Hillier Beach.

Hillier Beach

Hillier beach is a more exposed, high wave energy beach with nearshore reef platforms, beach cusps and evident of recent foredune accretion. Parry Beach is a low-key campground managed by the Shire of Denmark. In general, asset located close to the coast are both well located and/or relatively low value temporary structures. The main assets are in the campground and well protected by the granite headland and the high foredunes behind the embayed beach south of the nearshore island and headland. Although historic erosion is evident, buffers appear reasonable.

Figure 3-1 August 2023 – Parry Beach

4. Metocean Conditions

A brief assessment has been undertaken of metocean data for the coastal hazard assessment to provide context to the consideration of coastal management options.

4.1. WATER LEVELS

The nearest tide gauge is located in the Port of Albany. Tidal planes for Albany are shown in the table below. These are based on 34yrs of water level recordings in the Port of Albany and are considered broadly representative of the tidal planes at Parry Beach, Denmark. The coastal areas of Denmark experience a maximum tidal range of 1.5m between LAT (Lowest Astronomic Tide) and HAT (Highest Astronomic Tide).

The water level is influenced by non-tidal forcing that result from passing storms and other weather systems. A summary of the tidal levels at Albany is presented in Table 4-1.

Table 4-1 Tidal Planes for Albany (9)**.**

	Tidal Planes[1]				
Water Level	LAT	MLLW	MSL	MHHW	HAT
Albany (m AHD)	-0.72	-0.31	0.00	0.33	0.67
Albany (m CD)	0.0	0.36	0.66	0.99	1.38

Water level records from the Port of Albany tide gauge are available from 1987 to 2022. 5 events have exceeded 0.9mAHD in the past three years. This includes two events in 2020, two events in 2021 and one event on the 13th June 2022, which recorded the highest ever recorded water level of 1.1mAHD.

[1] LAT: Lowest Astronomic Tide, MLLW: Mean Low Low Water, MSL: Mean Sea Level, MHHW: Mean High High Water, HAT: Highest Astronomic Tide, ARI: Average Return Interval.

4.2. WAVES

The coastline within Parry Beach Reserve is a predominantly east/southeast facing coastline. The beaches within Parry Beach Reserve are sheltered from the frequent southwest swells where offshore significant wave heights can exceed 9m. Longer period swell waves refract into the southeast facing beaches, and there is also a relatively direct exposure to less frequent south-easterly swells, which can exceed 7m offshore (Figure 4-1).

Exposure to offshore waves decreases south from Parry Inlet towards the beaches adjacent to the Caravan Park, where the rocky headland and granite island provide greater sheltering. Breaking waves are described as typically being between 1 to 1.5m adjacent to Parry Inlet (Figure 4-2), to 1m further south towards the Caravan Park (6).

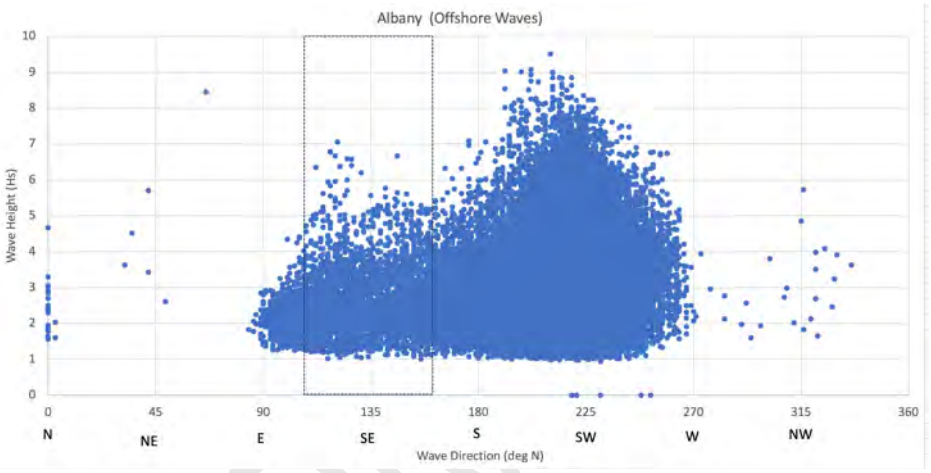

Figure 4-1 Time Series and Cross Plot of Wave Height and Direction Offshore of Albany (2008 – 2021). SE (onshore waves) are show in in the box.

Figure 4-2 Breaking waves near Parry Beach Inlet (June 2022, supplied Shire of Denmark)

4.3. EXTREME EVENTS

Erosive events on the south coast can occur because of high-water levels, high waves (particularly high waves from the southeast direction), as well as the influence of rainfall and the direction of the Inlet opening (8).

The south coast of Western Australia is unique in that high water level events (typically associated with low-pressure systems) do not always occur simultaneously with high wave approaching the coast onshore (waves from the southeast). This is demonstrated by a plot of water levels and waves from 2020 (Figure 4-4), showing separate high wave and water level events, as well as concurrent events that are likely to have caused erosion along the southeast facing beaches.

August 2020 was a particularly erosive month along the south coast beaches, and Ocean Beach (Denmark) as well as some of the east facing beaches in Albany underwent significant erosion. Figure 4-4 shows the waves and water levels for Albany in august 2020, and demonstrates two events where waves from the southeast above 6m, and water levels reached 0.6mAHD (~HAT) during the events. These events have great potential to erode the southeast facing beaches of the south coast.

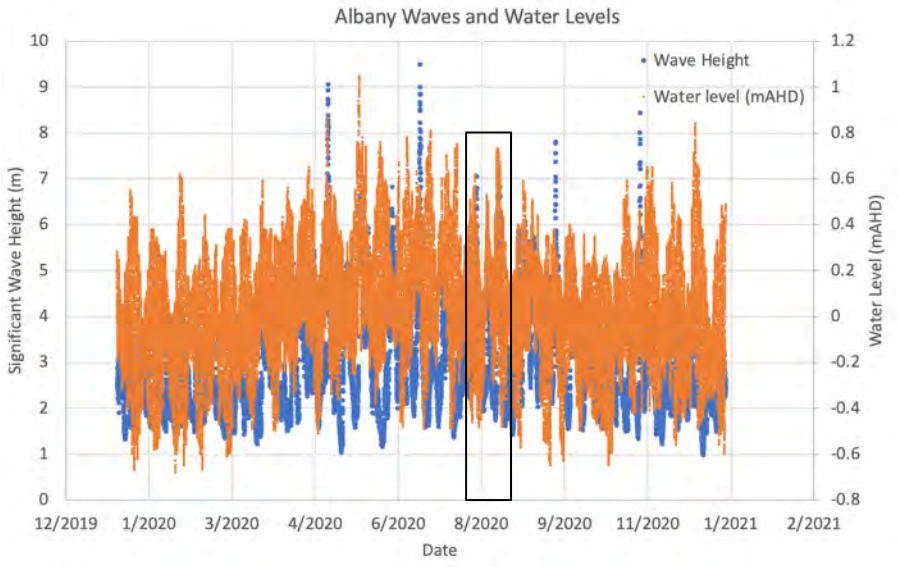

Figure 4-3 Waves and Water Levels for Albany for 2020

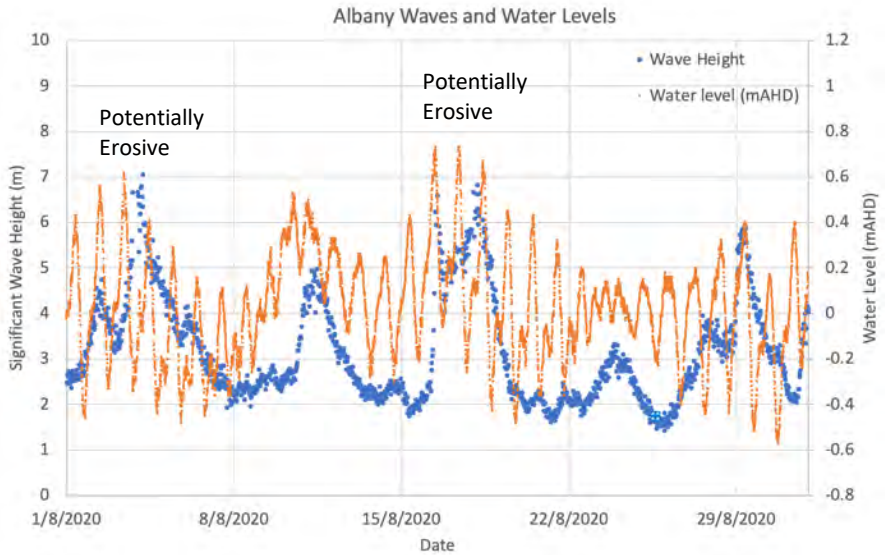

Figure 4-4 Waves and Water Levels for Albany for and August 2020

5. Planning Allowances for Coastal Processes

5.1. COASTAL PROCESS ALLOWANCE MAPPING

Planning allowances for coastal processes has been undertaken using the procedures outlined in Schedule 1 of the State Coastal Planning Policy SPP2.6 (4). This mapping provides an interpretation of areas *potentially* exposed to coastal processes over the relevant planning timeframe.

The application of SPP2.6 for determining coastal processes allowances varies depending on the coastal type. The project scope is diverse and includes hard rock coast, sandy coasts, and dynamic estuary outlets/river mouths.

Sandy Coasts

Sandy Coasts within the Parry Beach Reserve include Parry Inlet Beach, Parry Beach and Hillier Beach. The procedures outlined in Schedule 1 of SPP2.6. for coastal planning allowances sandy coasts requires consideration of four elements. This following has been assumed for the review of coastal planning allowances for this study:

- **S1 Erosion**: Allowance for Current Risk of Storm Erosion: Modelled storm erosion using XBEACH.
- **S2 Erosion**: Allowance for Historic Shoreline Movement Trends: Analysis of vegetation line using 2001 to 2022 imagery to assess current shoreline movement behaviour.
- **S3 Erosion**: Allowance for Erosion Caused by Future Sea Level Rise: Procedure as outlined in SPP2.6 (100 x Sea Level Rise (m))[2].
- **Factor of Safety**: 0.2m/year allowance for uncertainty in coastal assessments.

The sum of the four elements has been offset horizontally from the Horizontal Shoreline Datum (HSD), which has been updated based on the 2023 vegetation line (which typically represents the active limit of storm activity).

Hard Rock Coast

The State Coastal Planning Policy defines rocky coasts as those which comprise a continuous rocky substrate which extends to an elevation above the active limit of the shoreline, which "in most instances this elevation should be at least one metre above the HSD". Some sections of the rocky headland south of Parry Beach is an example of a "hard rock" type of rocky coast. The underlying erosion rate on these coasts is typically zero, and The State Coastal Planning Policy outlines the future risk of erosion should be based on a geotechnical assessment of the shoreline stability (4).

A geophysical assessment by GBG Group in 2023 completed investigations to determine the level of rock along Parry Beach (10) and small section on northern end of the rocky headland. The result demonstrates "Low strength weathered rock" between 1 and 3mAHD behind the visible rocky headland (Figure 5-1), which will provide increased resistance to erosion locally.

[2] The limitations of this simplified approach to determination of planning allowance for coastal response to sea level rise and the Bruun Model are outlined in Pilkey et al (17)

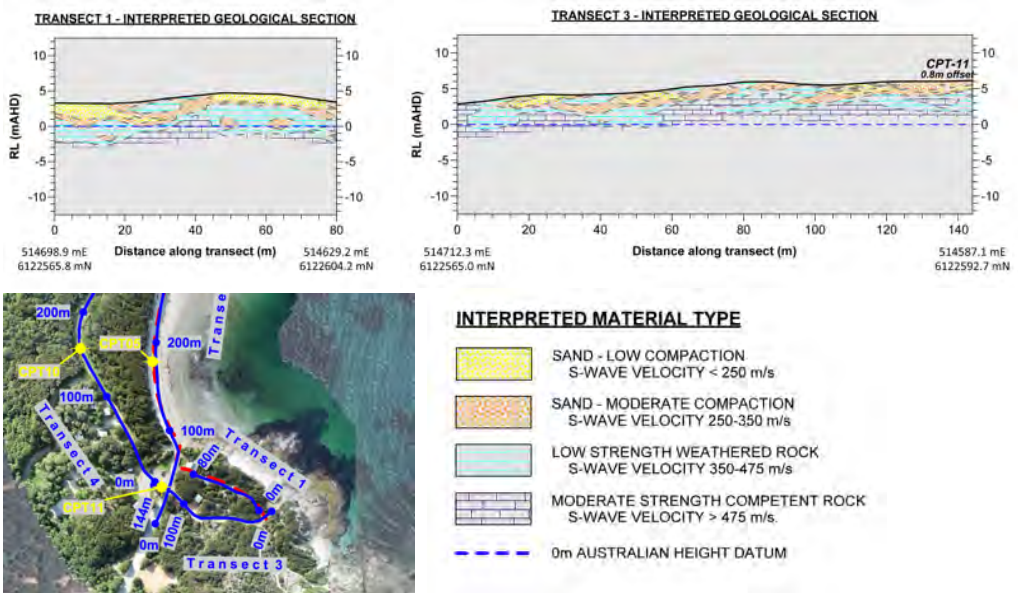

Figure 5-1 GBG Group Geophysical maps of the rocky headland at Parry Beach (10)

However, in the context of SPP2.6, this has been interpreted as too low and variable to be defined as a hard rock coast. The coast has also demonstrated erosion of ~0.2m/yr since 2001 as the vegetation has eroded on the sandy dune which overlies the rock shelf, and this behaviour is not representative of a hard rock coast.

5.2. COASTLINE MOVEMENTS

An assessment has been undertaken of available Landgate historical aerial photography from 2001 to 2023 to assess linear erosion rates at Parry Beach. Six profiles were assessed for coastal change, from Parry Inlet south towards Parry Beach and Caravan Park.

The mouth of Parry Inlet is the most dynamic landform of the section of beach between the Inlet and the Caravan Park Beach, and has demonstrated up to 12m of erosion in one year (2009 – 2010) (Figure 5-2). Further south along Parry Inlet Beach and Parry beach, the coastline has demonstrated an average rate of erosion in other order of 0.5m/year over the past 20 years, with some evidence of larger erosive years followed by moderate recovery. Hillier Beach has demonstrated stability in past 20 years, with no underlying erosion trend observed.

The coastline movement analysis also identified the southern bank of the Parry inlet has been subject to erosion in recent years, with steep scarps evident approximately 150m inland from Inlet Mouth, where there is a narrow buffer (<10m) to the access road. An 80m section of riverbank has demonstrated erosion of ~6m between 2016 and 2020, forming a steep and unstable erosion scarp (Figure 5-3).

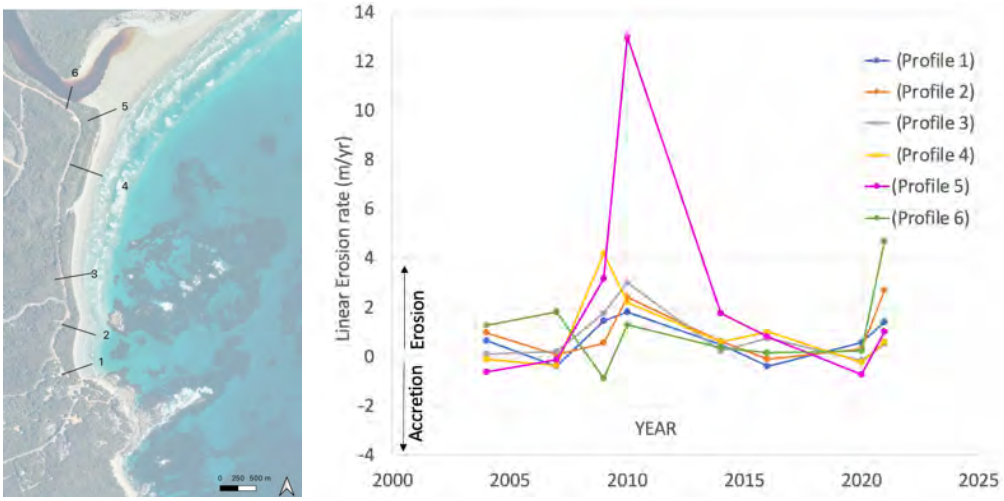

Figure 5-2 Coastline Movements – Parry Beach

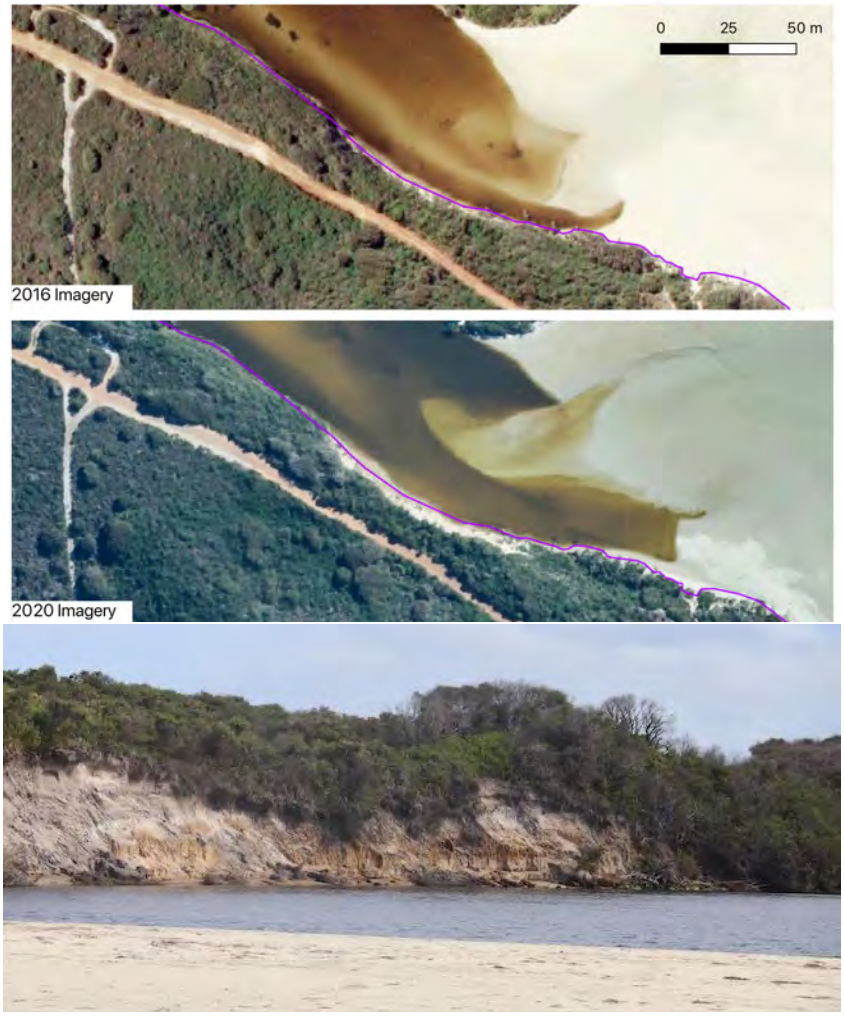

Figure 5-3 Erosion of the southern Inlet Bank showing aerial imagery from 2016 (above) and 2020 (centre), with the 2016 vegetation line shown in pink. Site photo August 2023 is shown below.

5.3. CROSS SHORE EROSION

Three Profiles (Parry Inlet Beach, Parry Beach and Hillier beach) have been assessed for cross shore erosion within Parry Beach Reserve using the cross-shore erosion model XBeach 2D.

XBeach 2D is an open-source software developed by Deltares. It is widely used by coastal engineers, researchers, and other professionals to assess coastal risks, design coastal structures, and evaluate the impact of climate change on coastal regions (2). The inputs for the XBeach 2D modelling as shown in the table below.

5.3.1.1. Definition of the Storm Event

SPP2.6 notes the selection for the storm used for cross shore erosion modelling should "will vary for each location and should be reviewed on a case-by-case basis" (11).

The Department of Transport's recent technical report for design storm event selection for erosion hazard assessment has been considered (12). However, the 100 yr ARI design storm event for the South Coast (Albany) is identified to have peak waves of 8m from the southwest, and strong west north-westerly winds, a 'mean water level' of 0.3mAHD and peak water level in the order of 0.9mAHD. This swell direction is not expected to penetrate the southwest facing coast of Parry Beach directly, wind direction is largely offshore along the shoreline at the site), and peak water level is relatively low.

For the purpose of a 100yr ARI water level for the design storm, a water level of 1.5mAHD has been adopted as the 100-year ARI for this coastal area. The waves have been selected based on the largest wave observed (7m) from a southeast direction (directly onshore) in the available data, and adding a metre (8m significant wave height). A summary of the input parameters and results is provided in Table 5-1 - XBEach Model Set up.

Table 5-1 - XBEach Model Set up.

Attribute	Input
Bathymetry	Cross Section developed using Australian Bathymetry 250m grid, combined with recent (2023) UAV survey of the beach. Cross section extends from ~10m elevation to approximately 3km offshore (approx. 20m water depth).
Water Level	Tidal spectrum developed based on peak steady water levels of 1.5mAHD.
Wave	Offshore wave forced with a significant wave height of 8m, period of 16 seconds.
Model Parameters:	Model Duration: 36hours Sediment D50: 0.3mm Sediment Density: 2650 kg/m^3 Sea Water Density: 1025kg/m3 Max grid size: 2m Minimum grid size: 1m
Runs	10 year Coastal process allowance : 1 times a 100yr ARI Storm 50, 100 year Coastal process allowance: 3 times a 100yr ARI Storm
Results	Parry Inlet Beach : 5m (10yr allowance), 10m (50,100 yr allowance) Parry Beach : 10m (10yr allowance), 20m (50,100 yr allowance) Hillier Beach : 5m (10yr allowance), 10m (50,100 yr allowance)

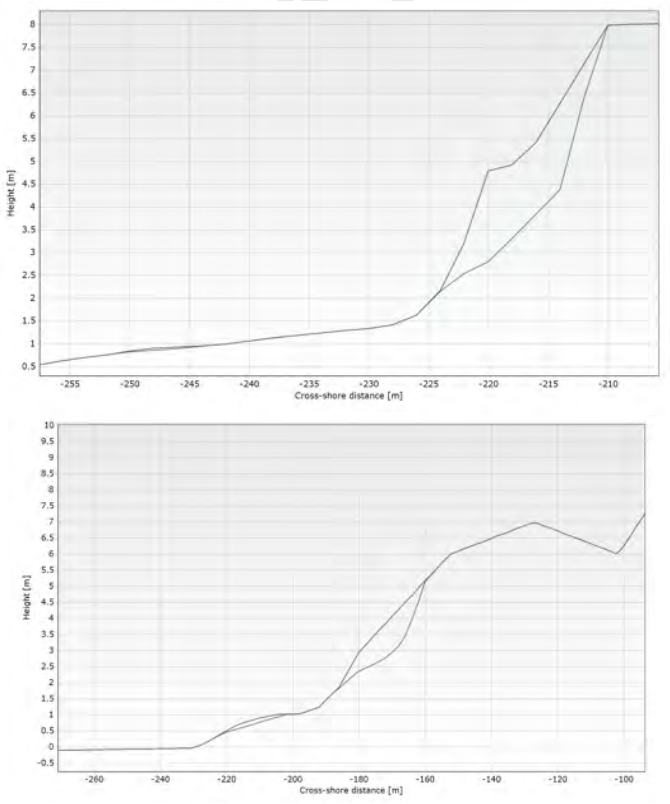

Figure 5-4 Initial (brown) and final (green) beach profile following XBEACH modelling of Parry Inlet beach (above), and Parry Beach (below).

5.4. RESPONSE TO SEA LEVEL RISE

SPP2.6 (11) outlines the allowance for sea level rise should be based on a vertical sea level rise of 0.9 metres over a 100-year planning timeframe to 2110. The allowance for erosion caused by future sea level rise on sandy coast should be calculated as 100 times the adopted sea level rise value of 0.9m over a 100-year timeframe, or **90 metres**.

For context, the average historic annual rate of erosion observed over the past 20 years along Parry Beach is 0.5m/yr, and the allowance of 90m of coastal retreat in 100 years would allow for a doubling of the observed rate of erosion along this foreshore (i.e. 0.9m/yr)

The nominal 90m allowance is based on a simple application the Bruun Rule (13), assumes a beach slope of 1V:100H, and infers that sea level rise will change shelf-shore sediment exchanges, resulting in a net transfer from the coast to the inner shelf (14).

The response of the shoreline within Parry Beach Reserve to rising sea levels may be strongly influenced the large rocky headland, nearshore granite island, Parry Inlet, and the variable shoreline and dune morphology, the Policy does not specifically allow a site-specific assessment of the potential localised response of the shoreline to rising sea levels. For context, a site-specific application of the Bruun Rule based on the beach slope at Parry Beach (approx. 1V:40H) would result in a 36m allowance for 0.9m SLR.

6. Planning Allowances for Coastal Processes (Mapping)

Results of the coastal process allowance mapping is shown in the table below. The figures are based on the sum of the four elements s1 to s4.

Table 6-1 Summary of Planning Allowances for Coastal Process (metres offset from the HSD)

Planning Timeframe	Parry Inlet southern embankment	Parry Inlet southern dune (Delta)	Parry Inlet Beach	Parry Beach	Rocky headland	Hillier Beach
10 year	20	30	20	30	20	20
50 year	90	120	90	100	80	70
100 year	170	220	170	180	140	120

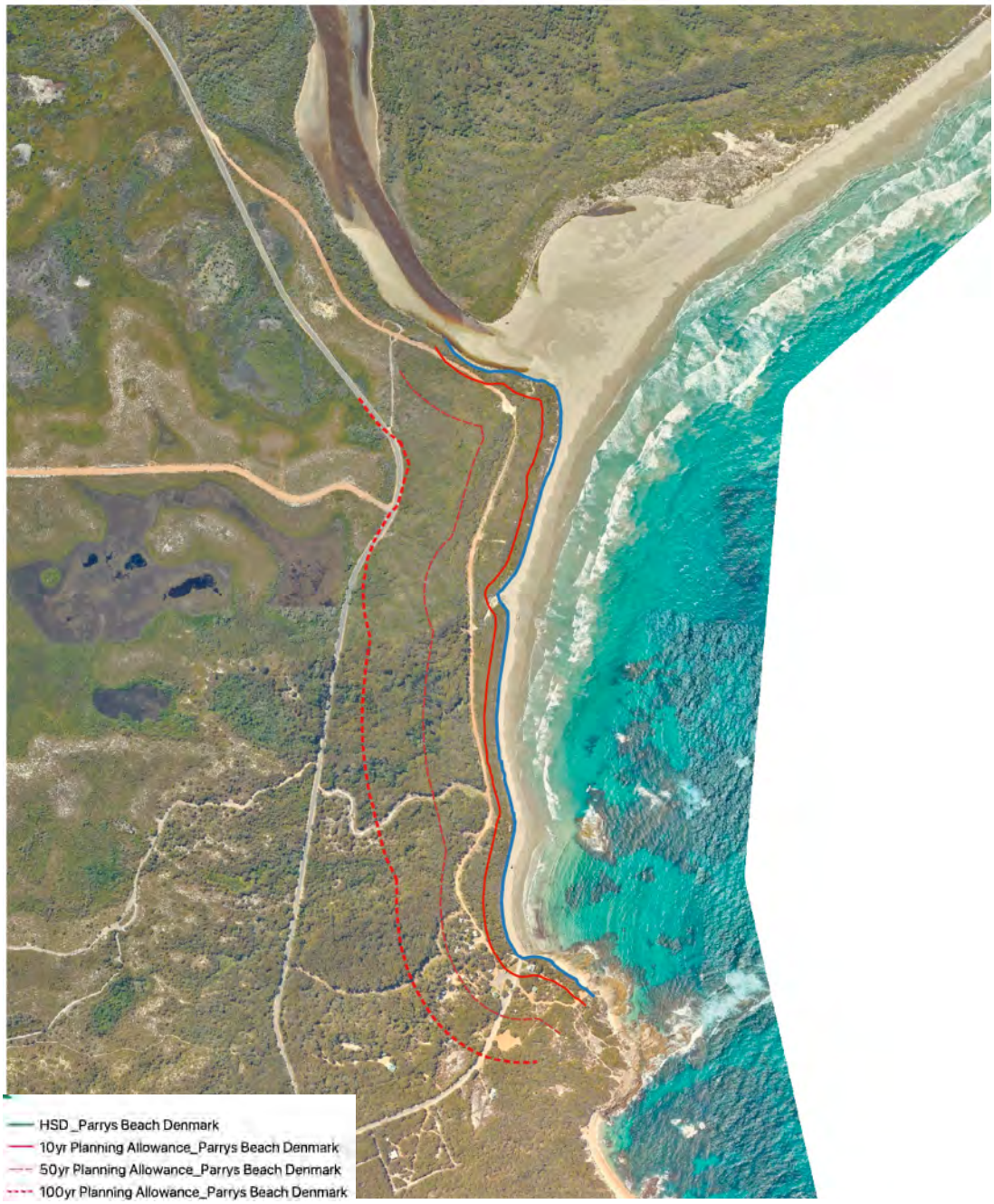

Figure 6-1 Mapping of planning allowances for coastal areas at Parry Beach Reserve

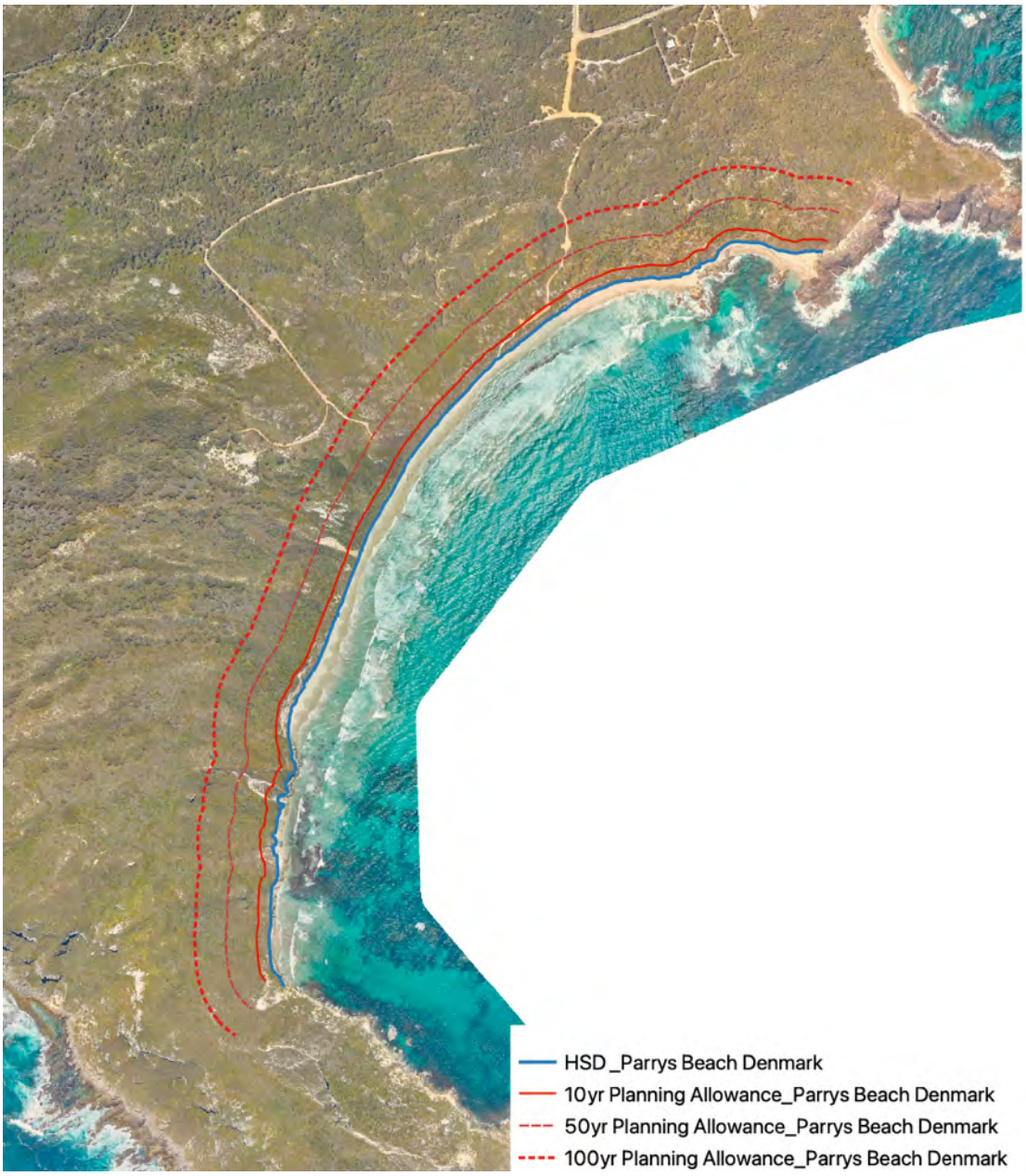

Figure 6-2 Mapping of planning allowances for coastal areas at Parry Beach Reserve (Hillier)

6.1. COASTAL INUNDATION

SPP2.6 outlines the allowance for coastal inundation should be the maximum extent of inundation calculated as the sum of S4 Inundation plus the predicted extent of sea level rise. The allowance for the current risk of inundation is the maximum extent of storm inundation, defined as the peak steady water level plus wave run-up. Furthermore, the storm event for storm surge inundation should be based on ocean forces and coastal processes that have a 0.2 percent or one-in-five hundred probability of being equalled or exceeded in any given year over the planning time frame. An additional 0.9m allowance for sea-level rise over the 100-year planning period is added to the 500yr ARI water level to provide a final level which is typically mapped over the study area using available survey.

There is ~35 years of water level data available from the nearest tide gauge (Albany), extrapolation of a 500-year ARI water event is not appropriate. The City of Albany CHRMAP (15) provides inundation levels for the 100-year planning frame of 2.62m, based on (16). This has been adopted as the proposed maximum extent of inundation.

Available survey of the wider Parry Beach Reserve is limited to a 30m grid, which typically resolves to approximately 5m contours and is not sufficient to map the inundation extents. However, the high-resolution UAV survey of a small section of Parry Beach, completed in 2023, has been used to demonstrate that the vegetation line along Parry Beach is approximately associated with 3mAHD contour. This has been used as a guide to map the inundation allowances. This is valid for a preliminary mapping of the coastal inundation under the guidelines of SPP2.6 only.

Figure 6-3 Mapping of allowance for coastal inundation

7. Coastal Management Recommendations

Discussion is provided on the practical implications for coastal management over the 10-year planning period of both the coastal landforms identified during the site inspection, and the coastal hazards to these landforms. The coastal hazards include erosion of steep foredunes, migration of the Parry Inlet, scour of the creek outlet and longer-term coastal erosion.

7.1. SOUTHERN EMBANKEMENT

Erosion scarps are evident along the southern embankment of the Inlet, adjacent to the access track to the day-use area. There are narrow buffers to the gravel road, and monitoring of the steep embankment is recommended.

Figure 7-1 Southern embankment of the Inlet (narrow buffers to gravel road)

7.2. BEACH ACCESS FOR VEHICLES (PUBLIC SAFETY)

A cutting in the dune 400m to the south of Parry Inlet had been identified by the Shire as a potential second site for vehicle access to the beach, allowing separation between beach users and vehicles along the beaches between the creek and the current access. However, during the site inspection this cutting was associated with the outlet of a creek channel that drains a relatively large body of water to the west of the gravel access road. This had scoured a deep and narrow channel with steep and unstable embankments. The creek outlet was actively running through the high dunes, created localised beach erosion.

This is not considered to be a suitable site for secondary beach access, as it would be sited on an active creek line, require substantial clearing of the adjacent embankments for a suitable cutting, and be subject to ongoing scour and erosion during period of active creek flow.

Figure 7-2 Creek outlet south of Parry Inlet (August 2023)

The southern beach access ramp provides the only reasonable site, from a coastal engineering perspective, for vehicle beach access at Parry Beach. However, safety issues associated with both beach users (including children) and 4WD vehicles using the beach is acknowledged and requires a planning response that may include:

- Upgrades to the day-use area at Parry Inlet including parking.
- Provision of off-beach trailer parking for boat users.
- Seasonal closures of the beach to vehicles unless launching vessels across the beach (i.e. peak season closures).

7.3. BOAT LAUNCHING

Boat launching typically occurs from the beach during calm conditions. At the request of the Shire, the rocky headland immediately south of Parry Beach campground was inspected for the potential to relocate boat launching to this site and separate vehicles and beach users. Whilst the sheltered bays adjacent to the rock headland may allow very small vessels to be launched under very calm conditions, to site is not considered safe to offer vessel launching in the longer term due to the presence of rock and reef, poor traction (slippery surface) and high exposure to waves and surge.

Figure 7-3 Rocky Headland at Parry Beach

7.4. BEACH ACCESS STAIRS

Beach access stairs at Hiller Beach were inspected and provided good access to beach users. It is understood undermining of this structure has occurred in the past. The current design is reasonable for the beach which has been recently accreting, but should continue to be inspected after storms and adapted to ensure the lower stars are level flush with the beach.

Figure 7-4 Timber Access stairs at Hillier Beach in June 2022 (left) and August 2023 (right)

7.5. COASTAL ADAPTATION

The coastal hazard mapping identified a small number of structures within the 20-year allowance for coastal processes. Coastal buffers should continue to be monitored, particularly to the campground managers building, however there is not considered to be any short-term requirement for relocation of major structures.

8. References

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11. Western Australian Planning Commission. Statement of Planning Policy No. 2.6: State Coastal Planning Policy. Government of Western Australia, Perth; 2012.
12. MP Rogers & Associates. Design Event Selection for Erosion Hazard Assessments. 2018.
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Appendix A Site Inspection

SITE INSPECTION REPORT No.01	**Denmark Foreshore Management Plan – Parry Beach Coastal Hazards**	Date: 24/08/2023 Time: p.m.
Client	Land-insights / Shire of Denmark	
Inspection by:	Stuart Barr (Seashore Engineering)	
Synopsis	Site inspection for coastal hazard study. In general assets are well located to mitigate risk of coastal hazards, apart from the temporary Salmon lookout. High coastal dunes and inlet show evidence of historic erosion, with localised accretion evident is some sections.	
Contract Personnel	Yvette Caruso, Michael Taylforth.	
Weather	Fine conditions. Low to moderate wave heights (Hs = 2.0-2.5m at Torbay, Tp = 13sec). Tides were moderate to low (0.4-0.5mCD).	
Observations - Coastal Geomorphology /Processes	Beaches and coastal protection works were inspected from sandy beach north of Parry Inlet to the southern headland at Hillier Beach. Parry Inlet was open during the inspection with a narrow, shallow outflowing entrance channel. Erosion scarps are evident along the southern embankment of the Inlet, adjacent to the access track to the day-use area. A small stand of Ti-trees provided localised stability and the southern entrance dune has localised accretion of foredunes as evident by the establishment of incipient vegetation. Historically this southern dune has experienced erosion. There was localised dune erosion to the north associated with entrance migration, however the accreting dunes to the north of the entrance remain relatively stable. The coastal dunes to the south are high and undulating with deep swales behind and relatively wide flat sandy beach in-front. Recent accretion evident north of the creek outlet. The creek 400m to the south of Parry Inlet had scour a deep channel that was actively running through the high dunes, created localised beach erosion. This creek drains relatively large low-lying areas behind the primary dunes. The high dunes and beach to the south were similar in nature to the north of the creek. A low lying (~2m above sea level) nearshore granite island created a beach salient this is a dynamic but persistent feature. Dune erosion was evident to the north and south of the island. Historic erosion evident along the embayed beach to the south, which is controlled at the southern end by a large granite headland, which extends around to Hillier Beach. Hillier beach is a more exposed, high wave energy beach with nearshore reef platforms, beach cusps and evident of recent foredune accretion.	
Design Considerations (Coastal Adaptation)	Parry Beach is a low-key campground managed by the Shire of Denmark. In general, asset located close to the coast are both well located and/or relatively low value temporary structures. The main assets are in the campground and well protected by the granite headland and the high foredunes behind the embayed beach south of the nearshore island and headland. Although historic erosion is evident, buffers appear reasonable.	

SITE INSPECTION REPORT No.01	**Denmark Foreshore Management Plan – Parry Beach Coastal Hazards**	Date: 24/08/2023 Time: p.m.
	The key coastal management issue for consideration in the Foreshore Management Plan include: • Longer term management triggers for asset retreat, if required. • Recreational amenity provided by allowing 4WD beach access for fishing, surfing etc. • Vehicle beach access in the context of the southern beach access ramp providing the only reasonable site for vehicle beach access in the area. The creek is not a suitable access point and the high, undulating and erosion dunes north of the campground do not provide suitable locations for alternate 4WD beach access. • Foredune stabilisation on beaches used by 4WD vehicles. • Potential improvements to Parry Inlet day-use area, which provides reasonable walking access to the Inlet, the beach north of the Inlet and local surf breaks. • Potential for providing improved off beach boat trailer parking. • Beach access structure design and maintenance (Hillier Beach). • Beach safety.	
General Notes: Site inspection was undertaken following mapping of coastal vegetation lines from 2001 to 2021, which show an historic erosion rend on the high coastal dunes between the campground and the Inlet. This will be used to map planning allowances for coastal processes.		

SITE INSPECTION REPORT No.01	Denmark Foreshore Management Plan – Parry Beach Coastal Hazards	Date: 24/08/2023 Time: p.m.

Parry Beach 2021 imagery showing key geomorphic features and Shire assets. Note 2001 coastal vegetation line shown in yellow, and 2021 coastal vegetation line shown in red.

Parry Inlet (left) with erosion along the southern bank, and beach to the north of entrance bar (right). Entrance channel was shallow and able to be crossed by 4WD vehicles.

SITE INSPECTION REPORT No.01	Denmark Foreshore Management Plan – Parry Beach Coastal Hazards	Date: 24/08/2023 Time: p.m.

Coastal dunes on southern side of entrance are highly mobile, although incipient coastal vegetation indicates recent localised accretion.

High coastal dunes between Parry Inlet and creek. Recent accretion of foredune observed. Dune sa re very high and undulating with deep swales behind the primary dune. Beach is wide.

SITE INSPECTION REPORT No.01	Denmark Foreshore Management Plan – Parry Beach Coastal Hazards	Date: 24/08/2023 Time: p.m.

Creek between entrance and salient. This is an established creek line that drains larger low-lying areas within swales behind the dunes. Recent erosion evident on northern side with deep narrow gully between high dunes.

Local salient due to nearshore island. This provides control of embayed beach to the south. Foredune erosion evident to north and south of salient, with wide flat sandy beach.

SITE INSPECTION REPORT No.01	Denmark Foreshore Management Plan – Parry Beach Coastal Hazards	Date: 24/08/2023 Time: p.m.

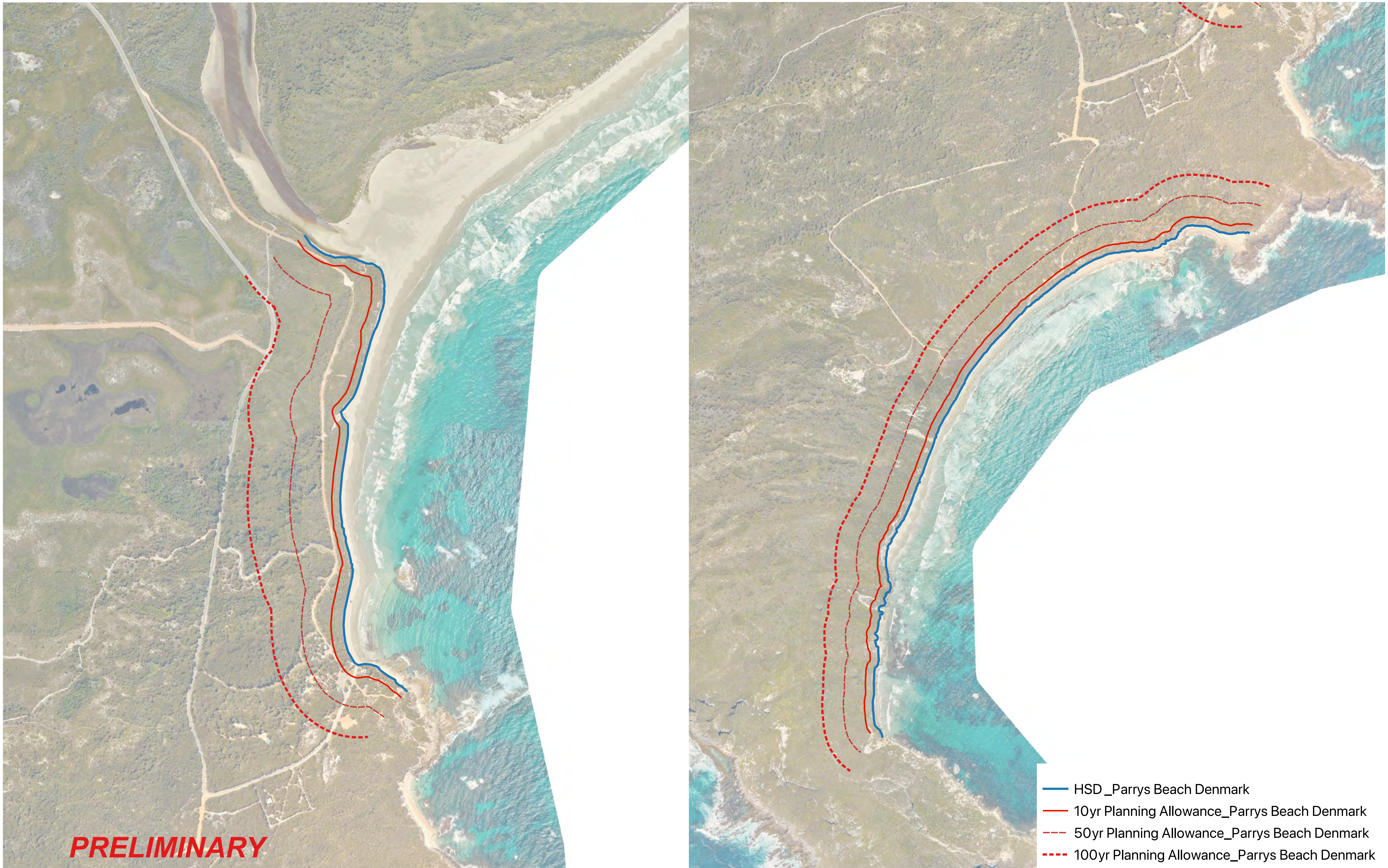
Embayed beach between salient and campground vehicle beach access ramp. Beach access is at a low point in the dunes at the southern end of the beach adjacent to the rocky headland. Coastal dunes show evidence of historic erosion, with moderate wrack accumulations on beach.

Rocks headland provides a control at the southern end of the beach. Offshore reefs dissapate wave energy.

SITE INSPECTION REPORT No.01	Denmark Foreshore Management Plan – Parry Beach Coastal Hazards	Date: 24/08/2023 Time: p.m.

Hillier Beach to the south. Higher energy beach with greater exposure to the southwest. Nearshore reff platforms, moderately wide undulating sandy beach with beach cusps, and steep high dunes with recent evidence of accretion. Beach access stairs were functional.

Appendix B Coastal Process Mapping



REVN	DATE	AMENDMENT	DRN	DESIGN APPROVAL
A	16/10/23	PRELIMINARY	HD	SB

ORIG SIZE A3
ARCHIVE afp://shorecoastal.local/ShoreCoastal/2 Shore Coastal Projects/1411 AMRSC Coastal Hazards/2 References/Drawings/WIP/GIS
PROJECT No 2305

NOTES:
1. AERIAL IMAGE 2023.
2. ALLOWANCES ARE BASED ON AVAILABLE DATA AT THE TIME OF STUDY.

SCALE 1:8,000
50 0 50 100 150 200

DATUM
VERTICAL AUSTRALIAN HEIGHT DATUM (AHD)
HORIZONTAL MAP GRID OF AUSTRALIA, BASED ON GDA94

ACTION	NAME	SIGNATURE	DATE
ENGINEER	SB		10/10/23
DRAWN	HD		10/10/23
ENGINEERING CHECK			
DRAFTING CHECK			
APPROVED PROJECT MANAGER	SB		10/10/23

Seashore Engineering

SHIRE OF DENMARK
PARRYS BEACH
PLANNING ALLOWANCES
FOR COASTAL PROCESSES

DRAWING NUMBER SE145_01_01 REVN A

REVN	DATE	AMENDMENT	DRN	DESIGN APPROVAL
A	16/10/23	PRELIMINARY	HD	SB

ORIG SIZE A3 | ARCHIVE afp://shorecoastal.local/ShoreCoastal/2 Shore Coastal Projects/1411 AMRSC Coastal Hazards/2 References/Drawings/WIP/GIS | PROJECT No 2305

NOTES:

1. AERIAL IMAGE 2023.
2. ALLOWANCES ARE BASED ON AVAILABLE DATA AT THE TIME OF STUDY.

SCALE 1:8,000

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DATUM

VERTICAL AUSTRALIAN HEIGHT DATUM (AHD)

HORIZONTAL MAP GRID OF AUSTRALIA, BASED ON GDA94

ACTION	NAME	SIGNATURE	DATE
ENGINEER	SB		10/10/23
DRAWN	HD		10/10/23
ENGINEERING CHECK			
DRAFTING CHECK			
APPROVED PROJECT MANAGER	SB		10/10/23

Seashore Engineering

SHIRE OF DENMARK
PARRYS BEACH
PLANNING ALLOWANCES
FOR COASTAL INUNDATION

DRAWING NUMBER SE145_01_02 REVN A

appendix c

Ocean Beach concept plans (current)

OCEAN BEACH REDEVELOPMENT

LANDSCAPE DRAWINGS

STAGE 1 WORKS

SHEETS:

NOV. 2023

REV	DESCRIPTION	DATE
REV 1	TENDER	07.11.23

TENDER ISSUE

Doug Simpson
p. 0434 229 122
e. dougdrum68@gmail.com

DRUM
landscape architecture

GENERAL NOTES:

1) THE LANDSCAPE ARCHITECTURE PLANS SHOW THE LAYOUT OF THE PROPOSED PUBLIC REALM AREA INCLUDING PARKING SPACES, RETAINING WORKS, DECKING & BEACH ACCESS, PAVED & LAWN AREAS, GARDENS AND FURNITURE AND ASSOCIATED WORKS. REFER TO DRAWINGS FOR EXTENT OF STAGE 1 WORKS

2) ALL DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL & ENGINEERING DRAWINGS AND SPECIFICATIONS.

3) ELECTRONIC DRAWINGS (AUTOCAD) AVAILABLE FOR SURVEY SETOUT FROM DRUM Landscape Architecture (DLA) REFER TO ENGINEERING DRAWINGS AND SPECIFICATION FOR ALL ROAD AND CAR PARK DESIGN AND SETOUT INCLUDING SUB-GRADE PREPARATION, DRAINAGE, EROSION CONTROL, TRAFFIC SIGNAGE, LINE MAKING. REFER TO LANDSCAPE ARCHITECTRAL DRAWINGS FOR ALL OTHER ITEMS LISTED ABOVE; ELECTRONIC SURVEY AVAILABLE.

5) DRAWINGS AND SPECIFICATION FOR EARTHWORKS INCLUDING GRADING DESIGN, LEVELS AND CUT/FILL QUANTITIES BY ENGINEER.

6) SETOUT OF ALL WORKS TO BE APPROVED ON SITE BY SUPERINTENDENT OR LANDSCAPE ARCHITECT PRIOR TO COMMENCEMENT OF WORKS.

7) LOCATIONS AND ALIGNMENTS FOR FACILITIES INCLUDING STRUCTURES, GATHERING AREAS, PATHS, FURNITURE AND SIGNAGE TO BE APPROVED BY SUPERINTENDENT.

8) ON SITE LAY-DOWN AREA FOR MATERIALS TO BE CONFIRMED WITH SUPERINTENDENT.

9) ALL VEHICLES AND MACHINERY SHALL BE CLEAN PRIOR TO DELIVERY TO SITE AND MUST BE LEAK, WEED, SEED, SOIL AND FERAL FREE. TREATMENT METHOD TO BE APPROVED BY SoD SUPERINTENDENT.

10) ALL EXISTING VEGETATION TO BE RETAINED UNLESS DIRECTED OTHERWISE BY SoD SUPERINTENDENT. THERE SHALL BE NO DISTURBANCE TO AREAS AND VEGETATION OUTSIDE THE PROPOSED WORKS AND DISTURBANCE IS TO BE KEPT TO A MINIMUM AT ALL TIMES.

DEMOLITION:

1) REFER ARCH DRAWINGS AND SPECIFICATIONS FOR EXTENT OF DEMOLITION WORKS.
2)ALL EXISTING SERVICE LOCATIONS TO BE DETERMINED PRIOR TO COMMENCEMENT OF WORKS.
3) CONFIRM TIMING FOR REMOVAL OF EXISTING TOILET BUILDING WITH SoD SUPERINTENDENT PRIOR TO COMMENCEMENT OF DEMOLITION WORKS. REMOVAL OF TANKS AND EFFLUENT SHALL CONFORM TO SoD AND HEALTH DEPARTMENT REQUIREMENTS.
4) REFER TO DEMOLITION PLAN AND STAGING FOR EXTENT OF DEMO WORKS.
5) EXISTING PATROL BUILDING SHALL BE DEMOLISHED AS PART OF THE SEAWALL CONSTRUCTION WORKS (BY OTHERS).

SITE PREPARATION:

1) ALL VEGETATION CLEARING TO BE CONFIRMED WITH SoD SUPERINTENDENT ON SITE.
2) TOPSOIL TO BE STOCKPILED FOR RE-USE AS DIRECTED BY SoD SUPERINTENDENT.

REHABILITATION AREAS (BY CIVIL CONTRACTOR):

RE-SPREAD TOPSOIL/ VEGETATION MIX OVER DISTURBED AREAS USING MATERIAL STRIPPED DURING CLEARING.

GRADING - GENERAL:

1) PROVIDE 1.5-2% FALL AWAY FROM BUILDING PADS (REFER PLANS FOR FALLS).
2) PATHS TO BE 1:14 OR FLATTER WHERE POSSIBLE WITH 1:10 MAX. GRADE TO COMPACTED GRAVEL OR FINES SURFACES.
3) PATH CROSS FALL 1.5-2% TYPICAL TO FOLLOW NATURAL SURFACE SLOPE.
4) MINIMISE WIDTH OF BATTERS TO REDUCE ENVIRONMENTAL DISTURBANCE.
5) EARTH BATTERS AS NOTED, 1:2 OR 1:1.5 GRADE TYPICAL.
6) PROVIDE 300mm MIN. APRON TO PATHS, PAVING AND RETAINING WALLS WHERE SURROUNDING TERRAIN IS STEEPER THAN 1:6.

STONE PITCHING (BY CONTRACTOR):

LOCALLY SOURCED LIMESTONEE SPALLS,100mm - 200 Ø TYP.
IF MORTAR REQUIRED USE CREAM COLOURED CEMENT.
NOTE: PROVIDE SAMPLE OF SPALLS AND MORTAR COLOUR FOR APPROVAL BY DBCA LANDSCAPE ARCHITECT AND SUPERINTENDENT.

BOLLARDS (BY CONTRACTOR):

- STANDARD - 200DIA x1200 ROUND (TURNED) TREATED PINE WTH 'DOME TOP'. INSTALL BOLLARDS TO 600mm AGL, NOMINAL SPACING AS NOTED. (6 OF)
- UNIV. ACCESS BAY SHARED ZONE BOLLARD - REFER DETAIL (1 OF)
- FOLDABLE BOLLARDS (2 OF) - Fold Down Bollards - Key Lockable 'AUSTRALIAN BOLLARDS MODEL # AB-FD150KL-Y' WHITE COLOUR. INSTALL TO MANUFACTURERS RECOMMENDATIONS

MATERIALS:

CARPARK (BY CIVIL CONTRACTOR):

BLACK ASPHALT SEAL TO PROPOSED CARPARK .

ENSURE EXPOSED ASPHALT EDGES ARE FINISHED NEATLY AND FOLLOW ALIGNMENTS SET OUT ON ENGINEERING PLANS.

REINFORCED FLUSH KERBING (FK) (BY CIVIL CONTRACTOR):

ALL FLUSH KERBING TO BE REINFORCED AND IN STANDARD GREY CONCRETE AS PER DETAIL.

WHEEL STOPS (BY CIVIL CONTRACTOR):

REINFORCED PRECAST CONCRETE WHEEL STOPS IN STANDARD GREY CONCRETE.

CONCRETE COLLECTOR PATHS AND APRON AROUND PUBLIC AMENITIES BUILDING (BY CIVIL CONTRACTOR):

REINFORCED INSITU INTEGRALLY COLOURED CONCRETE AS DETAILED.

REFER TO ADJACENT NOTES FOR FINISHES.

RETAINING WALLS (BY CONTRACTOR):

RECONSTITUTED LIMESTONE BLOCKS 1000x350x350.

BLOCKS SHALL BE 'SQUARE EDGED' WITH NO CHAMFERS

INSTALL WITH 20mm MORTAR JOINT (TYP.)

MORTAR SHALL BE M4 EQUIVALENT TO AS3700. COLOUR TO MATCH BLOCKS AND TO FINISH FLUSH WITH FACE OF WALL

WHERE WALLS ARE CURVED, BLOCK SHALL BE CUT TO FOLLOW RADIUS AS SHOWN TO ENSURE AN EVEN, CONSISTENT CURVE. REFER TO DETAIL FOR EXAMPLE.

SHOWERS (OUTDOOR):

CARPARK (BY CIVIL CONTRACTOR):

SUPPLY AND INSTALL 2 (OF) 'RAINWARE 5003

Beach Solo' SHOWER AS PER MANUFACTURERS SPECIFICATIONS.

REFER SH04 FOR DETAILS AND SETOUT.

CONNECTION BY LICENCED PLUMBER AS PER SPEC.

BRICK PAVING (AROUND DSLSC)

CONTRACTOR SHALL REMOVE EXISTING PAVING AROUND BUILDING AND REPLACE TO EXTENTS SHOWN ON DRAWINGS.

CONTRACTOR SHALL USE PAVERS FROM DEMOLISHED PATROL BUILDING (CREAM COLOURED ONLY).

CONTRACTOR TO CONFIRM QUANTITIES REQUIRED. IF EXTRA ARE NEEDED THE CONTRACTOR SHALL SOURCE SIMILAR APPROVED PRODUCT REQURIED TO COMPLETE JOB. (ASSUMED 88m2 AVAILABLE, 120m2 REQUIRED - TBC)

ALL PAVERS TO BE LAID ON COMPACTED CLEAN SAND.

INSTALL EDGE BEAM USING GREY CEMENT AFTER LAYING.

FALL AWAY FROM BUILDING 1.5-2% TYP.

PATTERN TO BE 90DEG HERRINGBONE

DRAINAGE MATERIAL (BASE OF RET. WALL & ADJACENT TO DSLSC STORAGE)

CONTRACTOR SHALL SUPPLY & INSTALL DRAIN TO BASE OF RETAINING WALLS WHERE SHOWN. REFER TO ENG. DRAWINGS FOR DETAILS.

SURFACE STONE SHALL BE 'BREMER BAY DRAINAGE RUBBLE' 20-60mm DIA. SOURCE FROM ALBANY ALL-SOILS LANDCAPE SUPPLIES OR SIMILAR APPROVED

INFILL DRAINAGE MESH PANELS AS SHOWN WITH FINISHED LEVELS TO ALLOW FOR MINOR SETTLING. CONTRACTOR SHALL TOP-UP AS REQUIRED PRIOR TO PC.

CONCRETE GENERAL

CONCRETE SURFACES

- CONCRETE EXPOSURE CLASSIFICATION B2 (AS3600:2018)
- REFER TO ENGIN. DRAWINGS FOR FINISHED GRADES AND LEVELS.
- LOCATION OF CONCRETE SURFACES ASSOCIATED WITH STRUCTURES OR LANDSCAPE WORKS SHALL BE CONFIRMED ONSITE BY SUPERINTENDENT AND LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.
- DIMENSIONS AND DETAILS SPECIFIC TO CONCRETE SURFACES ASSOCIATED WITH STRUCTURES SHALL BE TAKEN FROM THE APPROPRIATE DRAWINGS.
- MAXIMUM CLEARED WIDTH OF VEGETATION FOR CONCRETE SURFACES IS TO BE NO MORE THAN 200MM PAST FINISHED EDGE OF CONCRETE SURFACE UNLESS CUT OR FILL BATTERS ARE SHOWN ON DRAWINGS OR AS AGREED WITH SoD SUPERINTENDENT
- THE FINISHED CONCRETE SURFACES SHALL BE FREE DRAINING AT ALL TIMES. THE FINISHED SURFACE TOLERANCE DEVIATION FROM THE BOTTOM OF A 3 METRE STRAIGHT EDGE SHALL BE A MAXIMUM OF 10MM. REFER 'CONCRETE FINISHES' FOR DETAILS.

TYPICAL DETAILS

- CONCRETE SHALL BE FINISHED MONOLITHICALLY TO A SMOOTH, EVEN SURFACE BY MEANS OF WOOD FLOATS TO PRODUCE A SLIP RESISTANT FINISH. THERE SHALL BE **NO FRAMING** TO EDGES OR JOINTS.
- THE MATERIAL UPON WHICH CONCRETE SURFACES ARE TO BE CONSTRUCTED SHALL BE COMPACTED SUBGRADE AS SPECIFIED BY ENGINEER
- THE CONTRACTOR SHALL PROVIDE TEST RESULTS FOR THE SUB BASE TO SUPERINTENDENT PRIOR TO POURING CONCRETE.
- BLACK PLASTIC (POLYETHYLENE) MEMBRANE SHALL BE PLACED UPON LEVELLED, COMPACTED SUB BASE PRIOR TO CONCRETE POUR AND REINFORCING MESH PLACEMENT IN AREAS INDICATED ON DRAWINGS. ALL JOINTS IN MEMBRANE SHALL BE OVERLAPPED BY 300MM AND TAPED.
- TYPICAL CONCRETE REINFORCING SHALL BE SL82 MESH INSTALLED WITH PLASTIC CHAIRS TO ACHIEVE 45 COVER MIN.
- TYPICAL CONCRETE SURFACES SHALL BE POURED TO ENABLE A MINIMUM CURED THICKNESS OF 100MM AND A CURED STRENGTH OF N40.
- ALL CONCRETE AREAS SHALL HAVE AN EDGE THICKENING AS SHOWN ON DRAWINGS. (REFER DETAIL)

PLACEMENT

- ALL FORMWORK AND BLACK PLASTIC MEMBRANE SHALL BE DAMPENED (REMOVE ANY PONDING SURFACE WATER) PRIOR TO PLACING CONCRETE.
- ONCE POURED THE CONCRETE SLAB SHALL BE TREATED TO ENSURE THE CURING OF THE CONCRETE OCCURS OVER 7 DAYS. CURING SHALL BE ACHIEVED BY A CURING COMPOUND, PONDING OR MEMBRANE CURING. CURING METHOD SHALL BE APPROVED BY SUPERINTENDENT PRIOR TO CONCRETE POUR.
- GREEN CONCRETE SHALL BE PROTECTED FROM RAIN AND FLOWING WATER AT ALL TIMES.
- PROVIDE PROTECTION AS NECESSARY TO PREVENT CRACKING OF THE CONCRETE DUE TO TEMPERATURE CHANGES DURING THE CURING PERIOD.
- WHENEVER TEMPERATURES BELOW 3°C ARE FORECAST, CONCRETE SHALL BE PROTECTED FROM FROST FOR 24 HOURS AFTER PLACING BY COVERING WITH SUITABLE HEAT INSULATING MATERIAL.
- CONCRETE IS NOT TO BE POURED WHEN THE AMBIENT TEMPERATURE ON SITE IS OR IS LIKELY TO EXCEED 32° UNLESS PRECAUTIONARY MEASURES ARE TAKEN. REFER SPECIFICATION AND / OR LIAISE WITH ENGINEER IN THESE CIRCUMTANCES.

PAVING JOINTS:

CONTROL JOINTS (CJ): SAW CUT JOINTS (3MM TYP. ¼ DEPTH MIN.) LOCATED AS PER LANDSCAPE DRAWINGS.
EXPANSION JOINTS (EJ): LOCATED AS PER DRAWINGS WITH 10MM STIFF EXPANSION JOINT MATERIAL 30KG/M³, COLOUR CHARCOAL. STOP MESH AT EITHER SIDE OF EJ (100MM TYP)
FINAL LOCATIONS OF EXPANSION AND CONTROL JOINTS TO BE APPROVED ON SITE WITH SOD SUPERINTENDENT OR LANDSCAPE ARCHITECT
PROVIDE SAMPLE OF EXPANSION JOINT MATERIAL FOR APPROVAL BY SOD SUPERINTENDENT OR LANDSCAPE ARCHITECT

KERBING:

REINFORCED FLUSH KERBING (FK) IN STANDARD GREY CONCRETE; REFER ENGINEER DRAWINGS FOR LOCATIONS

WHEEL STOPS:

REINFORCED PRECAST CONCRETE WHEEL STOPS IN STANDARD GREY CONCRETE.
PRODUCT SHALL BE 'HUMES WHEELSTOP' 1650(L) X 100(H) X 170(W) - PRODUCT CODE 5531234
FILL PIN-HOLES WITH NON-SHRINK GROUT AFTER INSTALLATION. COLOUR TO MATCH WHEELSTOP; REFER DRAWINGS FOR LOCATIONS AND SETOUT.

CONCRETE FINISHES

CONCRETE PATHS - 40MPA WITH SL82 MESH 45 COVER MIN. (TYP.)

REINFORCED INSITU CONCRETE PAVING, INTEGRALLY COLOURED - CLASS 1
FINISH: MONOLITHIC FINISH USING WOOD FLOAT.
NO FRAMING TO EDGES AND JOINTS.
FINISH TO CREATE A NON-SLIP SURFACE WITH A CONSISTENT FINISH.
COLOUR: HANSON CONCRETE - *CCS* "APOLLO"

FEATURE SANDBLASTED AREAS
SANDBLASTED FINISH TO AREAS AS SHOWN.
CONTRACTOR SHALL PROVIDE STENCIL TEMPLATES TO ACHIEVE PATTERNS AS SHOWN.
MEDIUM / HEAVY SANDBLAST FINISH REQUIRED TO EXPOSE AGGREGATES OVER AREAS SHOWN.
DIGITAL FILES TO MANUFACTURE TEMPLATES SHALL BE SUPPLIED BY LANDSCAPE ARCHTIECT UPON AWARD OF TENDER.

NOTE:
1) SAMPLES SHALL BE PROVIDED FOR ALL CONCRETE FINISHES AND PRECAST COMPONENTS TO BE APPROVED BY LANDSCAPE ARCHITECT AND SUPERINTENDENT, INCLUDING SAND BLAST FINISH. PROVIDE 1m2 PANELS FOR REVIEW.
2) ALL INTEGRALLY COLOURED CONCRETE AND FINISHES INSTALLED TO MANUFACTURER'S RECOMMENDATIONS.

AS-CONSTRUCTED REQUIREMENTS

THE CONTRACTOR SHALL ARRANGE FOR ALL AS-CONSTRUCTED SURVEY OF ALL LANDSCAPE WORKS INCLUDING WALLS, CONCRETE AND BRICK PAVING, BOLLARDS AND DRAINAGE. PRESENTATION OF RESULTS USING A LICENSED SURVEYOR AT THE CONTRACTOR'S EXPENSE.
THE AS-CONSTRUCTED INFORMATION SHALL BE SIGNED AND CERTIFIED AS ACCURATE AND CORRECT BY THE CONTRACTOR AND THE LICENSED SURVEYOR BEFORE BEING SUBMITTED TO THE SUPERINTENDENT FOR APPROVAL.
THIS INFORMATION SHALL BE SUBMITTED TO THE SUPERINTENDENT PRIOR TO PRACTICAL COMPLETION AND PRIOR TO ACCEPTANCE OF THE WORKS.

REV	DESCRIPTION	DATE
RE1	TENDER	07.11.23

TENDER

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OCEAN BEACH REDEVELOPMENT - STG 1
TENDER
SPECIFICATIONS / NOTES

Designer/s:	Draftperson/s:	Engineer:
DS	DS	-
	Checked by: DG	Client Approval: -

Date:	Project Number:	Drawing:	Sheet no.
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STAGE 2.

STAGE 1.

(REFER TO ARCH PLANS FOR DEMOLITION REQUIREMENTS)

TO REMAIN

TO BE REMOVED

TO BE REMOVED (BY OTHERS)

01 - **SITE PLAN** EXISTING / DEMO

1:1000 (A1)

N 1:500

0 5 10 20 30 40 50m

EXTENT OF WORKS - STAGE 1

EXISTING CARPARK

EXTENT OF WORKS

EXISTING ASPHALT PATH NARROWS TO 2400mm

EXISTING ASPHALT PATH TRIM AND CONNECT TO PROPOSED CONCRETE & MAKE GOOD

CUT ASPHALT AND REMOVE TO ALLOW FOR CONCRETE SURFACE. INSTALL THICKENING AS PER STANDARD DETAIL

REMOVE ASPHALT & EXISTING SIGNAGE

BIKE RACKS. REFER DETAIL (FUTURE STAGE 2 WORKS)

LIMESTONE BLOCK RETAINING WALLS. (REFER ENGIN. DRAWINGS FOR DETAILS)

NEW ACCESS STAIRS AND LOOKOUT. (FUTURE WORKS NOT PART OF THIS CONTRACT)

OUTDOOR SHOWERS (REFER DETAILS) ENSURE FALL WEST TO DRAIN

AREA REQUIRING CUT TO SUIT 1m HIGH RET WALL (REFER ENGIN PLANS FOR EXACT EXTENTS)

NEW PUBLIC AMENITIES WITH KIOSK. (REFER ARCH. DRAWINGS)

LIMESTONE BLOCK RETAINING WALL WITH DRAIN AT BASE. REFER ENGIN DETAILS

EXTENT OF CONCRETE WORKS. BOLLARDS ONLY BEYOND THIS POINT. REFER CIVIL DRAWINGS

DSLSC STORAGE

SURFCLUB BUILDING TO REMAIN. (REFER ARCH. DRAWINGS)

REMOVE EXIST. CONCRETE APRON AND INSTALL BRICK PAVING AS SHOWN. RE-USE EXISTING PAVERS FROM PATROL BUILDING (APPROX. 88m2 AVAILABLE - NEED 120m2 AS SHOWN. REFER NOTES)

SANDBLASTED INLAYS. REFER NOTES FOR DETAILS

TEMPORARY CONNECTION TO DSLSC & BEACH POST STAGE WORK BY SHIRE OF DENMARK

EXIST. SEPTICS AND LEACH DRAINS (TO BE RELOC.)

NEW SEPTICS AND LEACH DRAINS (REFER HYD. DRAWINGS)

PUBLIC REALM UPPER TERRACE WITH CONCRETE SURFACE AND LAWN

EXISTING TOILETS TO BE REMOVED (BY OTHERS)

SEALED UNIVERSAL ACCESS PARKING & SURFCLUB STORAGE ACCESS (REFER ENG. DRAWINGS)

SITE ACCESS FOR CONSTRUCTION

BEACH ACCESS GRAVEL ROAD

TIMBER BEACH ACCESS STAIRS (NORTH)

FILL AND REHAB. DUNE AREA. TIE INTO EXIST SLOPE

INSTALL DUTE MATTING TO STABILISE BATTER

LIMESTONE BLOCK STAIRS

EXISTING TIMBER RETAINING (TO REMAIN)

EXISTING LAWN (TO REMAIN)

LIMESTONE BLOCK RETAINING WALLS

PROMENADE WALK (COMPACTED LIMESTONE)

PATROL BUILDING TO BE REMOVED (BY OTHERS)

LAWN GARDEN LAWN

LANDSCAPE TERRACE AREA

EXISTING SEAWALL TO BE REMOVED (BY OTHERS)

NEW SEAWALL WITH ROCK REVETMENT IN FRONT (BY OTHERS)

LIMESTONE BLOCK STAIRS

TIMBER BEACH VIEWING DECK WITH SEATING

TIMBER BEACH ACCESS STAIRS (SOUTH)

EXTENT OF WORKS - STAGE 2

BEACH NOURISHMENT AREA

UNIVERSAL ACCESS BEACH CARPARK. (FUTURE WORKS. NOT PART OF THIS CONTRACT)

EXTENT OF WORKS (LANDSCAPE) - STAGE 1

EXTENT OF WORKS (LANDSCAPE) - STAGE 2

02 - **SITE PLAN** OVERVIEW / EXTENT OF WORKS - STAGE 1

1:250 (A1)

N 1:250

0 5 10 15 20 25m

REV	DESCRIPTION	DATE
REV 1	TENDER	07.11.23

TENDER

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OCEAN BEACH REDEVELOPMENT - STG 1

TENDER

SITE PLAN - LANDSCAPE

Date:	Project Number:	Drawing:	Sheet no.
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EXTENT OF WORKS

EXISTING ASPHALT PATH NARROWS TO 2400mm

EXISTING ASPHALT PATH TRIM AND CONNECT TO PROPOSED CONCRETE & MAKE GOOD

REMOVE ASPHALT & EXISTING SIGNAGE

CUT ASPHALT AND REMOVE TO ALLOW FOR CONCRETE SURFACE. INSTALL THICKENING AS PER STANDARD DETAIL

BIKE RACKS. REFER DETAIL (FUTURE STAGE 2 WORKS)

LIMESTONE BLOCK RETAINING WALLS. (REFER ENGIN. DRAWINGS FOR DETAILS)

RW1

FUTURE WORKS

D08

300W DRAIN AT BASE OF WALL. SEE ENG. DETAILS.

TOWEL RAIL (BY OTHERS)

OUTDOOR SHOWERS (REFER DETAILS) ENSURE FALL WEST TO DRAIN

NEW ACCESS STAIRS AND LOOKOUT. (FUTURE WORKS. NOT PART OF THIS CONTRACT)

600W DRAINAGE AT BASE OF WALL. (REFER ENGIN. DETAIL)

AREA REQUIRING CUT TO SUIT 1m HIGH RET WALL (REFER ENGIN PLANS FOR EXACT EXTENTS)

NEW PUBLIC AMENITIES WITH KIOSK. (REFER ARCH. DRAWINGS)

LIMESTONE BLOCK RETAINING WALL WITH DRAIN AT BASE. REFER ENGIN DETAILS

TOW 8.150

CONCRETE SURFACE (REFER DETAILS & NOTES FOR FINISH)

+FFL 7.15

KIOSK / PUBLIC AMENITIES REFER ARCH. DRAWINGS

PROVIDE RE-ENTRANT BARS TO ALL RE-ENTRANT CORNERS (TYP.). BARS TO BE 1500 LONG N16 TIED TO U'SIDE OF MESH

PROVIDE ISOLATION JOINT BETWEEN CONC. PATHS AND STRUCTURES (TYP.) ISOLATION JOINT TO BE SIMILAR TO EJ. DETAIL

STAGE 1 WORKS

STAGE 2 WORKS

BACKFILL THIS AREA BEHIND NEW RETAINING WALLS WITH CLEAN TOPSOIL FROM SITE. FINISH 100mm BELOW TOP OF WALL (TYP.) GRADE BACK AND CONNECT TO EXISTING.

CUT AND REMOVE EXISTING ASPHALT & MAKE GOOD CONNECTION TO EXISTING GL. INSTALL EDGE THK AS PER DETAIL

SANDBLASTED INLAYS. REFER NOTES FOR DETAILS

NEW SEPTICS AND LEACH DRAINS (REFER HYD. DRAWINGS)

POTENTIAL NEW SEPTICS & LEACH DRAIN LOC. (TBC)

EXTENT OF CONCRETE WORKS. BOLLARDS ONLY BEYOND THIS POINT. REFER CIVIL DRAWINGS

TIMBER BOLLARDS (REFER DETAIL)

PROVIDE RE-ENTRANT BARS TO ALL RE-ENTRANT CORNERS (TYP.). BARS TO BE 1500 LONG N16 TIED TO U'SIDE OF MESH

REMOVABLE BOLLARDS (REFER NOTES)

ASPHALT CARPARK (REFER ENGIN. DWG FOR DETAILS)

DSLC STORAGE

DSLSC STORAGE

ACCESS TO LOWER CARPARK (FUTURE WORKS)

FLUSH KERB (FK) 300w Reinforced

EXTENT OF WALL TBC

EXIST GRAVEL ACCESS ROAD

LIMESTONE BLOCK RETAINING WALL. REFER ENGIN DETAILS.

STONE MULCH AROUND BUILDING

SITE ACCESS FOR CONSTRUCTION

TEMPORARY CONNECTION TO DSLSC & BEACH POST STAGE WORK BY SHIRE OF DENMARK

STAGE 2 WORK - NOT PART OF THIS CONTRACT

EDGE THK TO RETAINING EDGE. REFER DETAIL

EDGE THK EXTEND AROUND SEAT

TIMBER SEAT (ST1) REFER DETAIL

CONCRETE SURFACE (REFER DETAILS & NOTES FOR FINISH)

EDGE THK (REFER TYP. DETAIL)

STRIP DRAIN. REFER DETAIL

SHAPE SURFACE TO DIRECT WATER TO ROCK DRAIN

EXIST. SEPTICS AND LEACH DRAINS (TO BE RELOC.)

DRAINAGE SLOTS IN KERB WALL (REFER DETAIL)

PUBLIC REALM UPPER TERRACE WITH CONCRETE SURFACE AND LAWN

EXIST LEACH DRAINS TO BE

EDGE THK. (REFER TYP. DETAIL)

SEALED UNIVERSAL ACCESS PARKING & SURFCLUB STORAGE ACCESS (REFER ENG. DRAWINGS)

EDGE THK (300mm TYP.) BOLLARD SHARED ZONE (REFER DETAIL)

TOW 8.150

CONCRETE JOINTS

EJ. (EXPANSION JOINT) 10mm TYP REFER SPECS.

CJ (CONTROL JOINT) 3mm GRINDER CUT 40mm DEEP

03 - PLAN — CONCRETE WORKS & RETAINING WALLS
1:100 (A1)

1:100
0 1 2 3 4 5 10m

REMOVE EXIST. CONCRETE APRON AND INSTALL BRICK PAVING AS SHOWN. RE-USE EXISTING PAVERS FROM PATROL BUILDING (APPROX. 88m2 AVAILABLE - NEED 120m2 AS SHOWN. REFER NOTES)

LAWN

04 - PLAN — PAVING AROUND DSLSC
1:100 (A1)

REV	DESCRIPTION	DATE
REV 1	TENDER	07.11.23

TENDER

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Designer/s:	Draftperson/s:	Engineer:
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	Checked by: DG	Client Approval: -

Date:	Project Number:	Drawing:	Sheet no.
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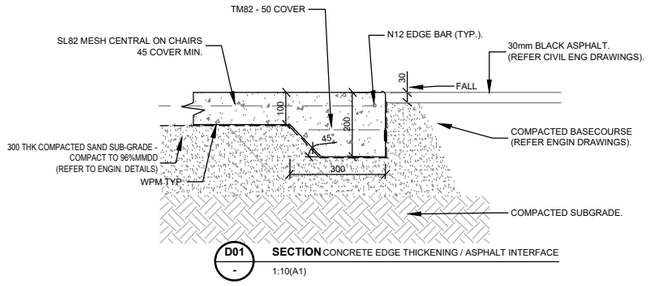
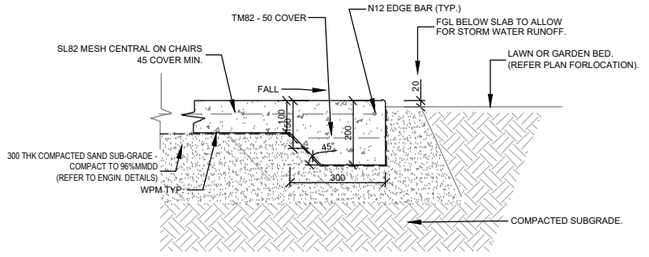
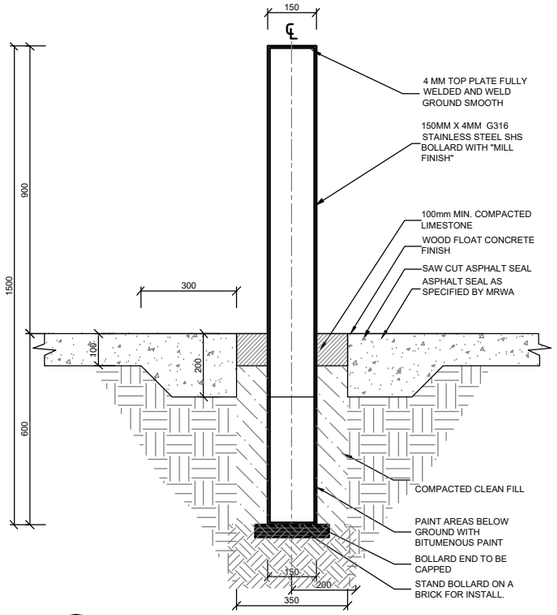
OCEAN BEACH REDEVELOPMENT - STG 1
TENDER
CONCRETE WORKS - EXTERNAL



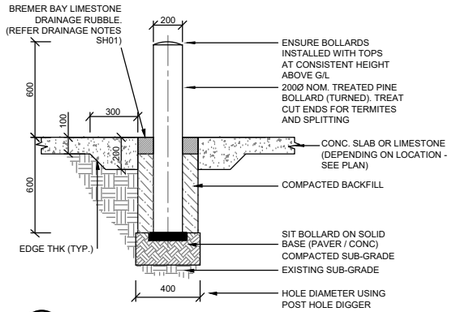
D01 - SECTION CONCRETE EDGE THICKENING / ASPHALT INTERFACE
1:10(A1)



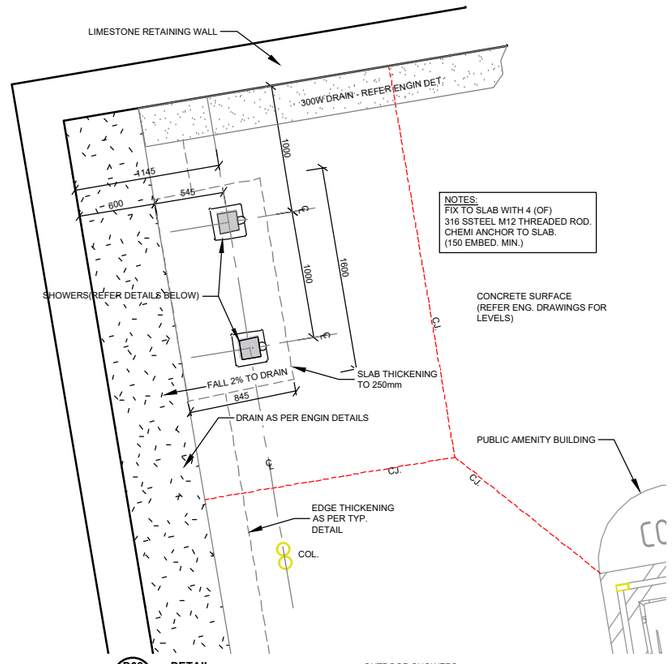
D02 - SECTION CONC. EDGE THK - LAWN / GARDEN INTERFACE
1:10(A1)



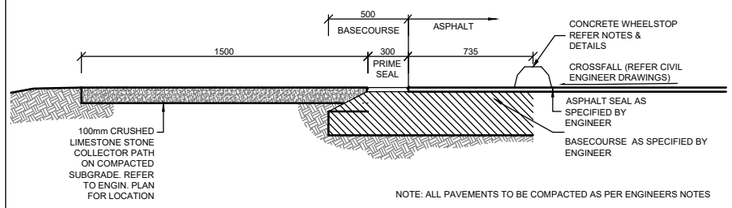
D04 - DETAIL BOLLARD - UNIV ACCESS BAY
1:10(A1)



D05 - DETAIL BOLLARD - STANDARD TIMBER
1:20(A1)

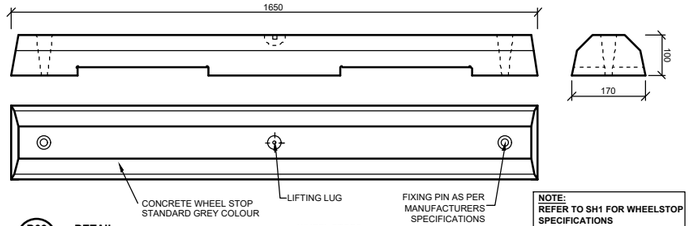


D08 - DETAIL OUTDOOR SHOWERS
1:25(A1)



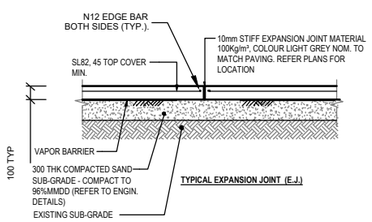
NOTE: ALL PAVEMENTS TO BE COMPACTED AS PER ENGINEERS NOTES

D03 - SECTION CONCRETE FLUSH KERB (FK)
1:20(A1)

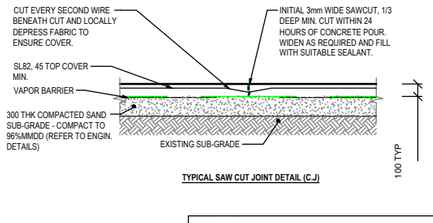


NOTE:
REFER TO SH1 FOR WHEELSTOP SPECIFICATIONS

D06 - DETAIL WHEEL STOPS
1:10(A1)



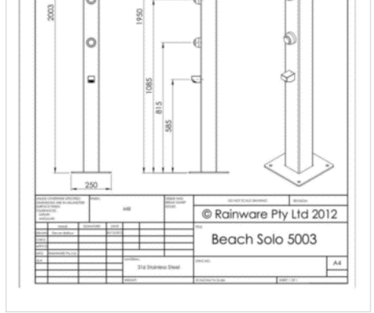
TYPICAL EXPANSION JOINT (E.J.)



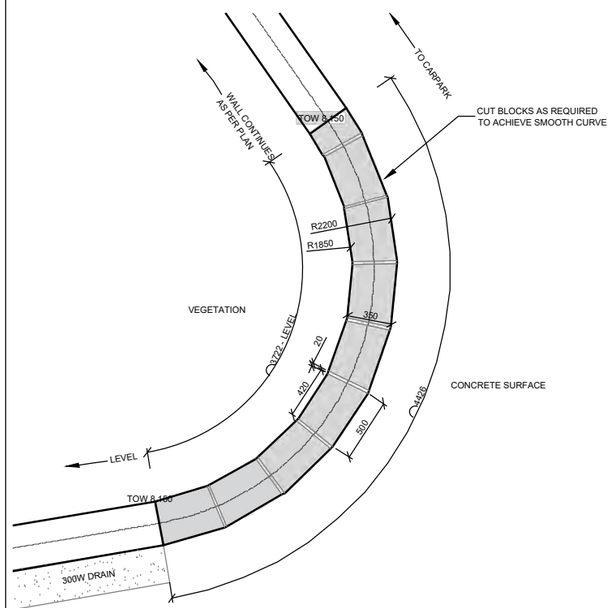
TYPICAL SAW CUT JOINT DETAIL (C.J)

D07 - DETAIL CONCRETE PAVING / JOINTS
1:25(A1)

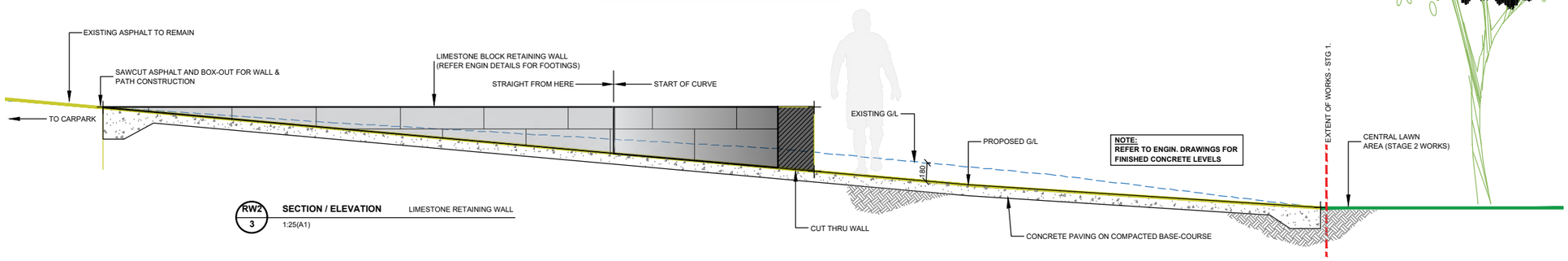
NOTES
1. PROTECT JOINT FROM DIRT& DEBRIS INGRESS WITH TAPE OR SIMILAR AFTER POURING CONCRETE, PRIOR TO SEALING.
2.DELAY SEALING JOINTS FOR AS LONG AS POSSIBLE FOLLOWING CASTING OF THE SLAB.
3. ALTERNATIVE JOINT SEALANTS ARE TO BE SUBMITTED FOR REVIEW AND APPROVAL. COLOUR TBC WITH SUPERINTENDENT.



D09 - ELEVATION OUTDOOR SHOWERS
1:20(A1)



RW1 3 - PLAN LIMESTONE RETAINING WALL - CURVED
1:25(A1)



NOTE:
REFER TO ENGIN. DRAWINGS FOR FINISHED CONCRETE LEVELS

RW2 3 - SECTION / ELEVATION LIMESTONE RETAINING WALL
1:25(A1)

REV	DESCRIPTION	DATE
REV 1	TENDER	07.11.23

TENDER

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DS	DS	-
	Checked by: DG	Client Approval: -

OCEAN BEACH REDEVELOPMENT - STG 1
TENDER
DETAILS

Date:	Project Number:	Drawing:	Sheet no.
NOV 2023	23-01	LA-04	4 of 4

NOTE: 3D VIEWS ARE ARTISTS IMPRESSIONS AND MAY NOT ACCURATELY REFLECT DETAILED DESIGN

CONCEPT 3D VIEWS
2301 Ocean Beach Redevelopment
Ocean Beach, Denmark, WA 6333

3D.01	rev
07/11/2023	B

PTX ARCHITECTS

NOTE: 3D VIEWS ARE ARTISTS IMPRESSIONS AND MAY NOT ACCURATELY REFLECT DETAILED DESIGN

CONCEPT 3D VIEWS
2301 Ocean Beach Redevelopment
Ocean Beach, Denmark, WA 6333

3D.02	rev
07/11/2023	B

PTX ARCHITECTS

NOTE: 3D VIEWS ARE ARTISTS IMPRESSIONS AND MAY NOT ACCURATELY REFLECT DETAILED DESIGN

DRUM landscape architecture

CONCEPT 3D VIEWS
2301 Ocean Beach Redevelopment
Ocean Beach, Denmark, WA 6333

3D.03	rev
07/11/2023	B

PTX ARCHITECTS

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