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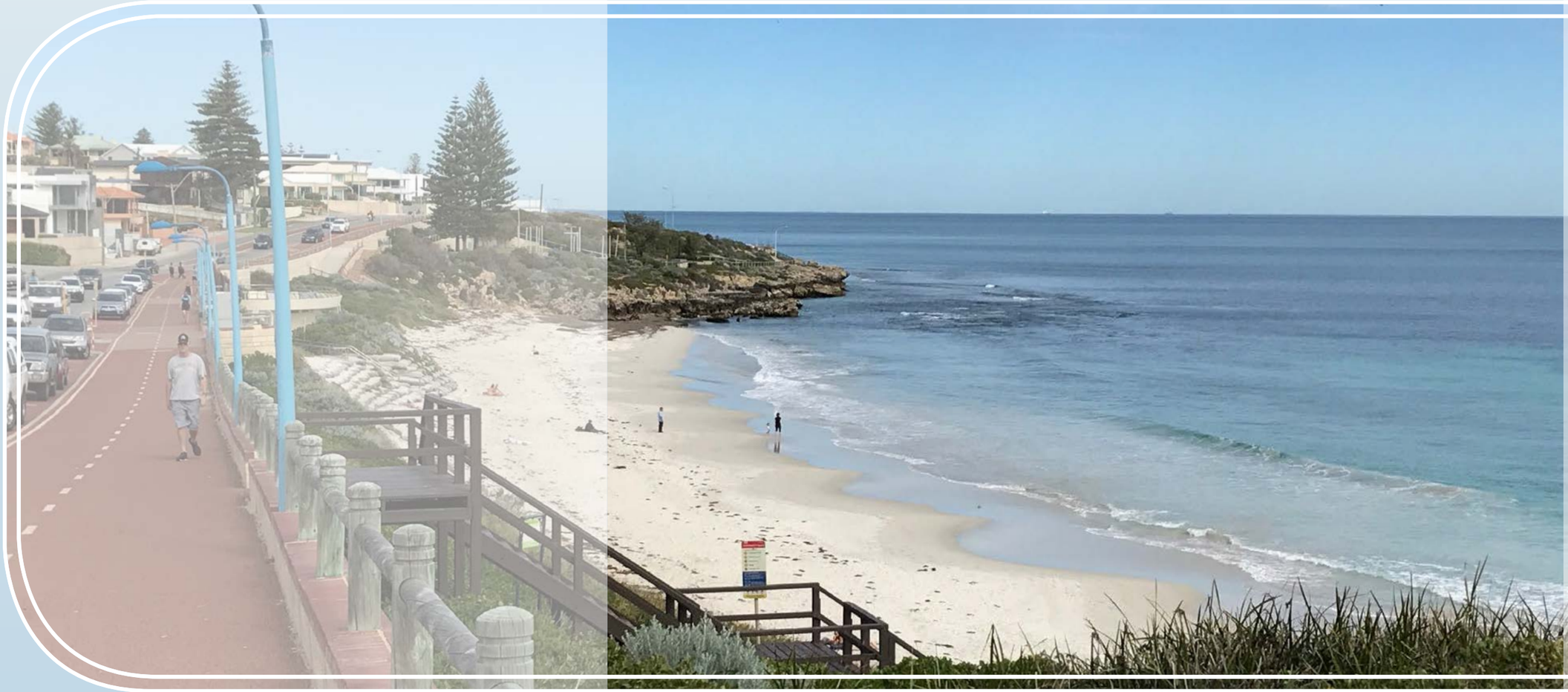

Perth Coastal Recreational Use Study

Study funded by

Department of Local Government, Sport and Cultural Industries

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Perth Coastal Recreational Use Study

October 2018

Authors

Dr Isaac Middle, Professor Marian Tye and Dr Garry Middle

EXECUTIVE SUMMARY

This report provides a baseline understanding of recreational use of the Perth coastline, specifically between the study area stretching north to Two Rocks and south to Singleton. The report's main output is a series of 28 hard copy maps that collectively show the recreational infrastructure, uses and classification of the study area.

Part A of the report begins with the background to the study. This background firstly identifies the significance of the study in filling the gap of an overarching approach towards the planning and management of coastal recreation use in Perth, across Local and State Government and other relevant coastal stakeholders. Terminology for understanding the coast from a recreational use perspective is then established, with a range of variables identified that distinguish different uses:

- The *purpose* or underlying motivation for undertaking recreation.
- The *location* where recreation occurs (i.e. water, beach, park, path, dune or indoors);
- The level of physical *exertion* required (i.e. passive, moderate or intense);
- Whether any piece of *equipment* or associated set of skills is required (i.e. general or specialist);
- Whether *payment* is required (i.e. free or commercial);
- Whether there are any intangible *experiences* related to the recreation (i.e. education, aesthetic, nature, wilderness).

To understand the occurrence of these uses along the study area, the study developed and applied an audit of the coastline that mapped specific recreational infrastructure related to specific uses and, where possible, the location of uses themselves. This was achieved through an action research approach that comprised five largely sequential stages, outlined in more detail on page 10:

1. A *Desktop Study* that informed the scope of the study and the initial composition of the audit tool.
2. Comprehensive *Site Visits* consisting of photography and opportunistic observations.
3. *Desktop Mapping* of the location of these infrastructure and uses in spatial geocoded format.
4. Extensive *Consultation and Verification* of these maps with relevant local governments, state government departments and state sporting associations.
5. *Analysis* of these maps and subsequent *Classification* of the coast based on a coastal recreational use framework.

The final Coastal Recreational Use Audit Tool applied in the study is shown on page 11. It includes all coastal paths, including shared-use (pedestrians and cyclists) and walking paths, with beach access paths also mapped but not shown on the final hard copy maps. It brings together a comprehensive list of recreational infrastructure, grouped into categories that can be used as general proxies for different recreational uses. Further, it also identifies the specific locations of different specialist water-based uses, and maps discrete areas designated for other recreational uses.

While the complete findings of the application of this audit are found in **Part B** of the report, the distribution of individual groupings of recreational infrastructure and uses are also displayed and discussed from page 13 onwards. This includes:

- The extent of the coastal shared path network and associated infrastructure;
- The recreational experiences provided by coastal shared and walking paths;
- Proxies for general water-based use, mainly the presence of surf lifesaving infrastructure and patrolled areas;
- Universal beach access locations;
- The distribution of specialist water-based use, with a focus on conventional and kite/wind surfing locations;
- Infrastructure and designated marine areas associated with boating recreation;
- The location of dog and horse exercise areas.

Based on the overall patterns in the provision of recreational infrastructure and the occurrence of recreational uses uncovered through the audit, a Coastal Recreational Use Classification Framework was determined. This Framework classified the extent of the study area into two types of locations:

- Nodes: largely developed areas within a foreshore reserve that have a variety of infrastructure and typically act as destinations for a variety of recreational uses.
- Connectors: largely undeveloped areas that act mainly as links between nodes, typically through the provision of a shared path with supporting infrastructure.

The full classification framework is outlined on pages 22 and 23, and identifies seven types of nodes, five of which are predominantly recreational:

- **Beach access nodes** – provide for only beach and water-based uses;
- **Minor activity nodes** – provide additional park-based active and passive uses, with greater capacity for specialist water-based use;
- **Moderate activity nodes** – provide a greater variety of park-based recreation, including commercial and indoor uses, however may restrict specialist water-based uses.
- **Major activity nodes** – provide more extensive commercial opportunities and are typically used for tourism purposes.
- **Boat harbour nodes** – facilitate many specialist water-based (boating) uses, however can restrict many water, beach and park uses.

Three types of connectors are also identified, with each again distinguished based on the general types of recreational infrastructure and uses:

- **Wild connectors** – have limited beach and water-based recreation, however may provide unique aesthetic, nature and wilderness experiences.
- **Dune path connectors** – permit greater access to the beach and typically contain shared paths and supporting infrastructure that facilitate a range of additional recreational uses along with enhanced aesthetic and educational experiences.
- **Urban connectors** – have enhanced water and beach and path-based uses, however have negligible nature and wilderness experiences.

Pages 24 to 33 give illustrated examples of each type of node and connector and its pattern of distribution across the study area. Following this on pages 34 and 35 is a map showing the full distribution of each node and connector across the study area.

Part A of the report concludes on page 36 wtih: a reiteration of the significance of the report as a starting point for a holistic understanding of the recreational use of the coast for all stakeholders; a discussion of planning and management issues that emerged during the study process; and a series of future considerations for providing a more comprehensive understanding of recreational use across the entire state of Western Australia.

Part B of the report sets out in detail the results of the Coastal Recreational Use Audit – including all spatially geocoded coastal recreation infrastructure, use locations and designated use areas – along with the categories of the Coastal Recreational Use Classification Framework. These results are broken into 28 separate maps, each including a description of the specifics of the area and supporting photography.

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- City of Wanneroo;
- City of Joondalup;
- City of Stirling;
- Town of Cambridge;
- City of Nedlands;
- Town of Cottesloe;
- City of Fremantle;
- City of Cockburn;
- Town of Kwinana;
- City of Rockingham.

State Government Departments/Agencies:

- Department of Local Government, Sport and Cultural Industries;
- Department of Biodiversity, Conservation and Attractions;
- Department of Transport;
- Western Australian Planning Commission.

State Sporting Organisations:

- Surf Life Saving WA;
- Surfing WA;
- Recfishwest;
- WA Kite Surfing Association;
- Volleyball WA;
- WA Ultimate (Flying Disc Association).

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- Andrew Liddawi
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- Drew Norton
  WA Kite Surfing Association
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  Surfing WA
- Leyland Campbell
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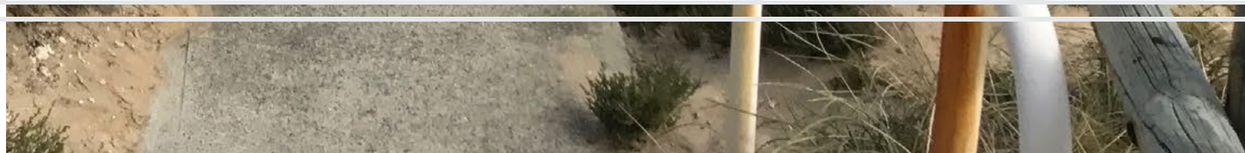


PART A

Introduction

The coastline of Perth is unquestionably one of the City's most valuable recreational assets: playing a major role in the enviable lifestyles of many residents, and a significant tourist attraction for visitors. However, forces such as encroaching residential and commercial development, climate change (coastal erosion) and environmental conservation are individually and collectively placing increasing pressure on the recreational use of this coastline. While several coastal planning documents exist, there is currently no single document dedicated to informing understanding and management of the recreational uses of the coastline within the context of the aforementioned forces. This document aims to address that gap.

The purpose of the project underpinning this report has been to provide a baseline understanding of recreational use of the Perth coastline – drawing on existing information regarding coastal planning, site visits to determine location of existing and proposed infrastructure, and extensive consultation with coastal recreation stakeholders. This report contains maps and information that should be a valuable reference for discussion and decision making by coastal planners and managers generally, and recreation planners and stakeholders specifically.

The geographic extent of the study – the study area as shown in Figure 1 – is the coast and near shore marine areas within the metropolitan region as defined in the Western Australian Planning Commission's (WAPC) Metropolitan Region Scheme. More specifically, this includes:

- The existing and proposed foreshore reserves vested in the relevant local governments;
- Coastal Conservation Reserves vested and managed by Department of Biodiversity, Conservation and Attractions (DBCA); and
- The near-shore marine areas – defined as the extent of the marine area subject to human uses where those uses are accessed by the adjacent beach.

The two key estuaries in the study area were thus excluded – Peel-Harvey and Swan-Canning.

This report identifies and maps the existing recreational use of this study area. It was compiled using an iterative and responsive action research approach. This approach commenced with a desktop review of existing coastal usage and management information, as provided by the Department of Local Government, Sport and Cultural Industries (DLGSC), followed by physical site visits and photography along the study area, and finally extensive consultation with relevant coastal planning, management and peak recreation user group stakeholders.

The first stage of the approach was the creation of a Coastal Recreational Use Audit Tool that comprised a near-exhaustive list of coastal recreational infrastructure and principal uses. This audit was then applied from north to south along the study area, with the location of key recreational infrastructure and uses identified, digitised and spatially geocoded using the software ArcGIS. This data collection process informed the development of a Coastal Recreational Use Classification Framework, comprising 'nodes' and 'connectors' that took into account the provision of recreational infrastructure, type and extent of recreational uses and experiences, and to a lesser extent its catchment area (i.e. local, district, and regional).

The main output of this report is a series of hard copy maps that represent an early 2018 baseline of the Perth coastline, from a recreational use perspective. Compiled from the audit and classification framework information, the maps include the location of key recreational infrastructure and uses, along with all nodes and connectors.

This report is structured in two parts, Part A and Part B, as follows:

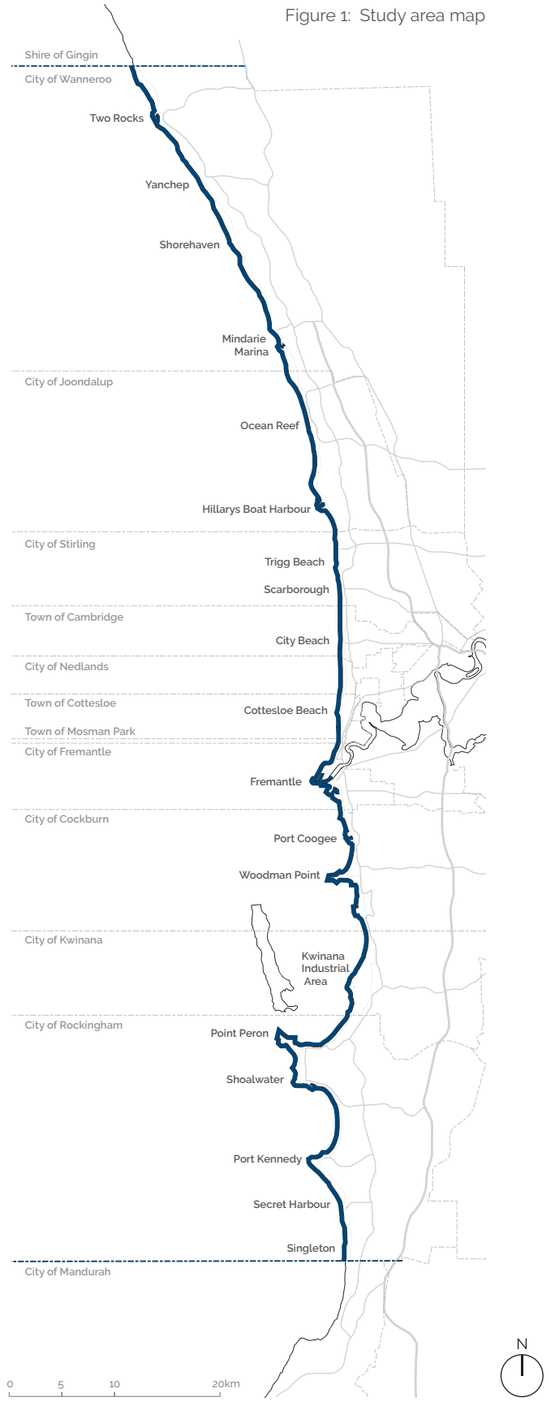
Part A

- Background: An overview of the significance of the study and the policy context in which it is situated, with definition and explanation of key concepts.
- Methodology: A summary of the research approach and methods.
- Coastal Recreational Use Audit Tool: The full list of criteria comprising the audit tool.
- Audit Application: Key findings from the application of the audit tool presented as maps and accompanying discussion.
- Coastal Recreational Use Classification Framework: The framework that emerged from the audit, detailed illustrated examples for each classification type, and the overall distribution of each classification type along the study area.
- Discussion and Future Directions: Reflections on the significance of the study for future planning for coastal recreational use, a discussion of the key issues that emerged from the audit and classification process, and identification of areas for future work.

Part B

- A resource comprising a series of 28 maps that detail the recreational infrastructure, uses and classifications of the study area from north to south.

Figure 1: Study area map



Background

Planning Context

The coastline of Western Australia (WA) is, for the most part, in public, not private, ownership – ensuring it is easily accessible to the whole community for a range of largely recreational purposes. Coastal areas are generally zoned as 'Reserves', which encapsulate the beach and rocky coastal features and the adjacent terrestrial foreshore of varying width, and are vested in local governments. Exceptions to this vesting include where the coast has special conservation and heritage values – where it is typically included in a Regional Park and jointly managed by the local government and the Department of Biodiversity, Conservation and Attractions (DBCA) – e.g. Woodman Point.

Responsibility for coastal planning and management lies across a variety of agencies and stakeholder groups. At a state level, responsibility has been with the Planning portfolio since 1986, and was strengthened in the early 2000s following a report from a taskforce specifically set up to review coastal governance arrangements (Ministerial Taskforce investigating Structural Arrangements for Coastal Planning and Management in Western Australia 2002), and the subsequent government response (Department of Planning and Infrastructure 2003). Both the Department of Transport and Department of Fisheries hold some specific responsibility for the near shore marine areas – including some monitoring, licencing of certain structure and activities, and provision of technical advice – while the DBCA has responsibility for Regional and Marine Parks. Further, local governments bear much responsibility for the day-to-day maintenance and management of these Reserves, including bookings for organised community and commercial uses and approvals of new infrastructure.

These responsible agencies must consider the needs of everyday users, as well as those of peak user groups that are represented by state sporting associations. It is in this context that a holistic approach to the planning of coastal areas for recreation is required, which brings together the perspectives of each of these stakeholder groups.

Policy Context

There are two important policies that guide the planning and on-going use and management of the coast: the Western Australian Planning Commission's *State Planning Policy (SPP) 2.6* (Western Australian Government 2013) and the recently released *WA Coastal Zone Strategy* (Government of Western Australia 2017).

SPP 2.6 is primarily concerned with maintaining the numerous functions and values of the WA coast, including:

- Providing guidance for land use change decision making in regards to development for recreational, residential, industrial and commercial uses;
- Balancing the provision of adequate public access to foreshore reserves with the need to conserve ecological, indigenous and other cultural values; and
- Taking into account coastal processes relating to landform and climate change, including coastal hazard risk management and adaptation planning (CHRMAP).

The *WA Coastal Zone Strategy* takes a similar approach, setting out in more detail the list of threats and pressures that are impacting existing coastal values, and the roles of respective stakeholders in managing these values for the long-term benefit of the community and visitors.

These two policies (*SPP 2.6* and the *WA Coastal Zone Strategy*) set the broad decision making framework for the coast. While they deal in general terms with the need for public access to the coast, they provide no specific planning guidance or framework in regards to recreational use.

An additional state planning document with relevance to this study, albeit not released publically, was the 2008 *Draft Perth Coastal Planning Strategy*. The Strategy proposed 56 individual precincts to be subject to more detailed coastal planning. These precincts " … are intended to represent a walkable area with an identifiable character that sets it apart from its surroundings and adjacent areas." (WAPC 2008, p. ix). Whilst each precinct has an identifiable character, the Strategy grouped them in to one of three broad precinct types based on the dominant land use: industrial, built-up or open space with further sub-categories. This classification was based primarily on broad character of the built form and type of adjacent land uses. While appropriate for its intended purpose, the Strategy does not necessarily reflect the recreational infrastructure and use of the study area. It did however represent a useful resource for the current study, including the need for an overarching classification framework for understanding recreational use of the coast.

In a policy context, most relevant to this study are the various local government coastal planning and management policies, many of which attempt in varying degrees of detail to understand and map the different recreational uses of their respective stretches of coastline. This report builds and expands upon this work, most notably the maps found in the 2012 *City of Wanneroo Coastal Management Plan*, by comprehensively and consistently mapping recreational use along the entire study area.

Finally, it should also be noted that there are various stakeholder advisory groups that exist for consulting on different aspects of coastal planning and management. Most notably, this includes the Coastal Management Advisory Group, an interagency working group led by the Department of Planning, Lands and Heritage. The group oversees a whole of government approach to the provision of integrated advice on the management of coastal erosion and inundation consistent with *State Planning Policy No. 2.6: State Coastal Planning Polic*y. It is hoped that this report and its outputs can be used by these stakeholder groups to assist in decision making related to, or having impact on, recreational use of the Perth coast.

Understanding the Coast from a Recreational Use Perspective

In summarising the relevant coastal planning policies in Perth, it is clear that a range of different terms is used to describe and understand the importance of coastal areas. Common planning terms are: *values*, *functions, processes* and *use*.

The term 'values' is commonly applied in a coastal and natural resource management setting, typically focusing on the range of values that people can assign to the coast – i.e. assigned values. 'Assigned values' relate to perceptions of significance by individuals or by groups, and under a 'triple bottom line' approach usually include social, environmental and economic values (Middle et al. 2017). This report does acknowledge that coastal values are an important part of coastal planning and decision-making in Perth, and further that many values that people assign to the coast are closely linked if not inseparable to recreation. However, it also acknowledges the somewhat technical and potentially confusing nature of the term 'value', which is often understood from a purely economic perspective.

A related and more straightforward term that has also been applied to understand the importance of coastal areas is 'functions'. Functions describe what the coast actually *does*, and in a planning context can also be classified under the three pillars of social, economic and environmental. Not all functions have relevance to recreation. For example, coastal areas might function in an economic sense, such as in increasing property prices, simply due to their proximity to residential areas. In an environmental sense, natural areas including those along the coast can deliver a range of functions because of their natural processes: for example, carbon cycling and nutrient trapping. In the context of this report, focus is on those functions of the coast that involve humans physically visiting, interacting with and using the coast. Such usage is largely but not exclusively for recreational purposes – other examples include economic purposes such as commerce, or resource extraction, or environmental purposes such as dune restoration.

This report thus adopts the more straightforward term 'use' to represent the different recreational activities that can be undertaken at the coast. In order to establish a framework for understanding these uses, this report identifies a range of different variables by which a recreational use can be distinguished, including:

Purpose: Acknowledges that there are general underlying motivations for undertaking recreation. A typical but non-exhaustive list might include the following, with multiple examples often underlying a single visit: *swimming*, *relaxing*, *exercising* (individual and/or animal), *playing*, *socialising*, *dining*, *entertainment*, *tourism*.

Location: While the majority of visits to the coast would be assumed to involve use of the *water* and *beach*, adjacent *parkland*, *pathways* and *indoor* buildings offer complementary and sometimes primary destinations for visitors. In some coastal areas, use of the *dune* area is also permitted.

Exertion: Recreational activities are typically classified as either *passive* (e.g. sitting, sunbaking) or *active*, with active being either *moderate* (e.g. walking, playing, general swimming) or *intense* (jogging, cycling, group fitness).

Equipment: As opposed to *general* use, there are also many *specialist* coastal uses that require specific pieces of equipment with associated skill sets (e.g. surfing/boarding activities, fishing, boating, snorkelling/diving).

Payment: While most activities at the beach are *free*, certain *commercial* activities require payment at venues (e.g. cafes, shopping centres) or to mobile operators (e.g. instructors).

Experiences: These are more intangible and typically secondary outcomes of visits to the coast, and are often related to specific locations or attractions. Examples include:

- *Education*: Gaining a greater knowledge of environmental and cultural values;
- *Aesthetic*: Appreciation of the visual beauty of the site, including elements of natural and built landscape;
- *Nature*: Reverence for, and connections to, nature and landscape, and the therapeutic benefits of those experiences; and
- *Wilderness*: As above, but specific to those natural areas that are largely undisturbed and have low human visitation rates.

How these variables (purpose, location, exertion, equipment, payment and experiences) intersect, determines how different types of recreational uses play out along the coast.

Methodology

This study sought to map the coast based on indicators of recreational use. To a large extent, the occurrence of specific uses is closely related to the physical form of the coast, including the provision of specific sets of infrastructure. The main method adopted in the study was thus the development and application of an audit of the coastline that identified and mapped recreational infrastructure and, where possible, specific recreational uses. The audit findings were then interpreted to gain a broader picture and understanding of the recreational use of the coast.

An action research approach was adopted comprising five key stages that can be understood to be largely sequential, with some overlap due to the iterative and responsive nature of the research approach. They include:

1. Desktop Study;
2. Site Visits;
3. Desktop Mapping;
4. Consultation and Verification;
5. Analysis and Classification.

Such a multi-stage approach was required to address a limitation that emerged from the timing of the commission of the study, which resulted in the majority of the site visits being undertaken during non-peak periods of use between August and September 2017. While this did not affect the accuracy of identifying recreational infrastructure, which is almost entirely fixed, it did impact the extent of observations of activity along the entire coast. The subsequent extensive 2018 stakeholder consultation phase – including relevant local governments, State Government departments and state sporting organisations – somewhat made up for this limitation, as together these stakeholders were able to provide a detailed picture of the recreational use of the coastline not possible solely through opportunistic observations. Nonetheless, it is suggested that these five stages represent a template for any similar future research on recreational use of coastal areas or other natural assets.

1. Desktop Study

This study commenced with a desktop review of existing coastal usage and management information. This was complemented by initial consultation with relevant coastal planning and management stakeholders and other opportunistic engagements – most notably a facilitated workshop at the 2017 WA State Natural Resource Management (NRM) and Coastal Conference , which assisted in identifying the full range of considerations relevant to coastal planning and management in WA. This process informed the background and scope of the report, and also assisted in the creation of an initial coastal recreational use audit tool that identified a list of coastal recreational infrastructure and uses.

2. Site Visits

The second stage of the study comprised comprehensive site visits from north to south along the study area. Data collected from these visits consisted mainly of photographs of every individual recreational infrastructure included in the initial audit tool. Opportunistic observations of recreational activity, along with signage that indicated specific designated uses at specific locations, assisted in identifying recreational uses itemised in the audit tool.

3. Desktop Mapping

As a result of the site visits, a wealth of photographic and observational data was collected for the study area, and the audit tool fine-tuned. The data gained through this combined approach then enabled a process of comprehensive desktop mapping of the recreational infrastructure and uses of the Perth coast. This mapping was undertaken in spatial geocoded format using the software ArcGIS, with the data also converted into files able to be viewed within Google Earth software. Hard copy representations of these maps were then compiled using Adobe Illustrator.

4. Consultation and Verification

Following this initial mapping step, all 11 coastal local governments (LG) within the study area were contacted and offered the opportunity of consultation. Responses were receied form all LGs, with 10 out of 11 LGs providing feedback for the study. Face to face meetings were held with the largest LGs in the study area - Wanneroo, Joondalup, Stirling, Cockburn and Rockingham - who were asked both to verify the accuracy of the hard copy maps for their area of coastline, as well as to verify the completeness of the audit tool in capturing all potential recreational infrastructure and uses. Feedback from these local governments was used to further refine the maps and audit tool, with hard copy maps then sent out to the remainder of the LGs to cross-check, with feedback received by email from all remaining LGs (excluding Mosman Park). A combination of face-to-face and email consultation was also undertaken with 3 State Government departments and 6 state sporting associations. This consultation process, which comprised several iterative stages, allowed for the completion of both the final Coastal Recreational Use Audit Tool (see following section page 11 and Table 1) and the mapping of all recreational infrastructure and uses (see Part B of this report).

5. Analysis and Classification

The preceding four steps resulted in a comprehensive picture of the distribution of recreational infrastructure and use along the study area. An initial analysis of this distribution was undertaken, the results of which are presented in pages 13 to 20 of this report. When viewed holistically, distinct patterns in distribution became apparent allowing the entire study area to be classified into a series of discrete nodes and connectors. Full details of the resultant Coastal Recreational Use Classification Framework are presented in pages 21 to 35, with the application of the framework also shown in more detail in the maps that comprise Part B of this report.

Coastal Recreational Use Audit Tool

Table 1 shows the full list of recreational infrastructure and uses mapped in the study.

All coastal paths were identified and mapped, including both shared-use and walking paths. Individual beach access paths were also mapped and are available in GIS format, however it was not practical to show these paths in the final maps produced for this report.

Black icons are used to indicate key recreational infrastructure, arranged in a number of sub-categories. These categories of infrastructure can be used as general proxies for the presence of different recreational uses.

Blue icons are used to identify specific locations where specialist recreational uses are known to occur. These icons are not used to identify more general uses (specifically water-base use such as swimming, as well as other beach and park-based uses), which are assumed to occur along the majority of the study area.

Discrete areas of the coast that had been explicitly designated for (or sometimes to prohibit) certain recreational uses are identified through hatchings of various designs and colours.

Once finalised, the Coastal Recreational Use Audit Tool was applied to audit the entire coast within the study area.

Table 1. Mapped infrastructure and uses

Paths	
Paths	Shared use path; Walking path
Infrastructure	
Beachside/park access and facilities	Covered picnic tables; Showers; Bike racks; Universal beach access; BBQs; Public toilets; Car parking
Active recreation facilities	Skate park; Playground; Fitness equipment; Basketball court/ring; Swimming pool; Beach volleyball
Boating facilities	Jetty; Boat ramp; Boat moorings; Water sports club
Community and commercial facilities	Cafe/kiosk; Shopping area; Community centre
Attractions	Lookout; Cultural heritage site; Public artwork; Natural attraction
Safety/rescue organisations	Surf Life Saving (SLS) club; SLS observation tower; Sea rescue
Use Locations	
Use locations	Surfing; Diving; Fishing; Kite/wind surfing; Snorkeling; Kayaking/canoeing/ stand up paddle boarding
Designated Use Areas	
Designated beaches	Dog beach; Dog/horse beach; Horse beach; Clothing optional beach; SLS patrolled beach
Designated aquatic activity areas	Water ski area; Kite surfing exclusion zone; Enclosed swimming areas; Marine park boundary
Coastal features	Nature experience area; Hazard / erosion hotspot

BREAKWATER

Audit Application

In this section, some of the key findings of the application of the Coastal Recreational Use Audit Tool are presented and discussed. The full application of this audit tool is displayed in the maps in Part B of this report.

The majority of the audit mapping process was straightforward, and involved mapping fixed and easily visible recreational infrastructure based on site visits and photography along the study area.

The most common types of infrastructure were those associated with general and specialist water-based and beach use: car parks, showers, public toilets and changing facilities. Such infrastructure was typically centred on one or more beach access, which together constituted a recreational destination or 'node'. Some but not all of these nodes also contained an adjacent grassed area with infrastructure for park-based passive and active recreation: picnic facilities and BBQs, playgrounds and other various active recreational features. Commercial premises were also common, both within these park areas and adjacent developed areas.

Beach access paths were also common and significant pieces of coastal infrastructure, providing relatively consistent access through the conservation area to the beach and ocean from adjacent residential and recreational areas. Often perpendicular and linking these beach access paths were shared-use paths, which form 'connectors' between recreational destinations while also providing for a range of important recreational uses.

To provide a detailed and accurate baseline understanding of the recreational use of the coast, it was necessary to identify and map every individual occurrence of each piece of infrastructure, along with the location of specific recreational uses and designated areas. The full application of the audit is found in Part B of this report, which identifies these occurrences in a series of 28 maps along the coast (see example in Figure 2). The combined patterns of these infrastructure and associated uses across the study area are the basis for the Coastal Recreational Use Classification Framework outlined from page 21 onwards in Part A of this report.

In addition to this detailed mapping, insights could also be gained from identifying and discussing the distribution of individual groupings of infrastructure and uses along the entire coast in a single map. The most common and significant of these infrastructures, uses and designated areas are discussed in more detail in the following pages - and include:

- Shared paths and supporting infrastructure;
- General water-based use;
- Universal beach access;
- Specialist water-based use;
- Animal exercise areas; and
- Boating and marine parks.

Figure 2: Example application of Coastal Recreational Use Audit Tool to a section of the Perth coast. (Marmion to Bennion Beach - see Part B: Map 10).

Shared Path Network and Supporting Infrastructure

Shared paths – that is, paths for use by both pedestrians and cyclists – are one of, if not the most significant piece of recreational infrastructure along the coast. These paths serve a range of functions: providing largely uninterrupted transport links between coastal and other significant suburban locations, hence facilitating physical activity both through transport and recreational use, and providing aesthetic and educational experiences at other various intervals. These paths are the 'connectors' that both link coastal recreational destinations and infrastructure and constitute a major recreational asset.

In regards to the first function, the shared path system provides a high quality, safe and often uninterrupted transport network between key suburban locations. As shown in Figure 3, the shared path runs largely uninterrupted north of the river between Burns Beach in the north and City Beach in the south. While more fragmented south of the river, there are still key linkages within the areas south of Fremantle and south of Rockingham. Conservation reserves and industrial areas are the main sources of fragmentation across the system.

Shared paths were commonly observed being used by walkers, joggers and cyclists of various ages and fitness levels. As well as the aforementioned qualities of these paths, the addition of infrastructure such as bike racks, water fountains and sheltered seating make these paths unique and important resources for encouraging physical activity (Figures 4 and 5). Further to this, the often significant aesthetic experiences of the landscape, when compared to other shared paths such as those running along major roads or train lines, give an additional reason to exercise (Figure 6).

Figure 3: Shared path network

Figure 4: Signage clearly indicates the role of shared paths as transport links between key coastal locations, while bike racks at various locations allow cyclists to utilise beaches and parks as part of their trips.

Figure 5: Shaded seating and signage are common features that add to the experience of shared paths users; directional information to nearby destinations can also be seen on the path.

Figure 6: The location of shared paths and supporting infrastructure along raised foreshore areas are one of their unique attractions for undertaking physical activity.

Shared and Walking Path Recreational Experiences

While noting the primary purpose of shared paths for active transport and recreation, the additional recreational experiences provided by these and other path networks and their supporting infrastructure are often significant.

Where the landscape is elevated, seating and shelter at various locations along the paths provide unique vantage points for views of the ocean and landscape in both directions along the coast. Such 'lookout' points (see example in Figure 6 on previous page) are identified in Figure 7.

Other pieces of infrastructure were also commonly provided along shared paths, often centred at lookout points, to enhance recreational experiences. Public artwork was one of the most common, serving both an educational and aesthetic purpose, and varying from subtle and creative measures such as toilet block murals and artistic bike racks and drinking fountains to more distinctive artefacts (Figure 8). In many instances, such installations acted as sites for the recognition of culture and heritage values, including monuments and memorials (Figure 9). Such features, which also contribute to both educational and aesthetic experiences, were identified at numerous key locations along the coast (Figure 7). Explanatory signage was typically included to assist with education purposes, and also provided at various other strategic locations along paths to facilitate learning about environmental and cultural values (further examples of this are provided on page 32)

Due to the heavy use of the shared path networks, including often by high intensity active recreational users, opportunities for many of these recreational experiences were also found on separate walking paths. In addition to the aforementioned infrastructure and experiences, the fact that these paths were constructed to pass through more secluded natural landscapes made them particularly conducive to nature and wilderness experiences (Figure 10). The most significant of these locations are mapped as 'nature experience' areas in Figure 7.

Figure 7: Shared use and walking paths

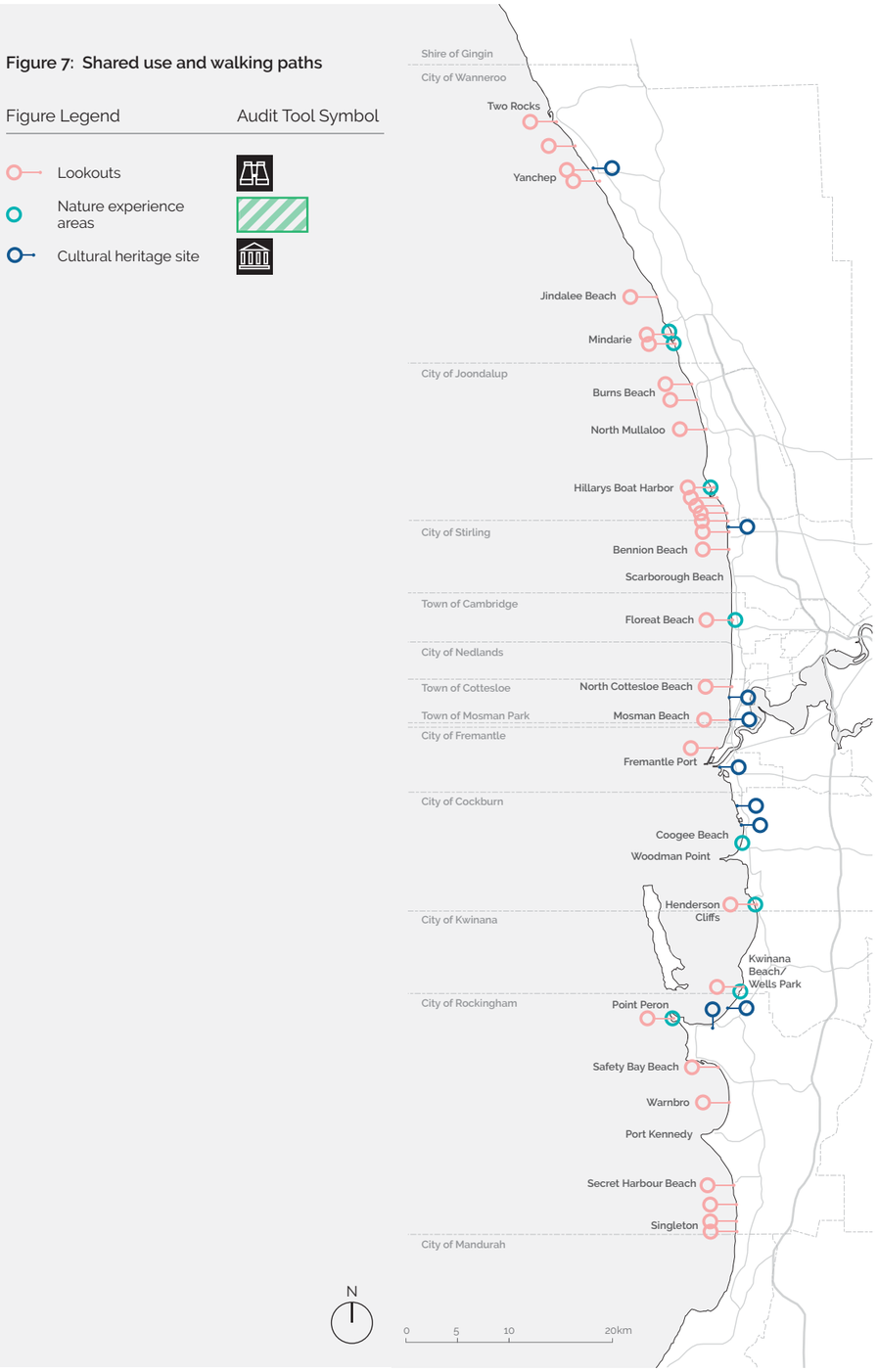


Figure 8: Distinctive public art features are particularly common along the Cottesloe foreshore.

Figure 9: The Vlamingh Memorial south of Cottesloe provides both educational and aesthetic opportunities.

Figure 10: The walking paths at Hillarys Beach Park (Whitfords Nodes) provide a distinct natural experience and access to two lookout points.

General Water-based Use

General water-based use can be assumed to occur along the study area wherever beach access paths have been provided. However, some features were identified that are likely to be linked to high levels of such use. For example, the presence of enclosed swimming nets, likely to result in areas of high use by less experienced beach users, were identified at three beaches: at Quinns/North Mindarie Beach, Sorrento Beach and Coogee Beach as shown in Figure 11.

A more consistent indicator of general (and to an extent specialist) water-based use within the study area is surf life saving (SLS) activity. SLS clubs serve a range of community functions: most notably ensuring the safety of beach users through patrols by vehicles, boats and also drones (Figure 12). Clubs also provide a range of programs for different social groups – including children, mothers and people of different abilities – and also run state and national competitions both for the general public and members.

The first step in mapping SLS was to identify the location of physical SLS clubs. 15 club buildings were identified in the study area, from Yanchep in the north to Secret Harbour in the south. It is notable that SLS clubs are distributed primarily north of the river – particularly between Fremantle and Trigg – with only two clubs south of the river. Located adjacent to most SLS clubs are semi-permanent observation towers (Figure 13 and 14).

As well as the infrastructure, the approximate extent of patrolled beach areas was also mapped. Patrolled areas often extend away from SLS club buildings – for example Trigg SLS club is responsible for patrolled areas north to Watermans Bay Beach. These areas should be seen as indicative only, and are subject to change and seasonal variation. Live information on patrolled areas is available at www.beachsafe.org.au.

An additional feature related to SLS activity and water-based use but not mapped are Beach Emergency Number (BEN) signs. These signs are currently in the process of being rolled out across all local governments in the study area, and should be included in future recreational mapping of the coast.

Figure 11: Surf life saving facilities

Figure Legend	Audit Tool Symbol
Surf lifesaving club	
SLS observation tower	
SLS patrolled beach	
Enclosed swimming area	

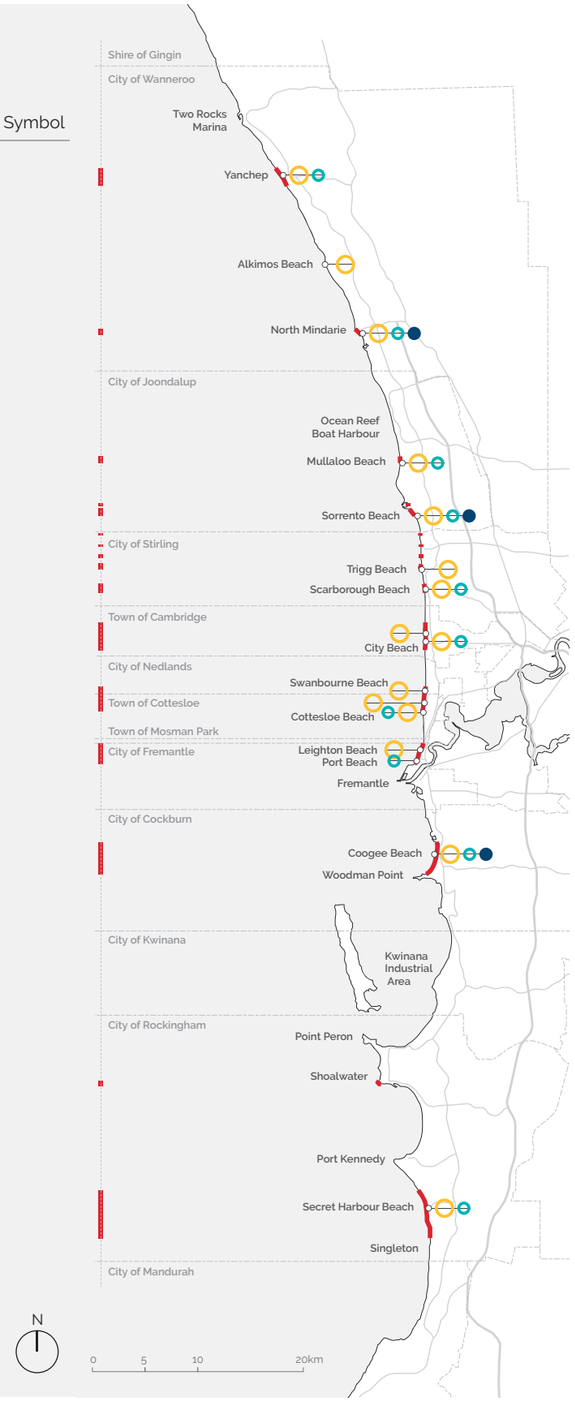


Figure 12: SLS patrols at Secret Harbour Beach.

Figure 13: Signage indicating the presence of SLS patrol at City Beach. The observation tower can be seen on the groyne in the background.

Figure 14: An example of a smaller scale, temporary observation tower at North Cottesloe Beach.

Universal Beach Access

Providing universal access to the beach is becoming a key priority for LGs and other coastal stakeholders, including SLS clubs. As such, infrastructure that facilitates universal access is an important dimension of understanding general water-based use.

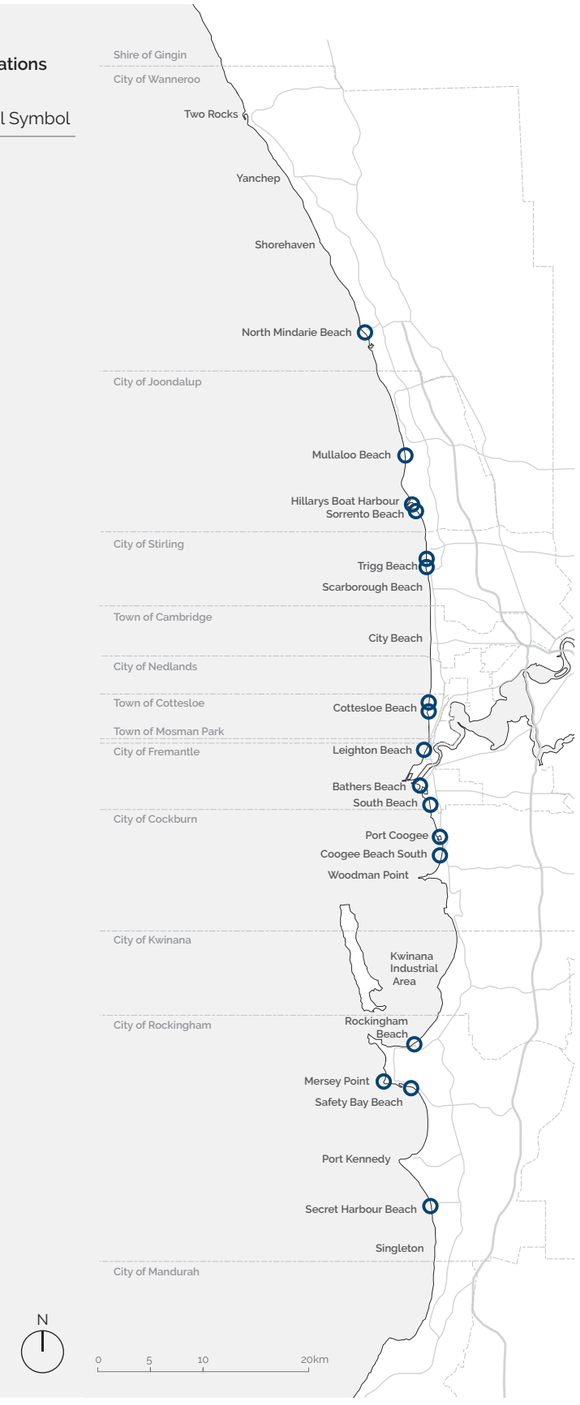
The most fundamental aspect of universal access is physical wheelchair access to the beach, typically through the provision of dedicated ramps with minor gradients (Figure 16). Some locations also provide special matting that allows wheelchairs to be maneuvered directly into the water (Figure 17). Some beaches also have universal changing facilities adjacent to the beach, such as the 'Changing Places' rooms currently found at Scarborough and Sorrento. These facilities are often complemented by opportunities to hire special beach and water wheelchairs (e.g. 'beach trekkers'). Such opportunities are typically provided through SLS clubs, and occasionally through other local businesses: for example, from the WA Shipwrecks Museum at Bathers Beach and South Beach Café in Fremantle,

Universally accessible locations mapped in this study (Figure 15) were generally those with a combination of physical beach access and associated beach wheelchair hire. Such locations were identified at most major beaches, but not consistently across the study area. Also mapped using the same icon were unique accessible locations, such as the fishing platform in Hillarys Boat Harbour (Figure 18). Ideally, future mapping of universal beach access would identify these aspects individually, and would serve to identify gaps in infrastructure and service provision along the coast. Consideration should also be given to the availability of ACROD parking spaces.

In addition to the locations mapped here, initiatives such as inclusion programs run by SLS clubs are also important in ensuring universal access to the beach and ocean.

Figure 15: Universal beach access locations

Figure Legend	Audit Tool Symbol
Universal beach access	



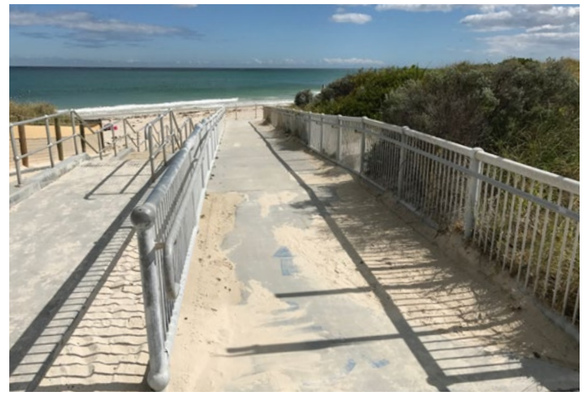


Figure 16: Universal beach access ramp at North Mindarie/Quinns Beach.

Figure 17: Ramps and matting facilitating wheelchair access to the water at Hillarys Boat Harbour Beach.

Figure 18: Hillarys Boat Harbour also has a dedicated universal access fishing platform.

Specialist Water-based Use

Specialist water-based uses proved somewhat difficult to map, as many uses can and do occur along virtually the entire extent of the study area. Recreational fishing is one example. While some specific fishing spots were identified due to the presence of formal signage and infrastructure such as tackle disposal bins, there are general locations – including jetties, groynes and other rocky outcrops – that can be assumed to be strongly associated to fishing use.

More consistent identification of use locations was possible for conventional stand-up surfing ('surfing'), and are shown in Figure 19. For many well-known surfing spots, signage clearly identifies its use for these purposes, and are also utilised for lessons by commercial operators (Figure 20). In other instances, common surfing spots were determined from local surfing websites. However, in some instances these spots are located in ocean areas not formally designated for swimming, and often where swimming is actively discouraged (Figure 21). Mapped surfing spots found a middle ground between those well used by surfers and those where water-based recreation was designated and encouraged by the LG.

Another key specialist water-based use was kite/wind surfing – while separate uses, they were grouped together in this study, as their use locations were largely equivalent. Again, a combination of formal signage (e.g. Figure 22), informal online user websites and consultation with relevant stakeholders were used to identify use locations. As well as specific use locations, exclusion zones were also identified along the coast of Joondalup and Cockburn. Effective exclusion zones for all types of surfing also exist along patrolled SLS areas.

Figure 19 shows that conventional surfing spots are more common north of the river, with only Secret Harbour mapped south of Fremantle. Conversely, kite and wind surfing spots are more common south of the river, and particularly in sheltered areas in the Cockburn Sound and Shoalwater Bay.

Other specialist uses including kayaking, canoeing and stand-up paddle boarding were mapped opportunistically but not comprehensively (see Part B) – typically where the presence of commercial operators for that use were identified.

Figure 19: Surfing and kite surfing locations

Figure Legend	Audit Tool Symbol
Surfing location	
Kite/wind surfing location	

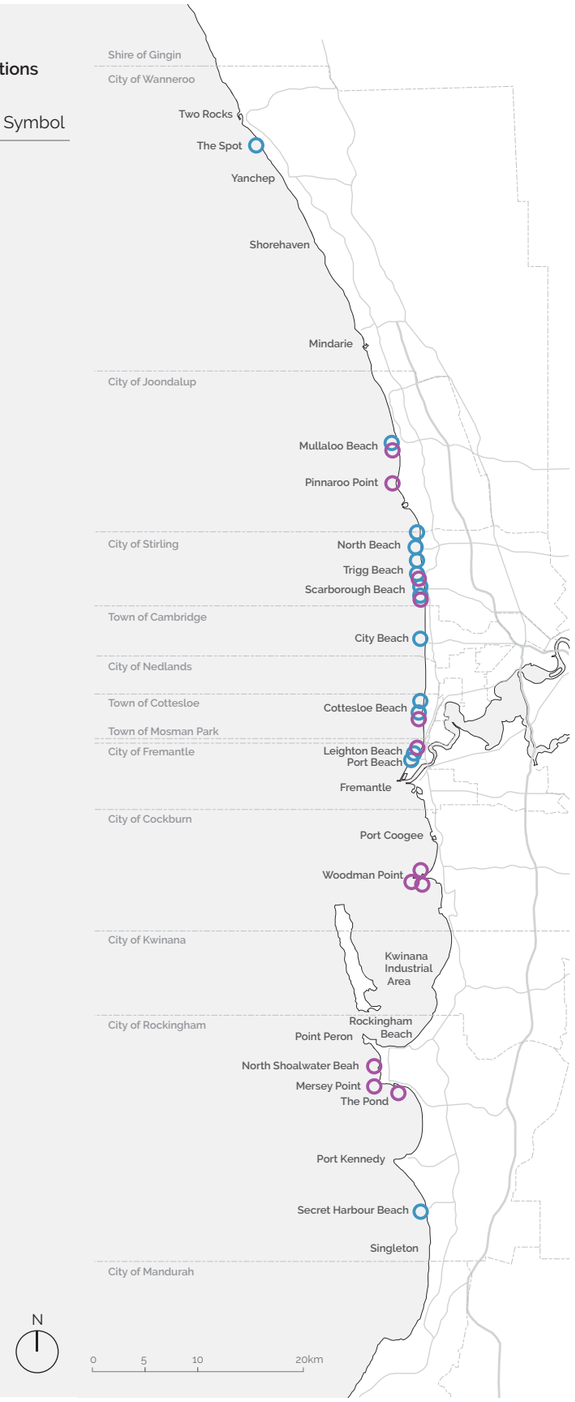


Figure 20: Signage at South Cottesloe clearly identifies the surfing spot known by users as 'The Cove'.

Figure 21: Clayton's Beach is a well known surfing spot just south of Mindarie Marina, however formal signage discourages swimming.

Figure 22: Signage along the Joondalup coast clearly identifies prohibited and permitted areas for kite surfing use.

Animal Exercise Areas

Of all the recreational use areas along the coast, animal, in particularly dog exercise was the most straightforward to map (see Figure 23). This was due to the almost universal designation of dog beaches across all local government areas. Many local governments provide detailed maps of dog beaches on their websites, while signs at the entrance to beach access paths are generally clear in showing whether dog exercise is allowed on that beach, often accompanied by the provision of 'Poo-ch pouch' bags. As shown by the example of Hillarys dog beach in Figures 24 and 25, there is often strong community use and ownership of dog beaches, with advertising for local dog services common.

Figure 23 shows that the distribution of dog beaches south of Perth is very even, with the two main gaps being the non-residential areas of Henderson, Kwinana and Port Kennedy Scientific Park. Distribution north of the river is less consistent. Most notably, Hillarys dog beach is the only designated dog exercise area within the City of Joondalup, which runs from Burns Beach in the north to Marmion in the south. The next designated dog exercise area is north of Tamala Park in Quinns Rocks. This lack of provision appears largely due to the high recreational use of beach areas around Mullaloo, and only narrow beach areas along Ocean Reef, Iluka and Burns Beach.

Further complicating this picture is the fact that a portion of Hillarys dog beach is also used for horse exercise, which has in the past resulted in conflicts between animals and owners. An additional two horse beaches were identified at CY O'Connor Beach in Coogee (Figure 26), and between Kwinana and Rockingham. A further horse beach exists within the Kwinana Industrial Area, however it is soon to have its access restricted.

Figure 23: Animal exercise beaches

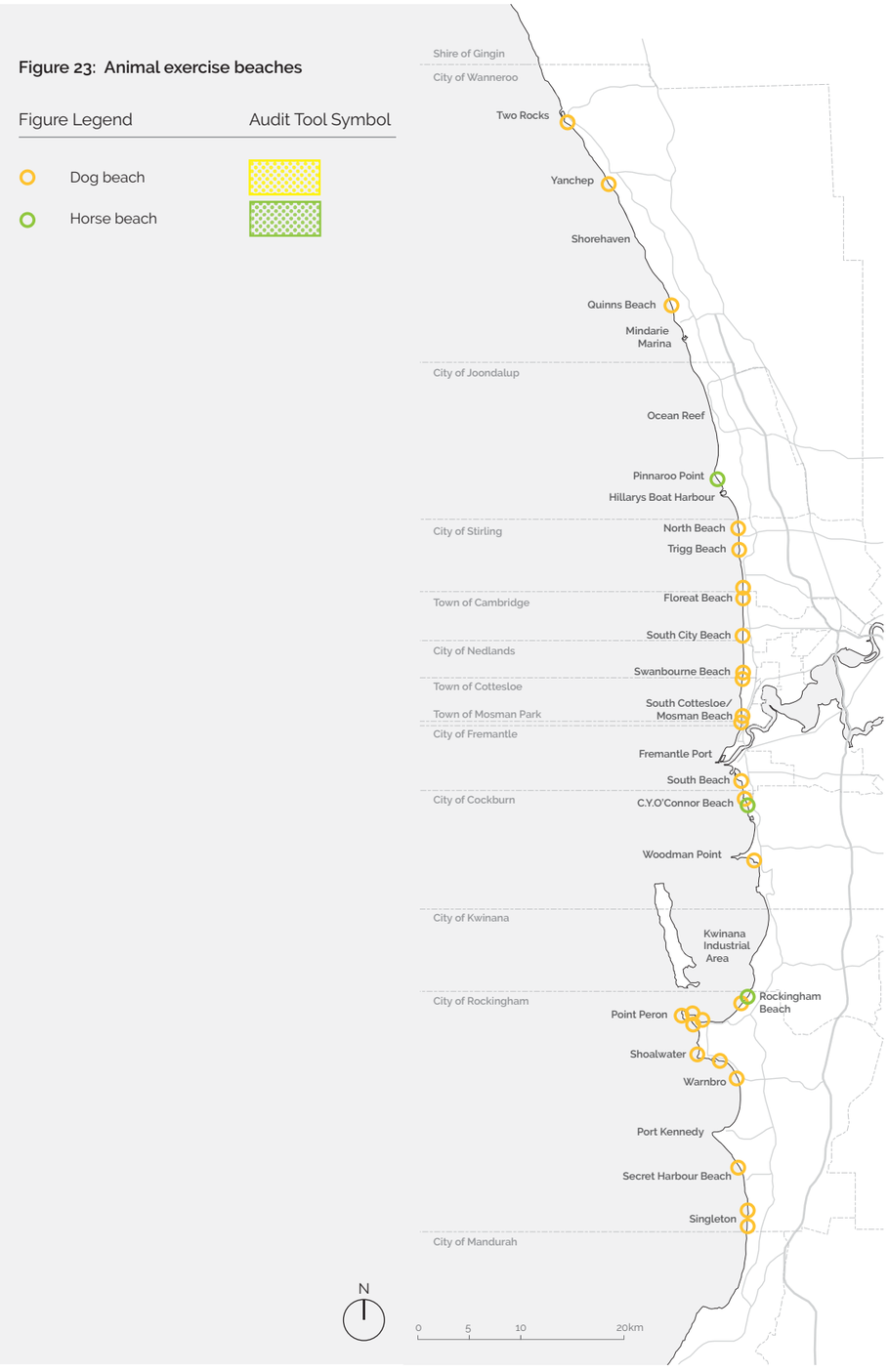


Figure 24: Entrance to Hillarys Dog Beach showing signage, 'Poo-ch pouch' dispensers and local dog service advertising.

Figure 25: Level of use of Hillarys Dog Beach on a weekday morning.

Figure 26: Loading areas for horses are provided at C Y O'Connor Beach.

Boating and Marine Parks

Detailed maps of recreational boating use of certain areas of the Perth coast are provided by the Department of Transport. Mapping in this study focused on on-land and near-shore infrastructure and designated areas with most relevance to recreation, and applied this along the entire coast.

The presence of boat launching facilities ('boat ramps') was the clearest proxy for recreational boating use. These locations identified in Figure 27 typically comprise at least one, but often multiple, boat launching ramps that allowed vehicular access directly into the ocean (Figure 28), along with parking spaces large enough for cars and trailers.

Figure 27 shows boat launching facilities to be more common south of the river, mainly in the relatively sheltered marine areas in Cockburn Sound and Port Kennedy. The coast north of Perth is much more exposed and boat launching requires artificial protection measures in the form of groynes, with 4 out of the 5 facilities situated in boat harbours.

Marinas are those boat harbours with mooring facilities, and were identified at Two Rocks, Mindarie, Hillarys, Fremantle, Port Coogee. Additional mooring facilities were identified at Mangles Bay (Figure 29). Water sports clubs were found within or adjacent to many boat launching and mooring facilities. Sea rescue clubs – typically volunteer organisations that attend to distress calls from boating and other more remote water ocean users – were also mapped.

Water skiing involves a skier being towed behind a boat traveling beyond 8 knots, with 5 designated areas identified: Quinns Rocks, Mullaloo, Woodman Point, Rockingham and Warnbro.

Designated marine parks and protected areas place limits on boating activity and related uses such as fishing (Figure 30). Three Marine Parks were identified: the two large parks at Marmion and Shoalwater, and the smaller area adjacent to Cottesloe and Mosman Park.

Figure 27: Boat launch areas, water sports clubs and Marine Parks

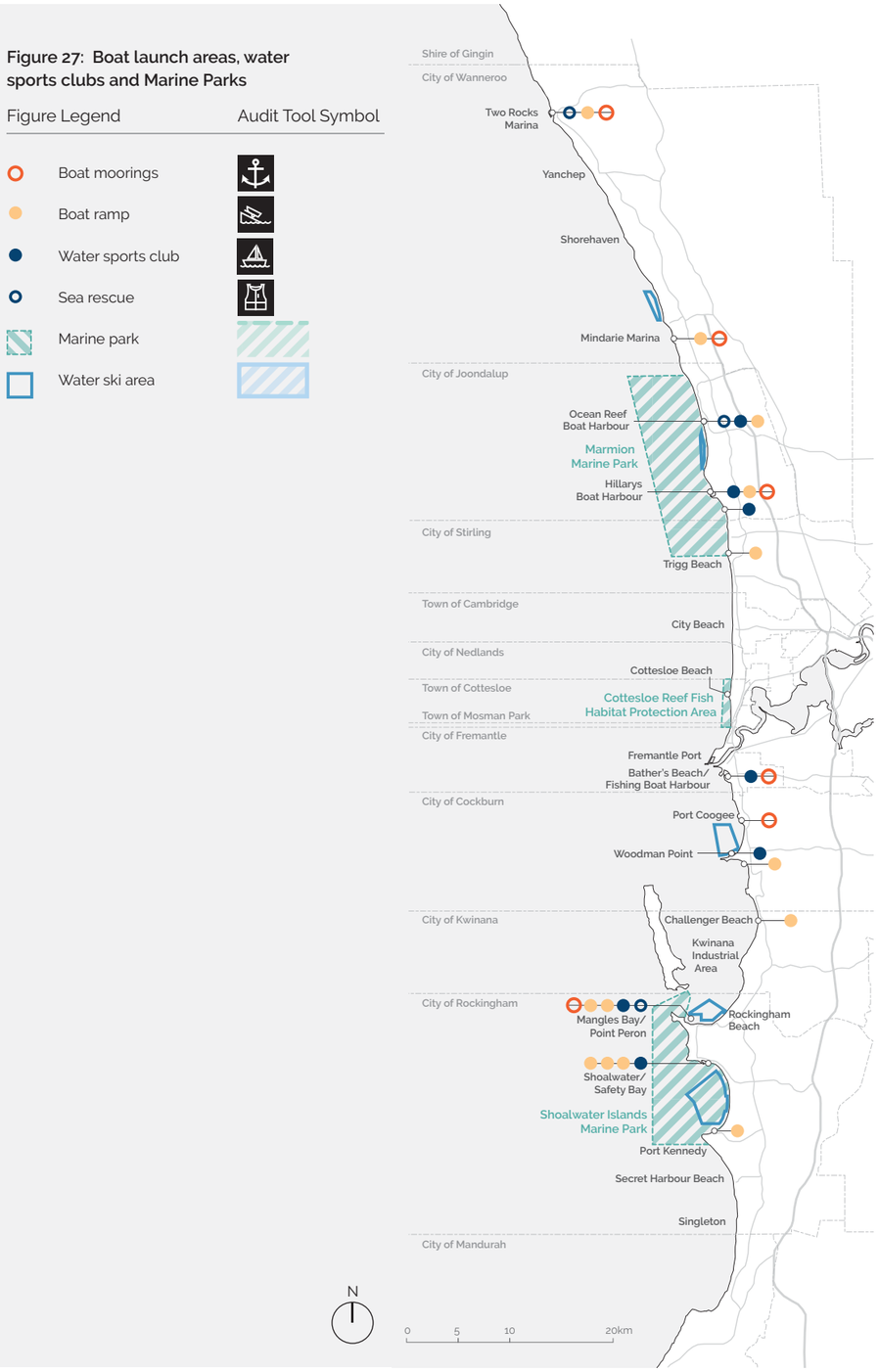


Figure 28: Boat launching facilities at Mindarie Marina.

Figure 29: Boat Mooring is provided at Mangles Bay both on land in private water sports clubs, and in the near shore marine area.

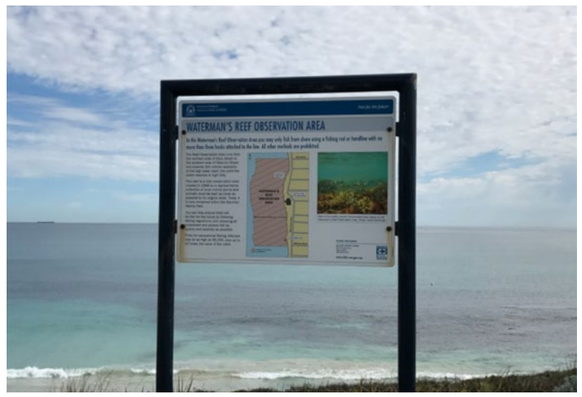


Figure 30: Designated marine protection areas, such as Waterman's Bay within Marmion Marine Park, place restrictions on fishing activity.

Coastal Recreational Use Classification Framework

Once the application and mapping of the Coastal Recreational Use Audit Tool was finalised, overall patterns in the provision of recreational infrastructure and the occurrence of recreational uses became apparent. Fundamentally, it became clear that two broad types of coastal locations existed - nodes and connectors - each of which are now defined within the context of this report.

Nodes

Nodes are developed areas within a foreshore reserve that have a variety of infrastructure to allow for a range of passive and active recreation activities. At a minimum, nodes provide access to the coast for both beach and water-based use, and may provide additional recreational opportunities away from the beach. Nodes range from being relatively small with few facilities – e.g. a small car park and a shower – to large with multiple of facilities and commercial premises (cafes etc.). The extent of the development at a node is one key determiner of the number of visitors to the site and also where they come from (i.e. the node's catchment). Small nodes primarily serve the local community, and visitor numbers are relatively low. Larger nodes that have many more facilities including commercial premises may attract visitors from all over Perth and also tourists from outside Perth. In some cases, the node might become fully developed, such as in the case of boat harbours and ports, which may in turn enable some forms of recreation whilst prohibiting others.

Connectors

Connectors are those areas of foreshore reserve that act as links between two nodes. They have few if any infrastructure other than a formal path, although in more remote areas the path is absent. The foreshore is often dominated by natural vegetation, although in more built up areas the foreshore is much narrower and can have extensive grassed areas. Visitors typically pass through these areas either to exercise (walk, run, walking the dog etc.) or to access adjacent beaches or nodes, but may also stop and use specific locations (e.g. lookouts) for passive recreational purposes.

These two types of locations, which can be further classified based on variations in infrastructure provision and recreational use, form the basis of the subsequent Coastal Recreational Use Classification Framework (the framework) set out in Table 2. It should be noted that the types of nodes and connectors are generalised, and example sites listed under each type may have specific infrastructure and uses that fall outside of these descriptions. Nonetheless, the framework offers a useful starting point for classifying the coastline based on overall patterns in recreational infrastructure and use.

The framework identifies seven types of nodes, five of which (excluding ports and industrial areas) are predominantly recreational. While the order in which the nodes are discussed is in increasing size and intensity of development and infrastructure provision, the key distinguishing factor between each level of node is the addition, and sometimes loss of, specific types of recreational uses. The five recreational use node categories are:

- **Beach access nodes** – provide for only beach and water-based uses;
- **Minor activity nodes** – provide additional park-based active and passive uses, with greater capacity for specialist water-based use;
- **Moderate activity nodes** – provide a greater variety of park-based recreation, including commercial and indoor uses, however may restrict specialist water-based uses;
- **Major activity nodes** – provide more extensive commercial opportunities and are typically used for tourism purposes;
- **Boat harbour nodes** – facilitate many specialist water-based (boating) uses, however can restrict many water, beach and park-based uses.

The framework also identifies three types of coastal connectors. The order shown for the connectors reflects decreasing naturalness or presence of native vegetation in the foreshore reserve and increased infrastructure provision, which again accords to the gain and/or loss of specific recreational uses. The three recreational use connector categories are:

- **Wild connectors** – have limited beach and water-based recreation, however may provide unique aesthetic, nature and wilderness experiences;
- **Dune path connectors** – permit greater access to the beach and typically contain shared paths and supporting infrastructure that facilitate a range of additional recreational uses, along with enhanced aesthetic and educational experiences;
- **Urban connectors** – have enhanced water and beach and path-based uses, however have negligible nature and wilderness experiences.

Table 2 sets out in detail the Coastal Recreational Use Classification Framework. Following Table 2, each of the classification categories are discussed in detail, with specific examples provided and their distribution across the study area mapped. Finally, Figure 71 (pages 34 and 35) shows the full application of the framework, displaying every node and connector along the entire study area.

Table 2. Coastal Recreational Use Classification Framework

BEACH **NODES**

Class	Descriptor	Typical characteristics and infrastructure	Typical recreational uses and values	Examples
N1	**Beach Access Node**	• Small development footprint, almost entirely continuous with adjacent connectors save for parking space adjacent to a beach access path. • Facilities provided for use by a local population that typically include a single car park with at least one of the following: outdoor shower, toilet block, bicycle rack and drink fountain.	• Uses are solely focused on the beach and for general water-based recreation, with some specialist water-based uses possible. • Node often utilised as access point to shared pathways and dog exercise areas running through adjacent connectors. • Recreational experiences similar to class of adjacent connector.	• Wanneroo: Quinns Dog Beach Access • Joondalup: Kallaroo/North Hillarys Beach Access • Stirling: North Beach Jetty, Peasholm Dog Beach • Cambridge: Floreat Dog Beach Access (see detailed example p24), Floreat Drain • Mosman Park: Mosman Dog Beach • Fremantle: Leighton Dog Beach • Kwinana: Challenger Beach • Rockingham: Waikiki/Warnbro Beach Access
N2	**Minor Activity Node**	• A small to moderately sized development footprint, largely continuous with adjacent connectors. • Facilities for beach access and water-based recreation typically include all of the aforementioned Beach access node infrastructure. • Also includes basic park-based recreation facilities such as a grassed area, play equipment and picnicking facilities.	• Uses are still largely focused on the beach and for general water-based recreation, with greater likelihood of specialist water-based uses. • Grassed areas and other facilities enable park-based passive and active uses such as play, picnicking and socialising to occur adjacent to the beach. • Node often utilised as access point to shared pathways and dog exercise areas running through adjacent connectors. • Recreational experiences similar to class of adjacent connector.	• Wanneroo: Leeman's Landing, Queenscliffe Park • Joondalup: Iluka Beach, Pinnaroo Point (see detailed example p25) • Stirling: Hammersley Pool, South Trigg Beach • Cambridge: South City Beach Dog Beach • Cottesloe: South Cottesloe Beach • Fremantle: South Fremantle Dog Beach • Cockburn: North Coogee Dog Beach • Kwinana: Kwinana Beach (Wells Park) • Rockingham: Shoalwater Beach (Lions Park), Golden Bay and Singleton Beaches
N3	**Moderate Activity Node**	• A medium sized development footprint that breaks up the adjacent connectors. • Facilities as per Minor activity node (car parking, beach amenities, play equipment etc.) provided on a larger scale capable of catering for population outside the local area. • Typically includes at least one *community* (e.g. adventure playground, SLS clubrooms, boat ramp) or *commercial* recreation facility (water sports club, kiosk/café, restaurant, caravan park) that encourages use from outside local population.	• High use for general water-based recreation and beach-based recreation, with dog exercise generally prohibited. • Allows for unique specialist water-based opportunities that attract a broader population (e.g. protected swimming, surfing, boating, SLS, scuba diving), however high general use may restrict other specialist uses (e.g. surfing within SLS patrolled areas). • Park areas provide extensive passive and active opportunities, may be used for organised active pursuits such as professional personal training, and may also accommodate small to moderate scale sporting and community events. • Commercial opportunities are common, while community and commercial facilities provide unique indoor opportunities such as dining, meeting, and shopping. • Site-specific educational and aesthetic experiences possible (e.g. public art, heritage features); nature and wilderness experiences lost.	• Wanneroo: Yanchep Lagoon, Jindalee Beach, Quinns/North Mindarie Beach • Joondalup: Burns Beach, Mullaloo Beach, Sorrento Beaches (see detailed example p26) • Stirling: Waterman's Bay Beach, North Beach, Bennion Beach, Brighton Beach • Cambridge: Floreat Beach • Nedlands: Swanbourne Beach • Cottesloe: North Cottesloe Beach • Fremantle: Leighton Beach, Port Beach and South Beach • Cockburn: John Graham Reserve • Rockingham: Naval Memorial Park, Shoalwater Beach (Mersey Point), Safety Bay Beach, Secret Harbour Beach.
N4	**Major Activity Node**	• A medium to large sized development footprint that may extend some distance, with commercial and tourism facilities adjacent to the reserve. • Facilities as per Moderate activity node, scaled to accommodate significant visitation, including: restaurants and commercial precincts; large SLS and other sport and recreation clubrooms; large caravan parks. • Activity infrastructure may include designated beach recreation areas such as beach volleyball, entertainment areas or amphitheatres, extensive play and picnic areas at multiple points along node.	• Used for beach, park and general water-based recreation as per minor activity node and with significant commercial activities (such as dining, shopping, meetings etc.) at or adjacent to the beach, typically with tourist potential. • Used for commercial specialist uses such as surfing school, kayak/SUP hire and training, water-based eco-tours, diving or snorkelling. • Commercial indoor opportunities and/or large-scale special events of uniqueness and significance that attract tourism use. • Additional experiences as per Moderate Activity Node.	• Stirling: Trigg Beach, Scarborough Beach • Cambridge: City Beach • Cottesloe: Cottesloe Beach (see detailed example p27) • Fremantle: Bathers Beach • Cockburn: Coogee Beach • Rockingham: Rockingham Beach

DEVELOPED **NODES**

Class	Descriptor	Typical characteristics and infrastructure	Typical recreational uses and values	Examples
-	**Boat Harbour Node**	• A medium to large sized development footprint depending on scale of node, characterised by artificial barriers that protect the near shore marine area for boating. • Marinas are distinguished from boat launching harbours through the presence of boat mooring facilities. • Commercial uses integrated into the node at varying scales, namely relating to dining and water sports, often with a tourism function. • Some harbours provide small beach areas with associated recreation infrastructure and uses.	• Enables some forms of specialist and infrastructure dependent recreation: mainly boating, but also fishing and kayak/SUP boarding. • Generally prohibits other beach and water based recreation if no beach area is provided. • May be used for commercial activities such as kayak/SUP boarding hire and training, water-based eco-tours, diving or snorkelling	Boat Launching Harbours • Ocean Reef Marina • Woodman Point Boat Launching Area • Mangles Bay Boat Launching Area Marinas • Two Rocks Marina • Mindarie Marina • Hillarys Boat Harbour • Fremantle Harbour • Port Coogee Marina
-	**Port**	• Extensive development footprint however focused on industrial and commercial rather than recreational purposes. • Unused facilities and infrastructure derived from port-related activities may be used for cafés/restaurants and tourist-related commercial premises.	• May be used for opportunistic specialist uses, such as fishing from the moles. • May be used as a base for tourism and commercial-based specialist uses.	• Fremantle Port
-	**Industrial Area**	• Extensive development footprint however focused on industrial and commercial rather than recreational purposes.	• While the industrial parts of the node are inaccessible, areas of the foreshore and beach may be used for recreation when accessed from the north and south of the node. • Low use may be favourable for some specialist forms of recreation, for example dog and horse exercise.	• Woodman Point • Henderson • Kwinana (see detailed example p30)

CONNECTORS

Class	Descriptor	Typical characteristics and infrastructure	Typical recreational uses and values	Examples
C1	**Wild Connector**	• The coastal reserve conservation area is relatively wide and undeveloped, with prevalent dune systems and natural environment systems. • Limited or no physical infrastructure such as fencing, signage, pathways or lookout points. • Informal paths may enable public access to beach. • No formal recreation facilities provided.	• Potential but limited use for beach and general water-based recreation given remoteness of location. • Some specialist water-based recreation such as surfing and fishing, although beach access generally limited. • Some dune-based recreation (e.g. 4WD, hiking), although not always for formally designated purposes. • Remoteness may be main attractor, with high potential for aesthetic, nature and wilderness experiences.	• North Two Rocks (see detailed example p31) • Tamala Park • Port Kennedy Scientific Park
C2	**Dune Path Connector**	• The coastal reserve is relatively wide and undeveloped apart from established shared paths along the boundary or through reserve, with long and often frequent beach access paths. • Limited infrastructure along pathways such as fencing, signage, lookout points, occasional seating and drinking fountains. • Seating and signage typically placed in strategic locations to enhance aesthetic and educational appreciation of the landscape. • Little formal recreation facilities provided outside of pathways.	• Greater potential for some beach and water-based recreation, particularly dog exercise, with cycling and other active uses facilitated by the path. • Shared path and supporting infrastructure facilitates a range of active (e.g. walking, jogging cycling) and passive (e.g. appreciation of the landscape and ocean) uses. • Greater potential for specialist water-based recreation such as surfing and fishing. • Typically no dune–based uses, with recreation limited to formal pathways to minimise environmental impact. • Still high potential for aesthetic and nature experiences; reduced wilderness but enhanced educational experiences.	• Iluka Foreshore (see detailed example p32) • Ocean Reef Foreshore • South Scarborough/Floreat Foreshore • Waikiki/Warnbro Foreshore • Golden Bay/Singleton Foreshore
C3	**Urban Connector**	• The coastal reserve is relatively narrow and often developed (grassed) with limited areas of remnant native vegetation. • Formal shared paths mostly run along the eastern boundary of the reserve adjacent to local roads with on-street parking and shorter beach access paths. • May include seating and multiple lookout points, with other minor public amenities such as showers.	• High potential for beach and water-based recreation, particularly dog exercise. • Shared path and supporting infrastructure continues to facilitate a range of active uses, although less passive opportunities. • Specialist water-based uses such as surfing and fishing enhanced due to greater proximity to the beach from parking areas, along with the addition of minor amenities and space for equipment setup. • Still high potential for aesthetic and education experiences, but with negligible nature and wilderness experiences.	• North Beach Foreshore • Cottesloe Foreshore (see detailed example p33) • Safety Bay Foreshore

Beach Access Nodes

Beach access nodes typically consist of small to moderate car parks with changing and/or shower facilities that support beach and water-based recreational use – typically general but occasionally specialised (Figure 31 and 32). Notable clusters of these nodes can be seen in Figure 33 around Waikiki and Warnbro, indicating a specific residential character for these suburbs.

Figure 31: Larger beach access nodes have full toilets and changing facilities, such as Hillarys Dog Beach.

Figure 32: Aside from a small car park, an outdoor shower is the only recreational infrastructure at the Floreat Dog Beach access node.

Figure 33: Beach access nodes distribution

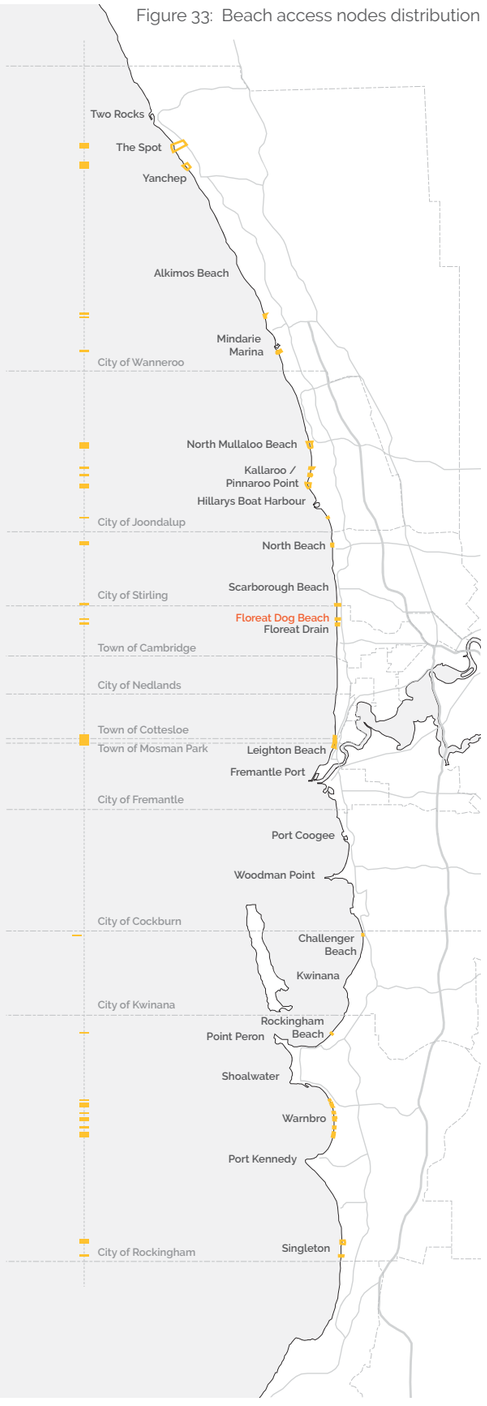
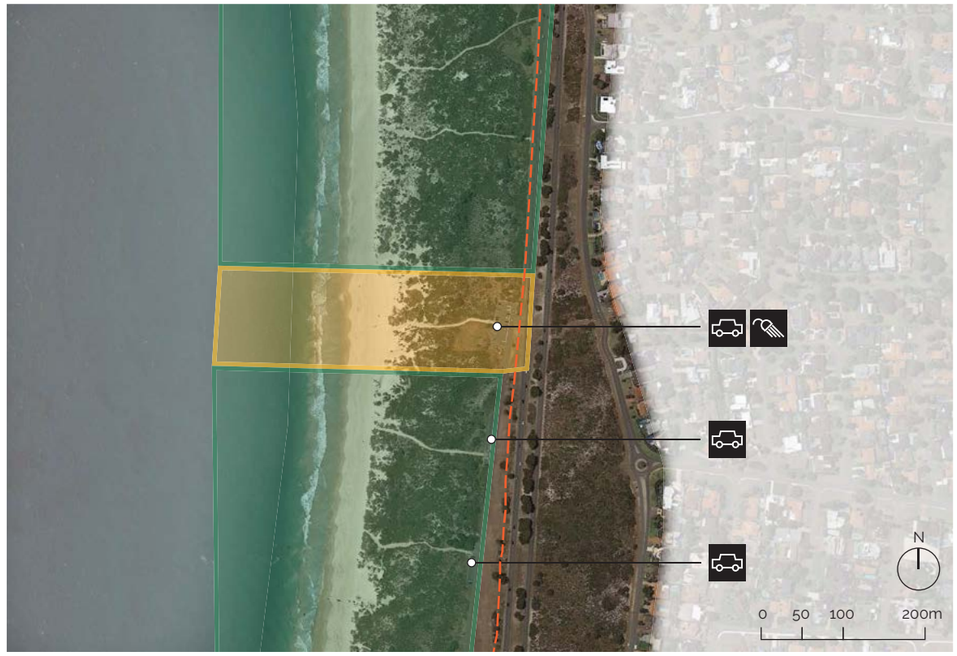


Figure 34: Floreat Dog Beach Access Uses and Infrastructure



Legend

Showers

Car parking

Shared use path

Example: Floreat Dog Beach Access

Floreat Dog Beach access is given as an example of the minimum level of development needed for classification as a node. The presence of a car park within the foreshore reserve makes it a destination for beach users, and hence a node, while the presence of a shower and fencing around the path (Figure 32) encourages increased level of use compared to a standard beach access path. Potential 'nodes' also shown to the south in Figure 34 have small parking areas adjacent to the beach access path, however, contain no marked parking spaces and/or shower facilities, and are hence included as part of the connector.

Minor Activity Nodes

Minor activity nodes are distributed consistently along the study area (Figure 37). They are distinguished from beach access nodes by an adjacent grassed area that provides for a range of passive and active park-based uses.

Figure 35: The main use of minor activity nodes such as Pinnaroo Point remains water-based recreation, in this case for specialised uses such as kite surfing.

Figure 36: Basic playground and picnic facilities at Pinnaroo Point are typical of that found at larger minor activity nodes.

Figure 37: Minor activity nodes distribution

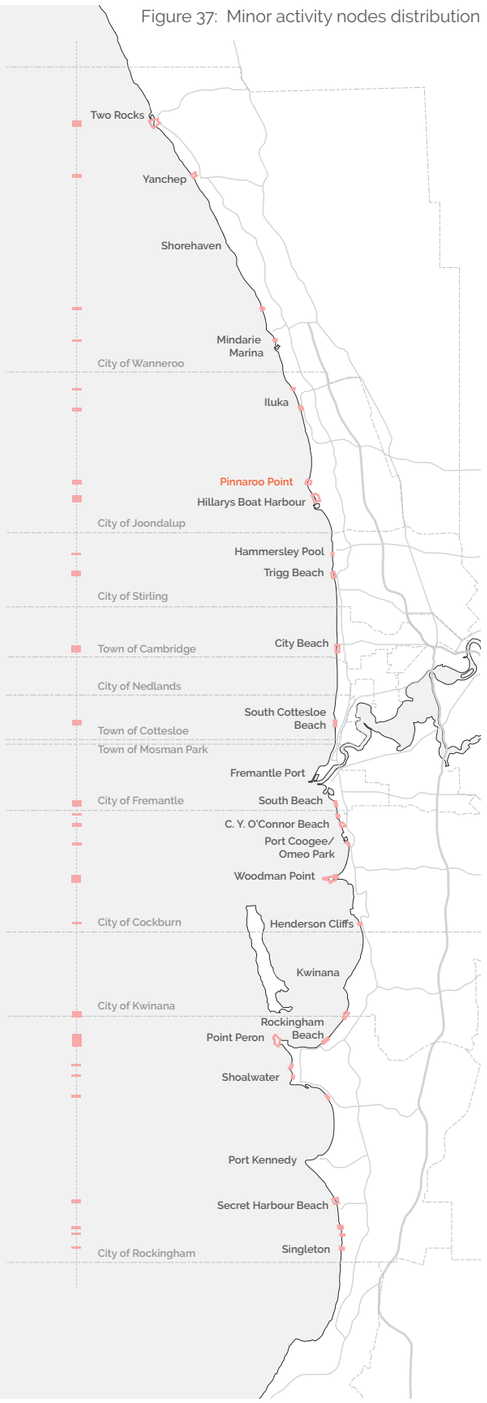


Figure 38: Pinnaroo Point Uses and Infrastructure

Legend

- Playground
- Covered picnic tables
- Public toilets
- Bike racks
- Car parking
- Kite/wind surfing
- Shared use path

Example: Pinnaroo Point, Hillarys

Pinnaroo Point represents a typical example of a minor activity node. The main use of the node is still for beach and water based-recreation, with Pinnaroo identified as a kite and windsurfing location with large parking spaces and vehicular beach access (Figure 35). However, it also provides limited park-based recreational opportunities through a standard playground and picnic facilities (Figure 36), although has no larger commercial or community infrastructure. As shown in Figure 38, the overall scale of development also does not prevent a considerable conservation area between the node and the beach.

Moderate Activity Nodes

Moderate activity nodes are also distributed relatively consistently, which reflects the common occurrence of SLS clubs and commercial facilities – particularly cafes – at Perth's most popular beaches (Figure 41). Many moderate activity nodes are differentiated from minor activity nodes simply through the presence of a single cafe, either within the node (Figure 39) or adjacent to it – as is typical along the northern part of the Stirling coastline.

Figure 39: Brighton Beach has a development footprint similar to a minor activity node, but with the addition of a small café.

Figure 40: As well as the presence of a SLS club, development at Sorrento extends right up to the beach, leaving little remnant vegetation.

Figure 41: Moderate activity nodes distribution

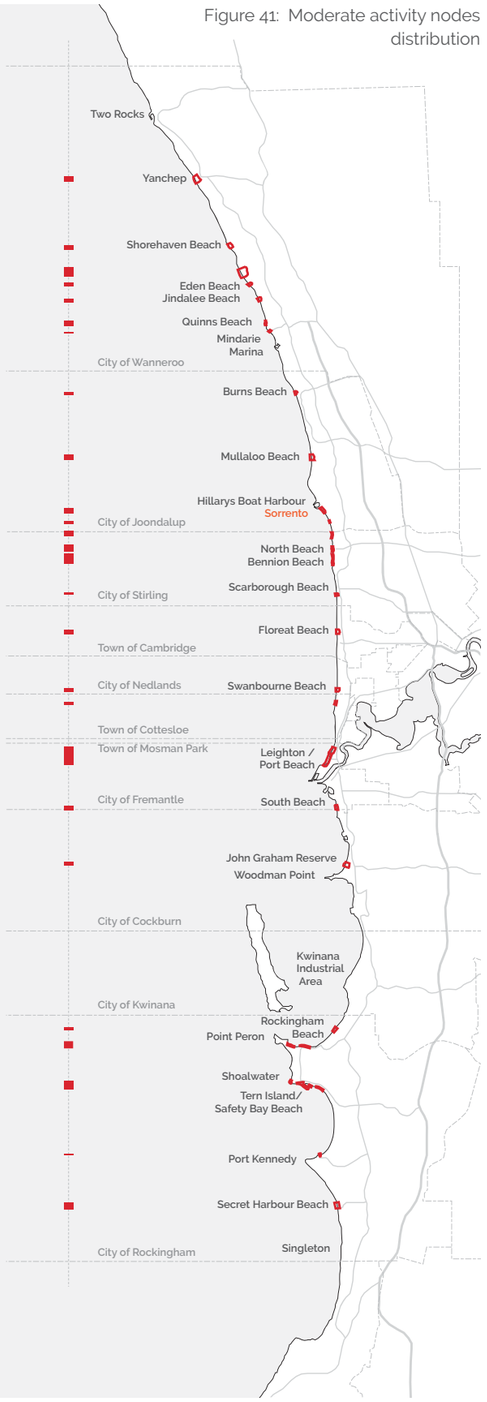
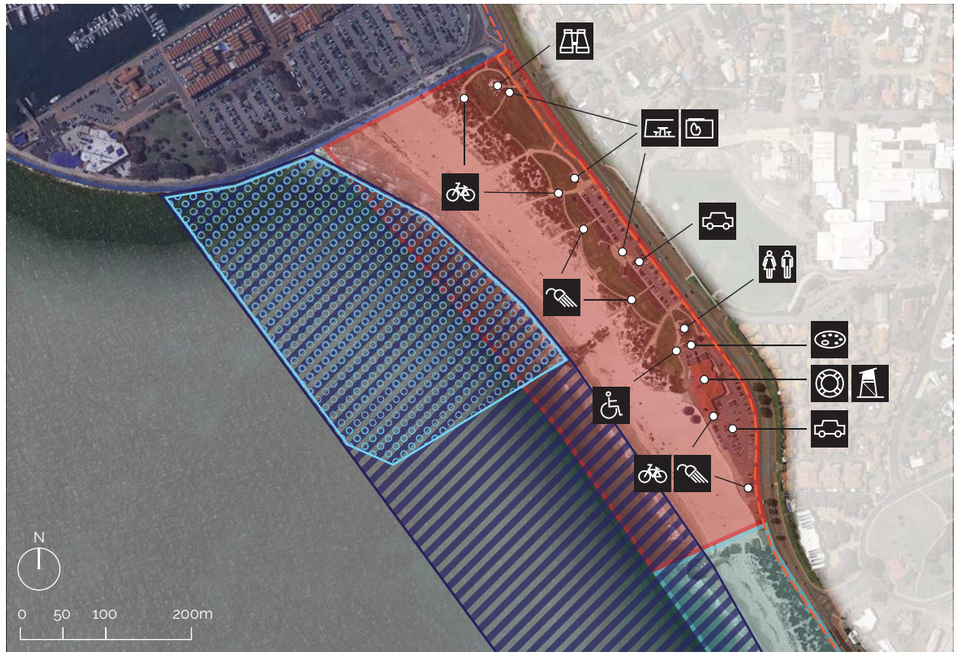


Figure 42: Sorrento Uses and Infrastructure



Legend

- Showers
- Bike racks
- Surf Life Saving (SLS) club
- Enclosed swimming area
- Covered picnic tables
- Car parking
- SLS observation tower
- Kite surfing exclusion zone
- BBQs
- Lookout
- Public artwork
- Shared use path

Example: Sorrento

Sorrento is provided to illustrate a node at the top-end of the moderate activity scale. It has an extensive development footprint, and includes a large and popular SLS club (Figure 40), high use for general water-based recreation including a protected swimming area, and extensive parking facilities to cater for this district-level use. As a result, the conservation area is largely non-existent (Figure 42). There is however limited potential for park-based active recreation, and it lacks key infrastructure such as commercial/restaurant amenities and unique tourism attractions that are typical of a major activity node.

Major Activity Nodes

Seven major activity nodes were identified in the study area, centrally located north and south of the river between Trigg and Coogee, with the exception of Rockingham Beach (Figure 45). Aside from an increased development footprint, the main distinguisher of these nodes is the presence of significant and unique recreational opportunities – typically commercial – that are likely to be used for tourism.

Figure 43: Typical of major activity nodes, development at Cottesloe Beach is significant along the node, including a commercial premises within the node.

Figure 44: Special events likely to attract tourist use is a key criterion for major activity nodes.

Figure 45: Major activity nodes distribution

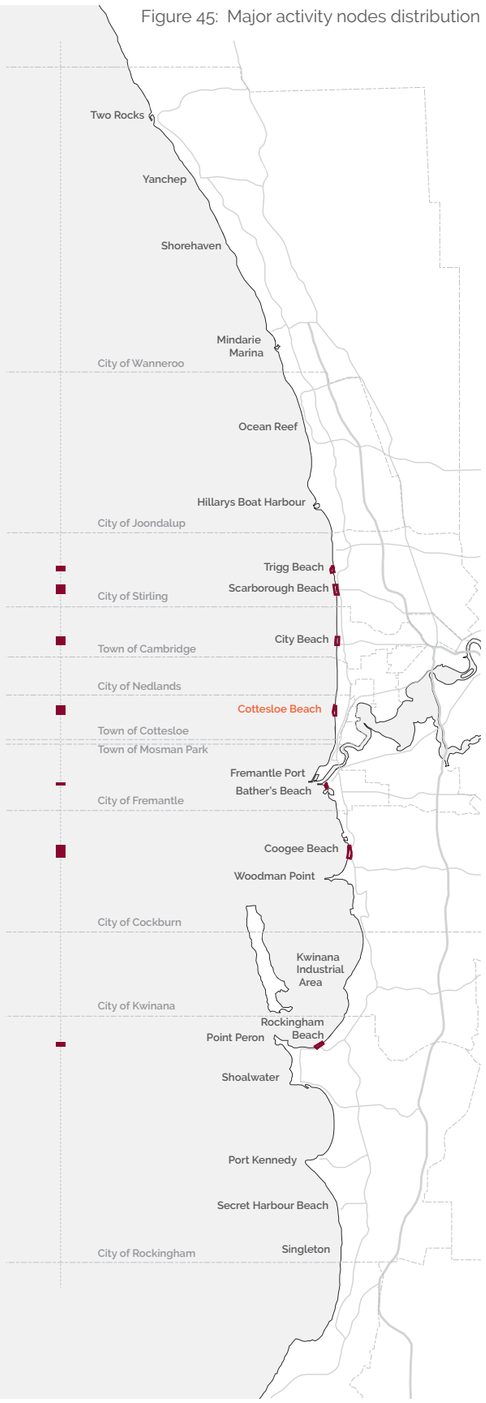
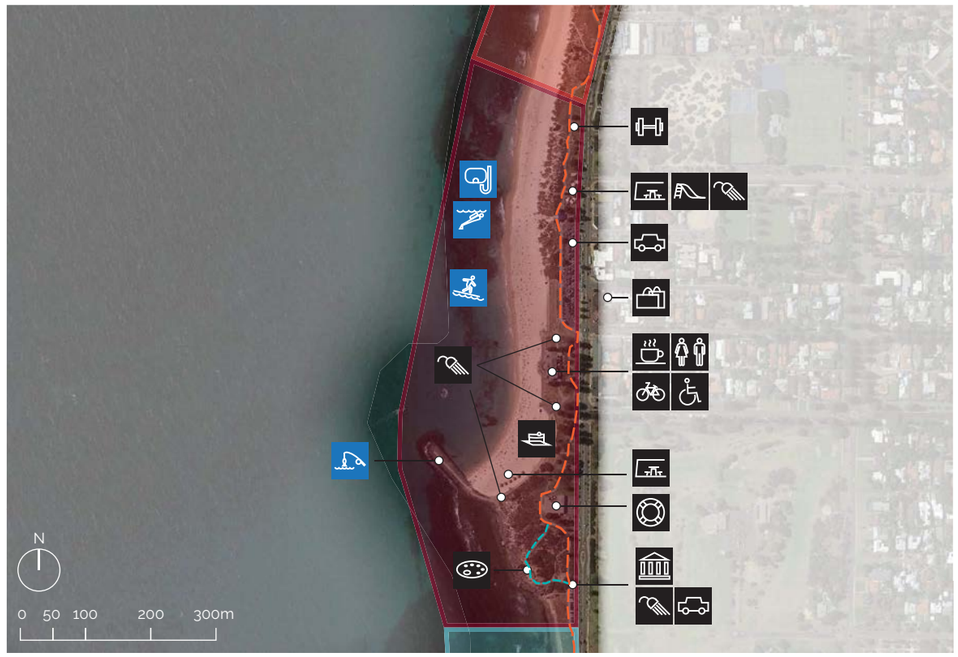


Figure 46: Cottesloe Uses and Infrastructure



Legend

- Showers
- Covered picnic tables
- Public toilets
- Bike racks
- Car parking
- Playground
- Fitness equipment
- Surf Life Saving (SLS) club
- Cafe
- Shopping area
- Public artwork
- Cultural heritage site
- Beach volleyball
- Diving
- Snorkeling
- Fishing
- Surfing
- Shared use path
- Walking path

Example: Cottesloe

Cottesloe is given as a major activity node example. It has extensive development along the node that eliminates the foreshore reserve, and provides a variety of park-based recreation opportunities (Figure 46). As well as extensive use for general and specialist water-based recreation, it has range of commercial premises such as the Indiana Tearooms (Figure 43) and the adjacent Cottesloe Beach Hotel. In addition to this is its use for special events such as Sculptures by the Sea (Figure 44) that make it a notable tourist attraction.

Boat Harbour Nodes

Eight boat harbours were identified in the study area (Figure 49), including five marinas. These nodes are characterised by artificial enclosures that enables mainly boat launching (Figure 50) but also other forms of specialist water-based recreation such as kayaking and SUP boarding (Figure 47). Marinas are those harbours that have boat mooring as an additional use, and also include some degree of commercial development.

Figure 47: The protected waters of marinas such as Hillarys are ideal for kayaking and similar water-based uses.

Figure 48: The parkland, protected beach and large commercial area at Hillarys Boat Harbour make it a major activity node in its own right.

Figure 49: Boat harbour nodes distribution

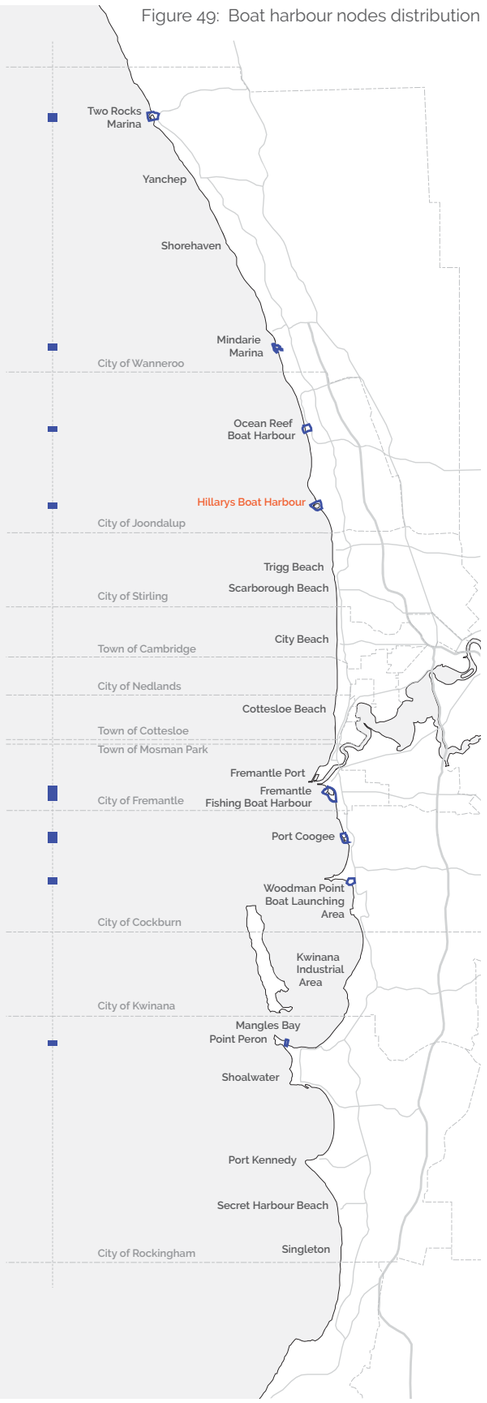
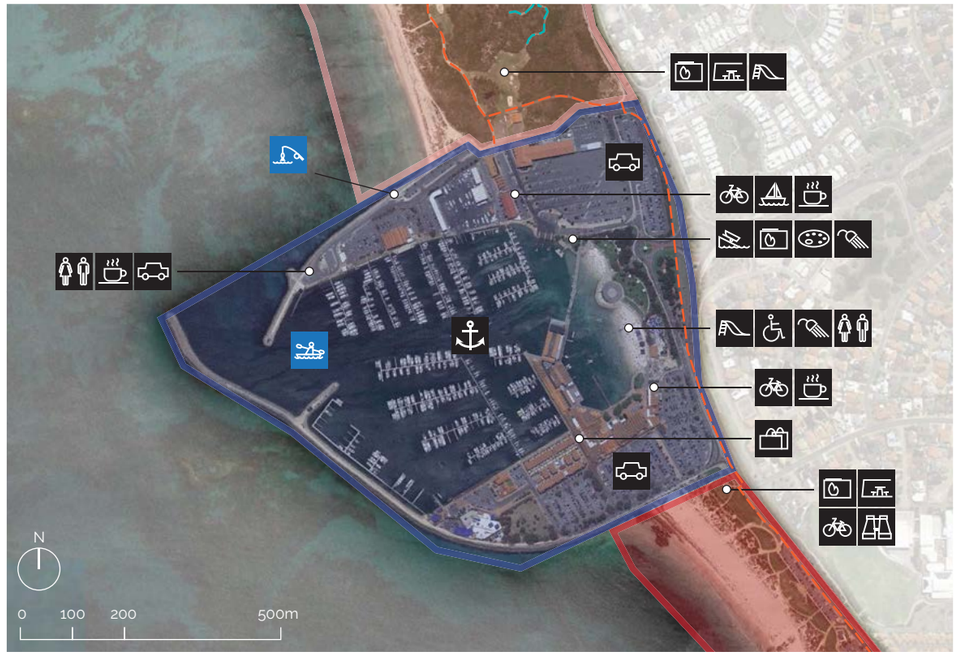


Figure 50: Hillarys Boat Harbour Uses and Infrastructure



Legend

- Showers
- Covered picnic tables
- BBQs
- Public toilets
- Bike racks
- Car parking
- Universal beach access
- Playground
- Cafe
- Shopping area
- Boat mooring
- Boat ramp
- Water sports club
- Lookout
- Public artwork
- Fishing
- Kayaking/canoeing/ stand up paddle boarding
- Shared use path
- Walking path

Example: Hillarys Boat Harbour

Hillarys Boat Harbour is the marina with the highest level of recreational infrastructure and variety of use in the study area, and essentially represents a boat harbour and major activity node combined. It has a protected swimming beach with adjacent play and picnic facilities, significant commercial development in the form of a shopping and restaurant precinct, as well as other unique tourist attractions (Figure 48). The other four marinas, ranging from Fremantle Harbour at a larger scale to Mindarie, Port Coogee and finally Two Rocks at a smaller scale, have some but not all of these features.

Ports

Only Fremantle Port was classified under this type of node (Figure 53 and 54). While being similar to a boat harbour node in providing a protected area for boats to launch and dock, it is provided at a far large scale. It is also heavily weighted towards industrial rather than recreational use, with commercial premises generally not linked to recreational opportunities.

Figure 51: The main use of ports is for non-recreational purposes such as ship docking.

Figure 52: Some areas of Fremantle Port, such as the north mole, are publically accessible and highly valued for fishing.

Figure 53: Ports distribution

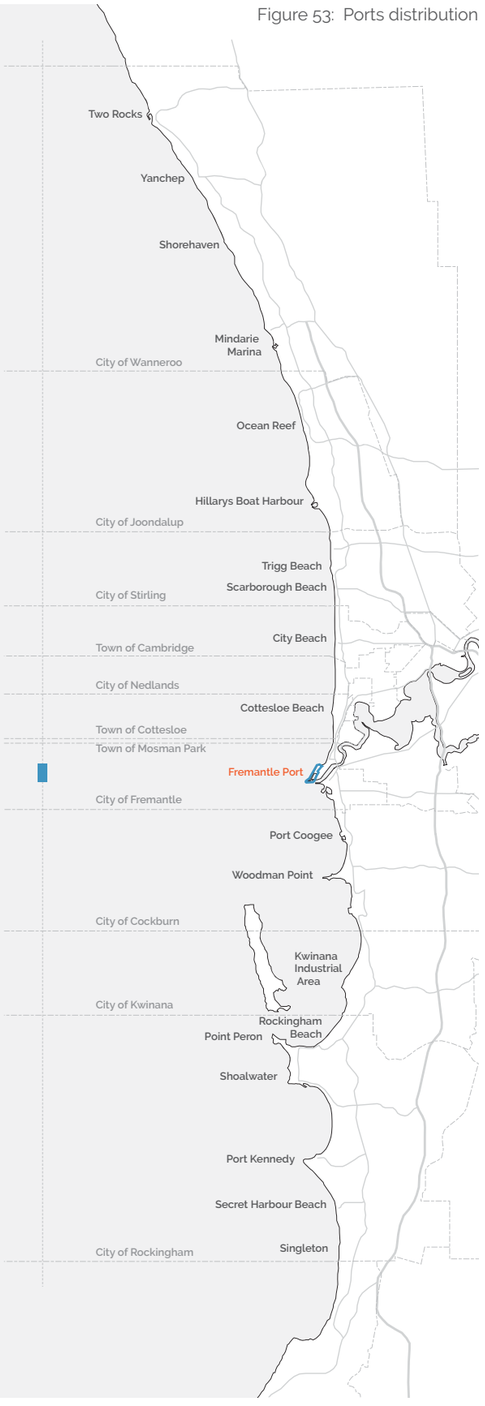


Figure 54: Fremantle Port Uses and Infrastructure

Legend

- Showers
- Public toilets
- Bike racks
- Car parking
- Cafe
- Lookout
- Natural attraction
- Fishing
- Surfing
- Shared use path

Example: Fremantle Port

While predominantly for industrial and heavy commercial purposes (Figure 51), Fremantle Port does provide some recreational opportunities. In the case of the south mole and adjacent area, infrastructure previously for industrial use has been transformed into a recreational and tourism precinct. Most notable however is the use of the north mole for fishing (Figure 52).

Industrial Areas

Industrial areas are limited in the study area to four sites (Figure 57), including a small industrial jetty in Woodman Point, the main sites at Henderson and Kwinana (Figure 58), and the Kwinana Grain Terminal and jetty directly south. Typical beach recreation is restricted due to industrial infrastructure (Figure 55), with some exceptions.

Figure 55: Much of the beach along the main Kwinana Industrial area is blocked off to public use.

Figure 56: A range of users are permitted adjacent to the Grain Terminal, including access underneath the jetty.

Figure 57: Industrial areas distribution

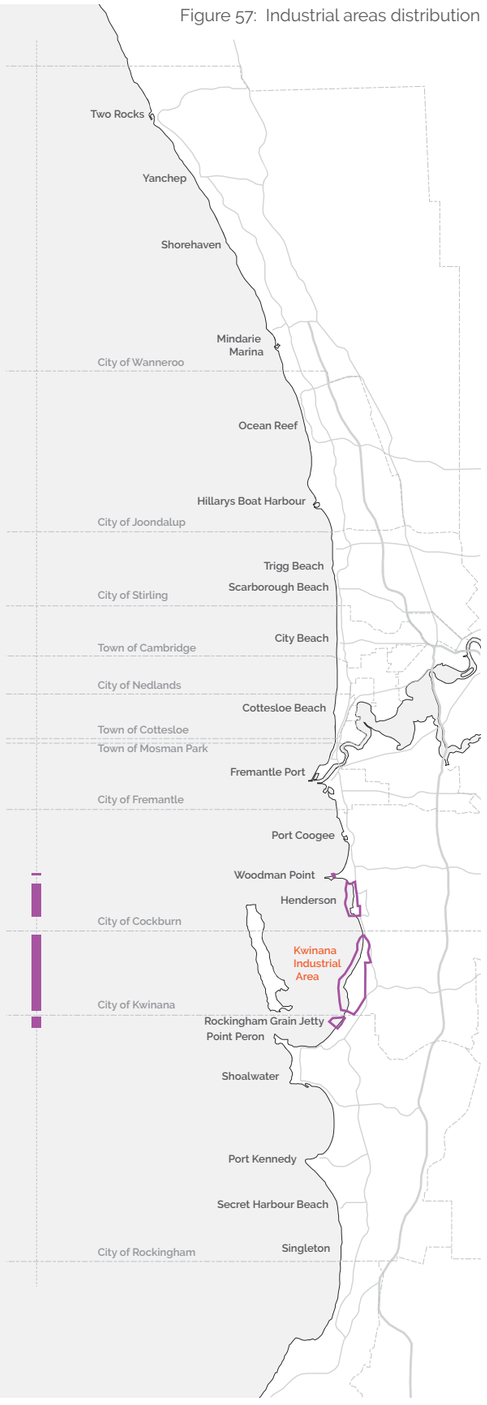


Figure 58: Kwinana Industrial area Uses and Infrastructure

Legend

- Covered picnic tables
- Playground
- Boat ramp
- BBQs
- Lookout
- Public toilets
- Car parking

Example: Kwinana Industrial area

The industrial areas at Kwinana are examples of nodes that permit limited recreation at the beach. Users accessing the beach from the north and south can still use it for general water-based and beach activities, while there are also some access points within the industrial area. One such portion of the beach has been used as a horse exercise area, although this use is likely to be discontinued. Further south, the beach adjacent to the Kwinana Grain Terminal has largely unrestricted use (Figure 56), including for dog and horse exercise.

Wild Connectors

Wild connectors are located primarily on the outer edges of the study area (Figure 61) – notably within the City of Wanneroo, although many of these connectors will soon be subject to adjacent residential development that will likely change their classification. Wild connectors mainly include foreshore stretches that exist between established residential areas (for example Two Rocks and Yanchep, Yanchep and Alkimos) as well as formally designated conservation reserves (Tamala Park, Scientific Park).

Figure 59: Beaches adjacent to wild connectors are generally accessible, although often through informal beach access paths and prohibited means such as 4WD.

Figure 60: In other locations such as Tamala Park, formal paths may be provided to facilitate nature and wilderness experiences.

Figure 61: Wild connectors distribution

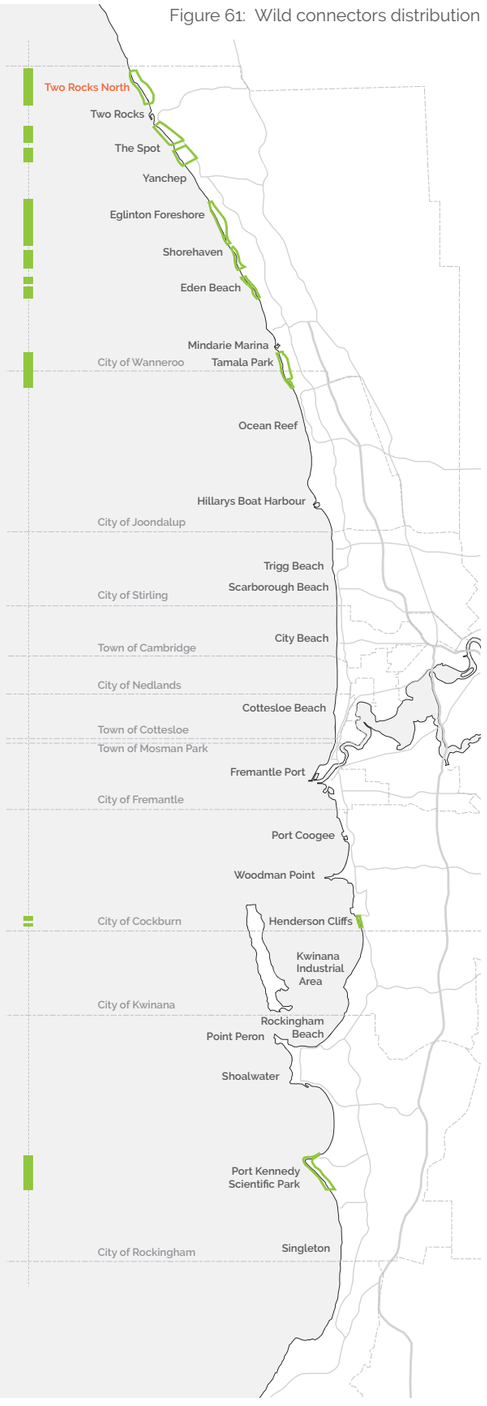


Figure 62: Two Rocks North Uses and Infrastructure

Legend

Showers

Example: Two Rocks North

The foreshore north of Two Rocks is given as an example of a wild connector (Figure 62). It contains no formal infrastructure or beach access paths, however contains numerous informal paths that are used to access the beach (Figure 59). It is also a popular surfing spot for experienced surfers, although is not mapped as such given much of this access is prohibited. Other wild connectors (see example in Figure 60) may have some formal walking and beach access paths.

Dune Path Connectors

Dune path connectors are the dominant coastal land use in the study area, and particularly prevalent within the Cities of Wanneroo, Joondalup and Rockingham (Figure 65). The main characteristic of these connectors is a generally unbroken shared-use path running from north to south, along with regular beach access paths running from east to west.

Figure 63: Along with active recreational use, interpretive signage is provided at key locations to enable education of environmental and cultural values.

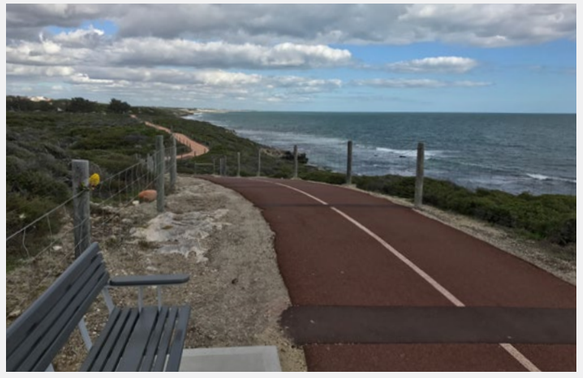


Figure 64: Seating is also provided at raised vantage points to encourage aesthetic appreciation of the landscape.

Figure 65: Dune path connectors distribution

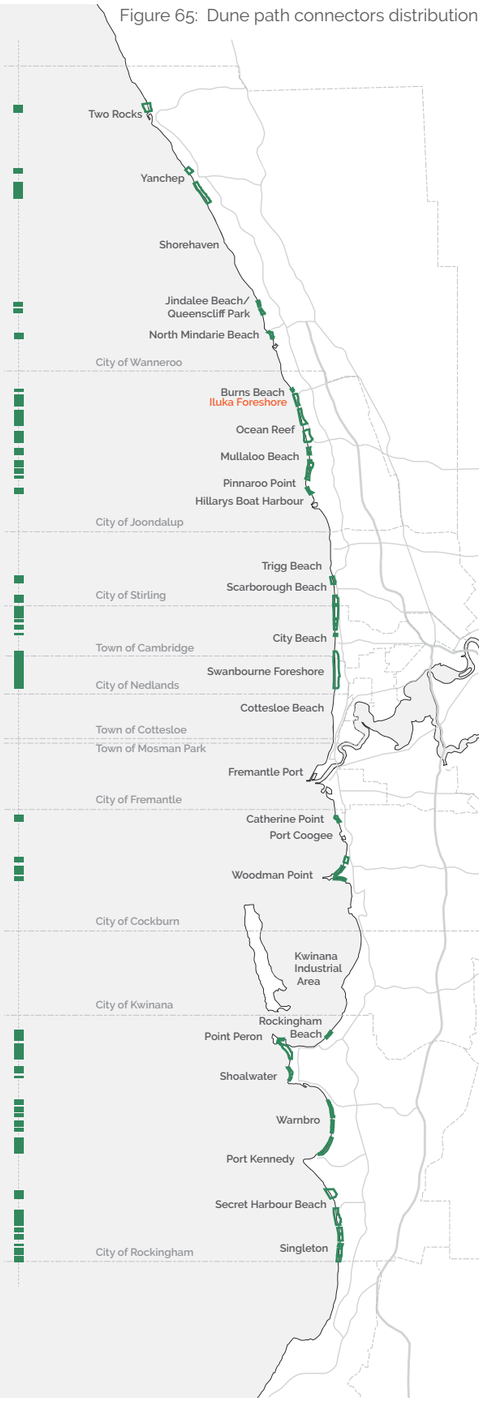


Figure 66: Iluka Foreshore Uses and Infrastructure

Legend

- Showers
- Bike racks
- Playground
- Community centre
- Covered picnic tables
- Car parking
- Lookout
- Fishing
- BBQs
- Public toilets
- Cafe

Example: Iluka Foreshore

Iluka Foreshore is a typical example of a dune path connector (Figure 66). The shared path links the nodes at Burns Beach and Iluka Beach, and is also used for active recreation of various types and intensities. The path passes through high quality vegetation with associated educational signage (Figure 63), while providing multiple lookout points that enhance the aesthetic and nature experiences of the landscape (Figure 64).

Urban Connectors

Urban connectors are less common than dune path connectors, and are focused mainly around highly developed coastal areas in Quinns Rocks; Hillarys to Trigg; Cottesloe; and Shoalwater to Safety Bay (Figure 69). The natural foreshore reserve is reduced along these connectors, with a greater degree of infrastructure provide adjacent to short beach access paths.

Figure 67: Shared paths continue to encourage active recreation between nodes, while additional infrastructure enable water-based and beach use.

Figure 68: South Cottesloe in particular is a connector that is well used for specialist water-based recreation.

Figure 69: Urban connectors distribution

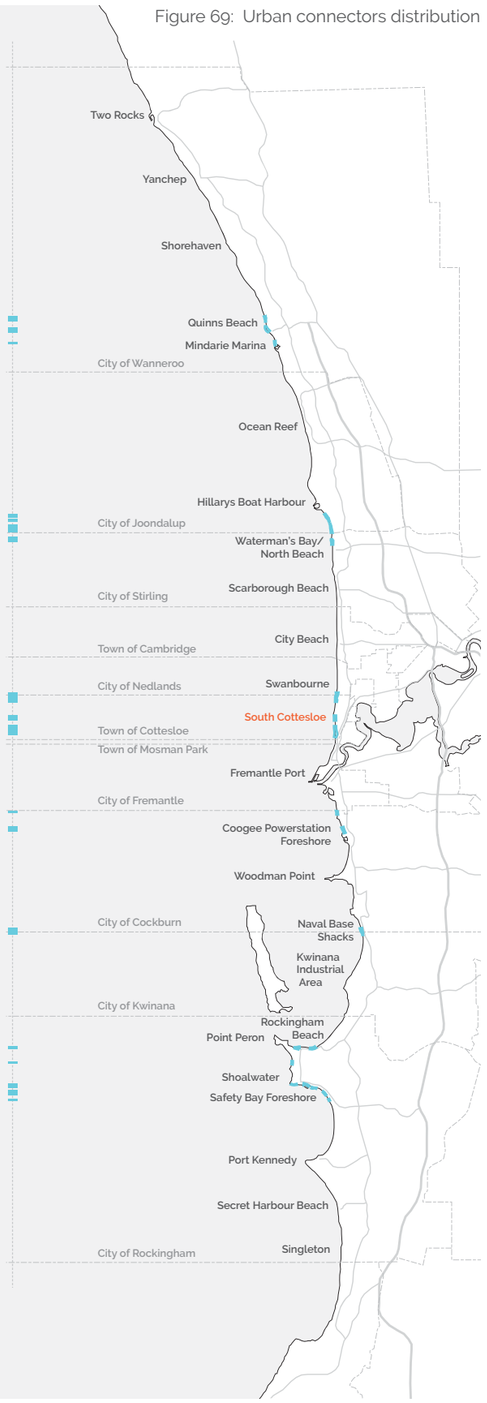
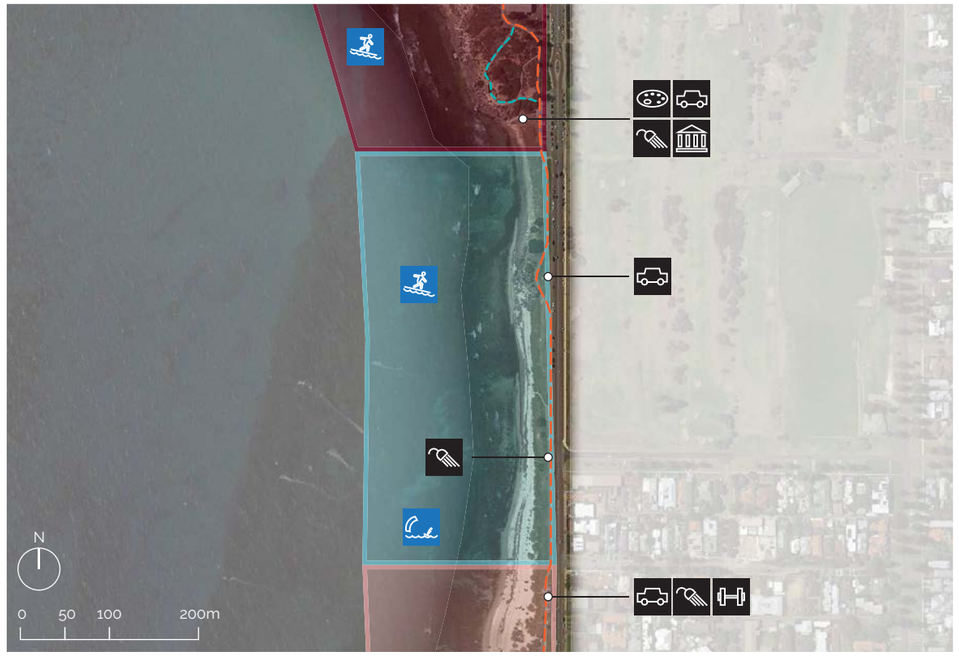


Figure 70: South Cottesloe Uses and Infrastructure



Legend

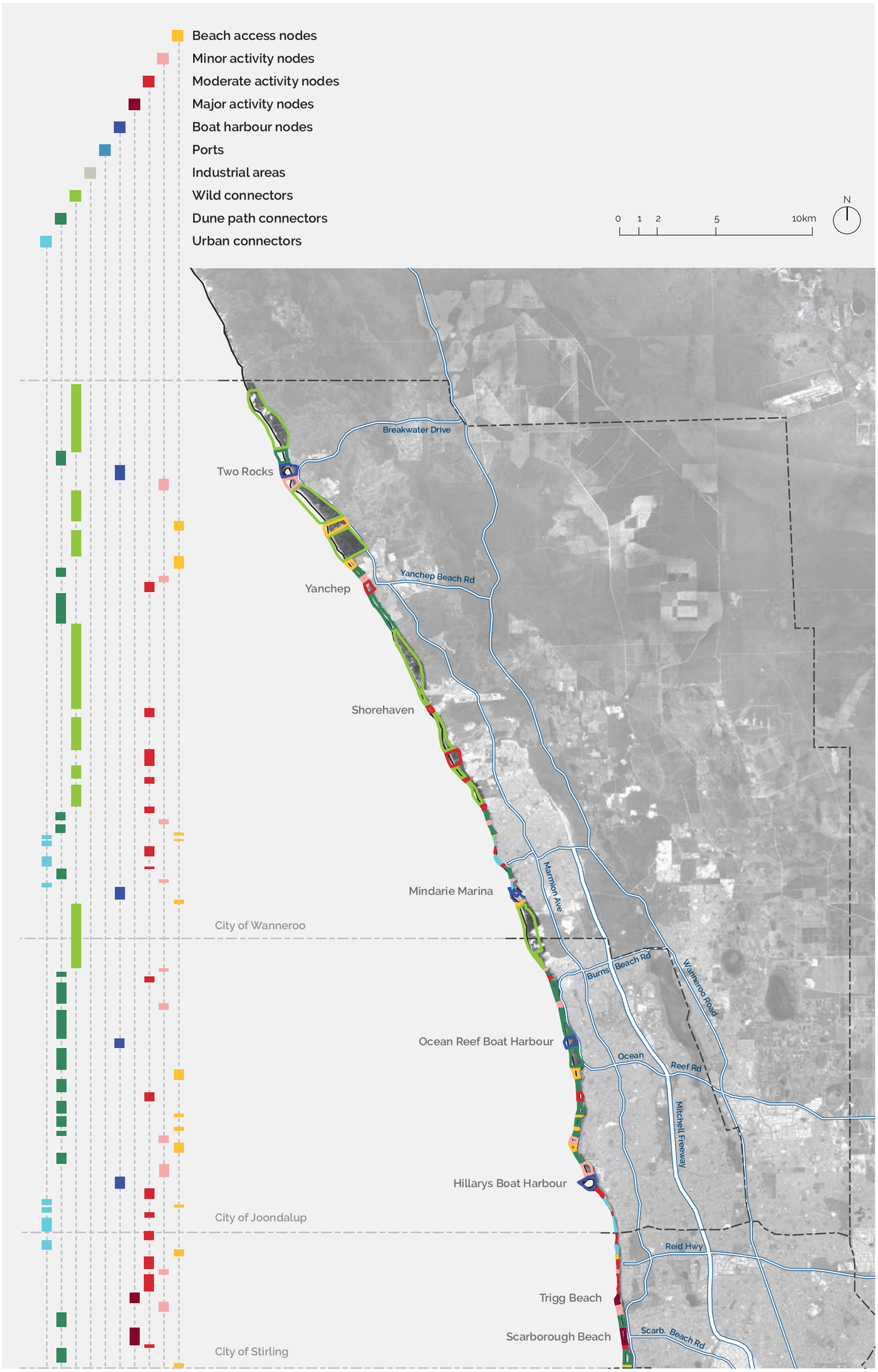
- Showers
- Fitness equipment
- Cultural heritage site
- Surfing
- Car parking
- Public artwork
- Kite/wind surfing

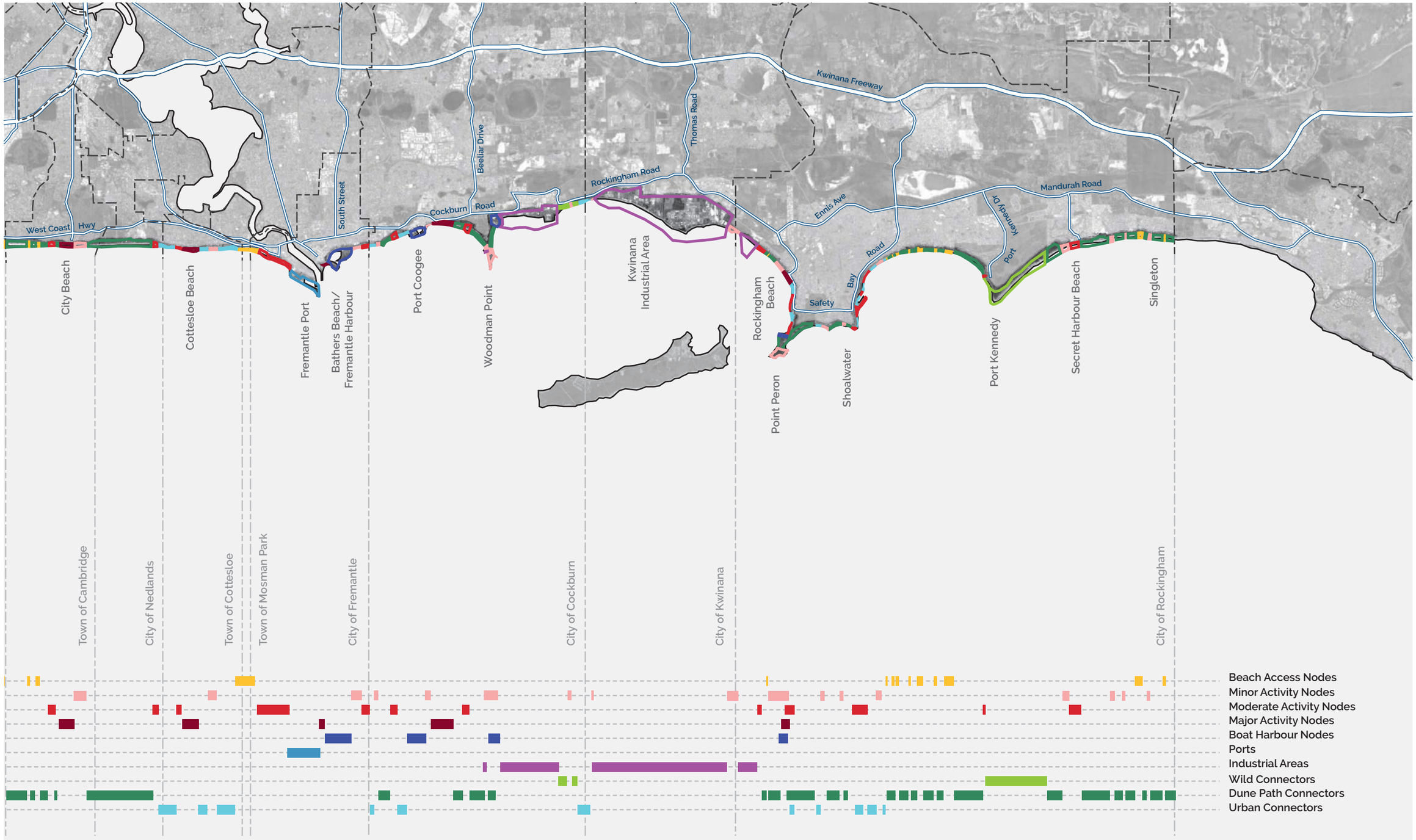
Example: South Cottesloe

South Cottesloe Foreshore is a notable example of an urban connector (Figure 70). Shared paths still run through the connector, but are directly adjacent to the residential area with little remaining foreshore reserve, and provide limited additional recreational experiences. The presence of infrastructure such as showers and street parking (Figure 67), along with small grassed areas and short beach access paths, help service several popular surfing spots (Figure 68).

Figure 71:

Coastal Recreational Use Classification - Distribution Map




Kwinana Freeway
Rockingham Road
Mandurah Road
West Coast Hwy
Cockburn Road
South Street
Beeliar Drive
Thomas Road
Ennis Ave
Kennedy Dr
Safety Bay Road
City Beach
Cottesloe Beach
Fremantle Port
Bathers Beach/ Fremantle Harbour
Port Coogee
Woodman Point
Kwinana Industrial Area
Rockingham Beach
Point Peron
Shoalwater
Port Kennedy
Secret Harbour Beach
Singleton
Town of Cambridge
City of Nedlands
Town of Cottesloe
Town of Mosman Park
City of Fremantle
City of Cockburn
City of Kwinana
City of Rockingham
Beach Access Nodes
Minor Activity Nodes
Moderate Activity Nodes
Major Activity Nodes
Boat Harbour Nodes
Ports
Industrial Areas
Wild Connectors
Dune Path Connectors
Urban Connectors

Significance, Discussion and Future Considerations

The aim of this study was to develop a means of capturing a baseline of coastal recreational use. The Coastal Recreational Use Audit Tool and the subsequent Coastal Recreational Use Classification Framework were developed and applied to provide a descriptive analysis of the distribution of different recreational infrastructure, use locations and use areas along the study area coastline – Two Rocks to Singleton Beach.

The maps on the preceding pages show clear patterns in individual audit criteria, nodes and connectors across the study area. This rich mix of environments and infrastructure (as illustrated in the descriptions, photographs and further detail in Part B of this report) are integral to maintaining the many facets of recreational use that embrace the complex mix of variables underpinning human motivation to seek out the coast for recreational purposes.

The maps and accompanying information can form the basis for future planning discussions and decisions relating to coastal recreational use. In particular, the final combined map of all coastal classifications can form the starting point for a holistic understanding of the recreational use of the coast and may inform future scenario mapping exercises.

Whilst local area coastal custodianship and decision making lies largely with individual local governments (LGs), this report encourages all coastal stakeholders to adopt the view that the coast, as illustrated in the preceding Coastal Recreational Use Distribution Map (Figure 71), is one continuous recreational asset and, as such, any decision made at a local level will likely have a flow on effect up and down the coast.

While the aim of this study was not to provide a critical analysis of coastal planning and policy implications, there were nonetheless some broader planning issues identified during the process that warrant further discussion.

One key finding, and which supported the rationale for the study itself, was inconsistency across LGs and other stakeholders in the designation of specific recreational uses. Along the Cottesloe coastline, for example, major surfing spots are clearly signed and named, however such designation is rare in other LG areas. Similarly, the City of Joondalup clearly identifies exclusion and designated areas for kite surfing, both at the beach and on its website, however it is the only LG to do so consistently. It is hoped that this study can be a first and significant step in providing a framework for the consistent and universal mapping of recreational uses along the Perth (and ultimately Western Australian) coast.

Different interpretations were also found between stakeholders as to where particular uses might be accepted or discouraged. One example was noted in the discussion of specialist water-based use, where a popular surfing spot is acknowledged both by the community and the relevant state sporting organisation, however discouraged, for safety reasons, by the relevant LG. From a planning perspective, this disconnect between users of the coast and those responsible for this use is potentially problematic.

Another example relates to fishing. As noted, recreational fishing can occur along virtually the entire extent of the study area, however, may be particularly common in certain locations. One of these is on rocky outcrops such as groynes, which were regularly observed as recreational fishing locations during site visits. Noting the popularity of these areas for recreational fishing, Recfishwest provides specific safety advice on its website for rock fishing. Yet, conversely, one relevant LG provided strong advice that such areas should not be identified as fishing locations due to safety issues.

While this study has focussed specifically on recreational uses of the coast, such uses are inextricably linked to other coastal functions and broader planning issues - these include economic and population pressures through encroaching urban development, and environmental pressures such as the effects of climate change and coastal erosion. Singularly and in combination, these issues have the the potential to significantly impact the extent of the coast that is available for recreational use across the classification spectrum. Future recreational mapping of the coast should better consider how physical changes to the coast will likely impact recreational use - most specifically the knock-on effect resulting from events occurring within the continuous chain that constitutes Perth's coastal environment.

Finally, there remains a need to expand the study in order to provide a more accurate and complete picture of recreational use across the state of Western Australia. The next stages proposed from this study are:

Stage 2 – Extension

- Extend the study area to include the Peel region and other major regional locations.
- Develop and implement a plan to a) update map content, and b) repeat the audit at regular (2 yearly) intervals to capture change over time.

Stage 3 – Expansion

Expand the audit and update maps to include:

- More detailed mapping of universal beach access infrastructure and services: including differentiation between different features such as ramps, mats and wheelchair hire; along with consideration of the availability and appropriateness of ACROD parking spaces.
- More comprehensive mapping of sites with significant cultural heritage value (particularly Indigenous heritage) extending beyond instances of physical signage and memorials and ideally involving a process of consultation with relevant stakeholder groups.

Stage 4 – Adaptation

- Adapt the audit to build upon the existing Department of Transport Boating Guide for the Swan and Canning Riverpark and broaden the recreational use context of river and estuary areas. (https://www.transport.wa.gov.au/mediaFiles/marine/MAC_G_Boating_SwanCanningRiver.pdf).

This concludes Part A of the report. Part B is intended as a resource comprising Detailed Coastal Recreational Use Maps with descriptions, observations and illustrations.

References and Supporting Documents

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Supporting Documents

City of Cockburn

Coastal Activities Guide 2016

Cockburn Coast District Structure Plan

Town Of Cottesloe

Beach Policy 2012

Beaches and Beach Reserves Local Law 2012

Cottesloe Foreshore Renewal Masterplan

City of Joondalup

Beach Management Plan 2011-2016

Marmion Coastal Foreshore Reserve Management Plan 2015

City of Rockingham

Rockingham Beach Foreshore Master Plan

City of Stirling

Coastal Foreshore Action Plan 2006

City of Wanneroo

Coastal Management Plan 2012

Quinns Beach Long Term Coastal Management Plan 2015

Department of Planning and Infrastructure

Perth Recreational Boating Facilities Guide 2008

Department of Environment and Conservation

Shoalwater Islands Marine Park Management Plan 2007-2017

Academic Research

Eliot, Tonts, Eliot, Walsh and Collins (2005). *Recreational Beach Users in the Perth Metropolitan Area.* University of Western Australia. Perth, Western Australia.