SYRINX Seashore Engineering

GOVERNMENT OF WESTERN AUSTRALIA
Department of Biodiversity, Conservation and Attractions

City of Melville

City of Melville

FORESHORE MANAGEMENT PLAN

October 2025

For City of Melville

SYRINX

Document Control

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ACKNOWLEDGEMENT OF COUNTRY

The City of Melville acknowledges the Bibbulmun people as the Traditional Owners of the land on which the City stands today and pays its respects to the Whadjuk people, and Elders both past and present.

City of Melville nagolik Bibbulmen Nyungar ally-maga milgebar gardukung naga boordjar-il narnga allidja yugow yeye wer ali kaanya Whadjack Nyungar wer netingar quadja wer burdik.

Marie Taylor Whadjuk Ballardong Nyungar Birdiyia

USAGE OF DUAL NAMING IN THIS DOCUMENT

The City of Melville acknowledges the Whadjuk Noongar Place Names used in this report have been identified by Noongar Elders and knowledge holders through the Place Names Melville project, which seeks to reveal and share the cultural significance of Noongar Boodja. These names are included for cultural recognition purposes only and have not yet been registered as official names through government processes.

ACKNOWLEDGEMENT OF THE CLIMATE EMERGENCY

The City of Melville acknowledges the climate emergency and is committed to achieving carbon neutrality as an organisation by 2030 and net zero across our City by 2050 to combat climate change.

This document was prepared by the Syrinx Environmental and Seashore Engineering teams, with input from the City of Melville, DBCA, the community members who participated in the online survey for the Foreshore Strategy Review and those who tirelessly volunteer their time to maintain and improve the foreshore environs. Thank you.

The majority of the contextual information used in this document was based on the existing information provided by the City of Melville, including foreshore vegetation condition (NAMS, 2024) and aquatic assets (MP Rogers, 2024) assessments, management plans and strategies, as well as the City's Cultural Heritage and Reconciliation Action Plans. Place names were taken from the Doontanboro Kura Melville Waters Dreaming project outputs.

Recommended Citation

City of Melville (2025) City of Melville Foreshore Management Plan. Report by Syrinx Environmental and Seashore Engineering. September 2025, Perth, Western Australia.

TERMS AND ACRONYMS

The following terms and acronyms are used in this management plan.

Abbreviation or acronym	What it stands for
AACFMP	Attadale Alfred Cove Foreshore Masterplan
ASS	Acid Sulfate Soils
BC Act	*Biodiversity and Conservation Act 2016*
BEAG	Bicton Environmental Action Group
CoM	City of Melville
DBCA	Department of Biodiversity, Conservation and Attractions
DBH	Diameter at breast-height
DEC	Department of Environment and Conservation (now DBCA)
DER	Department of Environment and Regulation (now DWER)
DPaW	Department of Parks and Wildlife (now DBCA)
DoT	Department of Transport
DWER	Department of Water and Environmental Regulation
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
ERMP	Estuarine Reserve Management Plan
FAPS	Foreshore Asset Protection Strategy
FMBS	Friends of Melville Bird Sanctuary
FO Applecross FS	Friends of Applecross Foreshore
FRS	Foreshore Restoration Strategy
GSC	Geotextile Sand Container
GDE	Groundwater Dependent Vegetation
IPCC	Intergovernmental Panel on Climate Change
MBS	Melville Bird Sanctuary
NAAMP	Natural Areas Asset Management Plan
RPS	River Protection Strategy
SERAG	Swan Estuary Reserves Action Group
WALGA	Western Australian Local Government Association

EXECUTIVE SUMMARY

The City of Melville Foreshore Restoration Plan 2025 provides a comprehensive five-year framework (2025–2030) for the protection, restoration, and sustainable management of the City's foreshore along the Swan and Canning Rivers (Derbarl Yerrigan and Djarlgarro Beeliar). The Plan consolidates previous strategies and assessments and recent assessments to guide management actions over the next five years (2025–2030).

The FMP identifies the principal pressures affecting foreshore condition including erosion, vegetation decline, climate change, recreational impacts, and ageing infrastructure and outlines practical, prioritised actions to enhance ecological resilience and community amenity. It promotes the use of nature-based and bioengineered solutions where feasible, while recognising that engineered protection remains necessary in constrained or high-risk areas.

Following a collaborative workshop with the City of Melville and the Department of Biodiversity, Conservation and Attractions (DBCA), five Priority 1 sites were identified as the highest priorities for restoration during the 2025–2030 period. These were selected based on the extent of existing damage, threats to infrastructure, ecological value, and public safety.

The five priority sites are:

- **Coffee Point Reserve** – Active erosion adjacent to the pathway requires revetment extension, regrading, brushwalling, and revegetation.
- **Canning Road Foreshore** – A complex site constrained by narrow buffers, steep embankments, and nearby infrastructure (roads, pathways, and Water Corporation assets). Interim revetment repairs and localised revegetation are recommended while long-term adaptive options are investigated.
- **The Esplanade Foreshore** (north and south of Deep Water Point) – Corridor width, underground services, and adjacent infrastructure limit large-scale restoration. A coordinated, strategic planning approach is required to develop a climate-resilient design integrating road, drainage, and foreshore upgrades. In the interim focal restoration of erosion sites is recommended alongside maintaining and repairing existing structures.
- **Jeff Joseph Reserve** – Low-lying foreshore requiring buffer widening and sedge belt establishment to improve stability and flood resilience. Brushwalling and staged revegetation are recommended to enable natural shoreline recovery.
- **Majestic Point Beach** – Narrow sandy foreshore suitable for targeted revegetation and low-impact restoration to improve stability and ecological function.

The inclusion of Canning Road and The Esplanade foreshores highlights the need for strategic, cross-agency planning in narrow and high-value corridors where habitat-style restoration is not feasible. These sites will require careful coordination between the City, DBCA, utility providers, and the

community to deliver hybrid and adaptive solutions that protect assets, enhance amenity, and support long-term climate resilience.

Implementation of the FMP will be achieved through a whole-of-City approach. Responsibilities for delivery, monitoring, and review are shared across multiple business units including Natural Areas, Engineering, Parks and Environment, and Community Development supported by DBCA, community groups, and volunteers.

Annual progress reviews and a formal five-year review in 2030 will ensure the Plan remains adaptive, transparent, and aligned with the Council Plan for the Future (2024–2034), Community Climate Action Plan (2024–2030), and Urban Forest Strategy (2024).

The Foreshore Restoration Plan 2025 represents a significant evolution in how the City of Melville manages its riverine environments. It delivers an evidence-based, culturally informed, and community-driven roadmap to enhance foreshore resilience, protect biodiversity, and ensure the City's treasured riverscapes remain vibrant, accessible, and sustainable for generations to come.

INTRODUCTION

The City of Melville's parks, natural areas, and green spaces located on Whadjuk Noongar Country are among the City's most iconic and valued landscapes. These areas are essential for community health and wellbeing, support rich biodiversity and hold deep cultural and historical significance.

Stretching across an 18-kilometre corridor along the banks of the Swan and Canning Rivers (Derbarl Yerrigan and Djarlgarro Beeliar), the City's foreshore forms a contiguous green link that is part of the regional Swan Canning Riverpark and the Doontanboro Kura | Melville Waters Dreaming. The foreshore area offers sweeping river views, peaceful recreation spaces, natural cooling and flood protection and is home to conservation significant species and ecological communities (e.g. conservation significant salt marshes and migratory bird habitats). The area also supports significant infrastructure, including roads, pathways, sporting fields and watercraft access areas, which provide essential community services.

The many benefits provided by the foreshore are increasingly under threat from erosion, development, recreational pressures, weed invasion, water pollution and the impacts of climate change. These threats have created a need for a coordinated long term management approach to safeguard this essential landscape.

This Foreshore Management Plan (FMP) has been developed to provide a comprehensive framework for the protection, restoration, and sustainable management of the City of Melville's foreshore areas. The FMP consolidates and updates the previous Foreshore Restoration Strategy (GHD, 2019a) and the Estuarine Reserves Management Plan (NAMS, 2020) into a single, cohesive document to guide long term decision making and on-ground works. Its goal is to ensure that the City's foreshore remains resilient, accessible, and a meaningful place to be responsibly enjoyed today and protected for generations to come.

1.0 BACKGROUND TO THE FMP DEVELOPMENT

The Swan and Canning Rivers form 18 kilometres of the City's boundary, approximately 15 kilometres of which encompass narrow foreshore reserves vested in the City under the Perth Metropolitan Region Scheme (PMRS). The City and the DBCA have shared responsibility for management of the river foreshore, with the City's scope currently above the high water mark.

To address challenges associated with managing the foreshore, the City introduced a Foreshore Restoration Strategy in 1997 (ATA). This strategy was reviewed in five year intervals, namely in 2009 (NAMS), 2014 (GHD), and 2019 (GHD), to verify the condition of the foreshore and the associated assets (i.e. built assets) and prioritise foreshore and asset protection works to be implemented within the five year period. The prioritisation was based on the condition of assets, erosion and various recreational demands by the community.

Given that foreshore areas contain critical habitat for many flora and fauna species, the City developed an Estuarine Reserves Management Plan (NAMS, 2020) to manage vegetation and fauna of larger

reserves forming part of the foreshore comprising Attadale Foreshore Reserve, Blackwall Reach, Jeff Joseph Reserve, Point Walter Reserve and Troy Park Bushland.

Since the last review of the Foreshore Management Strategy in 2019 (GHD, 2019a), the City has updated a number of strategic management plans and conducted master planning for the Attadale - Alfred Cove (Element, 2022) and the Lower Goolugatup/Heathcote (UDLA, 2024) areas.

In 2024, the council adopted the *City of Melville's Council Plan for the Future 2024–2034* (the Council Plan), which provides a community-informed and Council-led vision for the City that sets out strategic direction for the next ten years. The Council's Plan outlines an updated vision for a Vibrant, Sustainable and Inclusive Melville and focuses on five key outcome areas outlined below, which are transferable to the FMP:

Healthy, Safe and Inclusive	Clean and Green	Sustainable and Connected Development	Vibrant and Prosperous	Good Governance and Leadership
Healthy, safe and inclusive communities with a sense of belonging and wellbeing.	A clean, green and sustainable City for current and future generations.	Sustainable, connected development and transport infrastructure across our City.	Economic prosperity and vibrant, resilient communities and businesses.	Leadership and good governance for the benefit of the whole community.

Leading from the Council Plan, the updated *Community Climate Action Plan* (2024 – 2030) (CCAP) was developed to guide the City's services and programs, emphasising emissions reduction and climate resilience between 2024 - 2030. The actions outlined in the CCAP are congruent with the Council's Plan as well as the *Corporate Climate Action Plan* (2023) and are pivotal in advancing the City of Melville's shared objective of achieving net zero emissions by 2050. By aligning foreshore initiatives with the CCAP, the City of Melville wants to ensure a cohesive approach to climate resilience, biodiversity conservation, and community engagement that are essential for foreshore management.

The updates to the *Urban Forest Strategy* (Arbour Carbon, 2024), which commit to increasing canopy cover, reducing the urban heat island effect, and connecting green corridors throughout the City, provide additional reasons for updating the FMP.

The amendments to the *Aboriginal Heritage Act 1972* in 2023 and the recent *Reconciliation Action Plan* (RAP) 2025-2028 (CoM, 2025c) have resulted in the City's increased commitments to reconciliation and care of natural areas, integrating cultural respect, collaborative governance, and environmental stewardship. These principles honour the cultural heritage of the Whadjuk people and promote sustainable practices for future generations.

In response to the Council vision for Clean and Green, the City has expanded its Natural Areas team to include a dedicated Foreshore Officer, a Natural Areas Project Officer, a Foreshore Maintenance Team Leader and a Crewperson, which provides further scope for foreshore management improvements.

Finally, the Department of Biodiversity Conservation and Attractions (DBCA) review of the River Protection Strategy (RPS) (DBCA, 2022b), provides the City with the responsibility for a catchment-wide approach to foreshore and waterway management. This document, alongside the Council's Plan, the Melville Water Dootanboro Locality Plan (DBCA, 2022a) and the Natural Areas Asset Management Plan (CoM, 2019), provides guiding principles for the maintenance and management of the City's foreshore and prioritises management actions for the term of the FMP.

Integration of key objectives and actions from the various relevant management plans into the FMP ensures that actions taken are not only environmentally sound but also socially inclusive and culturally respectful.

2.0 FORESHORE MANAGEMENT PLAN SCOPE AND OBJECTIVES

2.1 SCOPE

The following is the scope of work applied to this FMP:

Desktop Review

- Consolidate and review existing foreshore management documents and data, including:
  - Foreshore Restoration Strategy (GHD, 2019a);
  - Estuarine Reserves Management Plan (NAMS, 2020);
  - Natural Areas Asset Management Plan (CoM, 2019);
  - City of Melville Foreshore Condition Assessment 2024 (NAMS, 2025);
  - Aquatic Assets Survey Condition Assessment Report (MP Rogers & Associates, 2024);
  - Foreshore monitoring data (Excel and GIS data for flora, fauna and built assets condition reports) (CoM, 2025a);
  - Foreshore Strategy Review Engagement Report (CoM, 2024c);
  - Attadale Alfred Cove Foreshore Masterplan (AACFM) (Element, 2022);
  - Swan River Protection Strategy - Five Year Review (RPS), (SRT, 2022);
  - Melville Water Dootanboro Locality Plan March 2022 (DBCA, 2022a);
  - Council Plan for the Future 2024-2034 (CoM, 2024a);
  - Corporate Climate Action Plan (CoM, 2023a);
  - Community Climate Action Plan 2024 – 2030 (CoM, 2024b);
  - Water Quality Improvement Plan - Bull Creek 2022 (currently under review);

- Urban Forest Strategic Plan 2017-2036, Part A: City Controlled Land (CoM, 2017);
- Urban Forest Strategy Review -2024 (Arbor Carbon, 2024);
- Environmental Policy 2022 CP030;
- Public Spaces Strategy 2017;
- Local Heritage Survey and Local Heritage List 2019 Updated 2023 (CoM, 2023b); and
- Stretch Reconciliation Action Plan (RAP) 2025-2028.

Site Assessments

- Field-based assessments of key foreshore areas to validate and update condition and priority status for implementation works.

Stakeholder Engagement – Prioritisation Workshop

- Facilitate a project prioritisation workshop with key internal and external stakeholders to finalise prioritisation of the top five sites requiring stabilisation and revegetation works.

Concept Design and Costing:

- Develop high-level concept designs for up to five priority sites, including recommended foreshore treatments.
- Provide indicative cost estimates for each concept plan.

Plan Development

- Prepare a consolidated 2025 Foreshore Management Plan;
- Ensure the plan is congruent with the City's key management strategies, policies, and
- Identify project staging, funding needs, and long-term management strategies across the foreshore zone.

2.2 OBJECTIVES

This FMP marks a shift from previous strategy reviews toward a more integrated and practical framework for managing foreshore values across the City. The FMP balances immediate risk mitigation, long-term adaptive strategies, and ecological and heritage preservation with the community's recreational use of the area and regional long-term strategies for the rivers, as outlined by key stakeholders. The key objectives of the plan are:

- Protect and restore natural riparian buffers to support biodiversity, reduce erosion, and improve ecosystem resilience;

- Reduce reliance on hard infrastructure by prioritising soft or combined erosion control solutions wherever feasible;
- Safeguard critical foreshore infrastructure and recreational assets from climate change impacts, erosion, and other environmental pressures;
- Maintain river access and seek balanced approach maintaining recreational values whilst adapting to climate change and managing development pressures;
- Establish a prioritised and costed list of actionable projects for staged implementation over the next five years.

2.3 AREA COVERED BY THIS FMP

The foreshore zone for the purposes of this plan is defined as the area from the high water mark to the nearest pathway or road, or the cadastral boundary in the case of Attadale Reserve to Alfred Cove, Tompkins Park and the Jeff Joseph Reserve and the Strand.

Previous strategies excluded foreshore zones that are managed by DBCA, however, these have now been incorporated in the FMP through new land management agreements arising from the Attadale Alfred Cove Masterplan and the Goolugatup Lowerlands Plan.

Given that the foreshore zone is very narrow and difficult to present visually at a large scale, a 50 m buffer boundary was allocated from the City of Melville cadastral boundary for mapping purposes (Figure 1). This boundary was used for the assessment of vegetation flora and fauna by NAMS (2024), and all of the statistics regarding flora, fauna and tree health refer to this zone. This boundary may be revised in the future as the City undertakes updates to asset classification and numbering systems.

2.4 TERM OF THE FMP

This FMP is outlining management objectives and actions to protect, restore, and manage the City's foreshore zone for the term of five years from 2025 – 2030.

Figure 1. Foreshore Management Plan area.

2.5 DOCUMENT STRUCTURE

The FMP is divided into the following sections:

Part A – City of Melville Foreshore Context This section provides an overview of the physical and biological environment of the City's foreshore, including its historical and current use, and cultural and social significance. It establishes the context for identifying key values and understanding existing and potential threats.

The contextual descriptions focus specifically on the foreshore and river dynamics, while broader regional information on various environmental factors is covered in the City's Natural Areas Asset Management Plan (NAAMP) (CoM, 2019).

Part B – Foreshore Assessment 2025 presents the methods and findings from the 2025 assessment. It includes a summary of community survey feedback highlighting key values and concerns raised by the public.

The prioritisation of asset protection and the identification of five high-priority risk-reduction projects to be undertaken over the next five years is also included in this section. In addition, the section outlines the work completed in the period from 2019 to 2025 and provides links to relevant appendices, including the status and outcomes of actions recommended in the 2019 Foreshore management strategy (GHD, 2019a).

Part C – Foreshore Management – This section outlines both general and sub-precinct-specific management actions required to address the asset condition and threats identified in Part B. It covers some of the key maintenance items for each sub-precinct and outlines an overarching management action table that encompasses the entirety of the foreshore. The overarching management table is underpinned by the Council outcomes and incorporates foreshore specific actions identified through on-ground observations and aligned with the overarching objectives of various relevant City management plans.

PART A: CITY OF MELVILLE FORESHORE CONTEXT

City of Melville foreshore is a highly valued and used space by the community, consisting of multiple sporting facilities, boat ramps, cafes, walking and cycling pathways and several areas for passive recreation. In addition to community values, the foreshore forms part of an important regional green link bordering the Swan-Canning Riverpark that provides habitat for flora and fauna, some of which are threatened and/or migratory. The foreshore is also culturally significant for the Whadjuk, having spiritual and mythological significance associated with the Dreamtime, important songlines and various cultural practices.

3.0 HISTORICAL AND CURRENT LAND USE

3.1 SITE USE PRIOR TO SETTLEMENT

Long before European settlement, the foreshore area and the City of Melville were and still remain part of the rich and ancient cultural landscape of the Whadjuk people, the Traditional Custodians of the area. The profound spiritual, cultural, and practical importance of this landscape relates to the past uses of the area for hunting and gathering, seasonal camping, and ceremonial and spiritual practices over millennia.

Prior to settlement, the majority of the narrow foreshore was a densely vegetated floodplain wetland with outcrops of limestone at Blackwall Reach, Point Dundas, and Heathcote and bordered by large sand dunes to the west and east. Groundwater seeps that are currently indicated by the presence of species such as *Typha orientalis* and *Schoenoplectus tabernaemontani*, as well as freshwater paperbarks near the shore, are signposts of the past wetlands that contained freshwater. Remnant Marri trees slightly higher on the profile are also indicators of freshwater presence at the boundary of the historic wetlands.

Records of stories and place uses along the shoreline indicate that the foreshore area would have been a source of abundant food throughout the year. These foods would have included (outside of rich fishing and prawning grounds on the flats and the river) turtles, gilgies, and waterfowl, as well as terrestrial animals, such as possums, bandicoots and kangaroos, that likely frequented the margins of the wetland. A variety of plants that could be used for food, medicine or ceremonial purposes would have also been present in the area and likely utilised by family groups moving between camps in the wider Melville area (e.g. between Alfred Cove and the North Lake / Bibra Lakes along an ancient paleovalley).

Despite the irreversible changes that occurred after settlement, the foreshore area remains a living cultural landscape — a place where ancient traditions meet contemporary stewardship, and where ongoing management efforts aim to honour the deep and continuing connection between the Whadjuk people and the Derbal Yerrigan and Djarlgarro Beeliar.

3.2 SITE USE AFTER SETTLEMENT

With the arrival of European settlers in the 1820s and 1830s, the Melville foreshore landscape began to change dramatically. Bicton was one of the first locations to be settled, with agricultural activities beginning in the 1830s (CoM, 2025b). While foreshore land in Attadale and Alfred Cove was granted during the early 1830s, the substantial development in these areas was slower, possibly as a result of difficulties in draining existing wetlands. Attadale began to be subdivided in the 1890s and experienced more rapid residential growth after World War I (Gregory, 2003). Between 1895 and 1897, the mouth of the Swan River was widened, creating an estuary and changing the river dynamics to a tidally influenced environment. This change would have started the decline of the riparian edge vegetation; however, the physical changes occurring upland due to clearing, draining of the foreshore, and later high levels of urbanisation and infill were key drivers to the current shoreline condition.

Alfred Cove, particularly the eastern section, remained predominantly rural throughout the nineteenth century, only undergoing significant suburban development during the 1950s and 1960s. In the case of Applecross, the suburb was initially subdivided in the 1890s, with the Heathcote area gaining particular prominence following the establishment of the Heathcote mental health facility in 1929.

Mount Pleasant was first subdivided in 1911, and residential growth accelerated gradually through the 1920s and 1930s, with significant expansion occurring after World War II (Gregory, 2003). The development of Brentwood peaked in the 1950s, as a result of government initiatives to accommodate returned servicemen and their families.

While the changes to the foreshore landscape started in the early 1900s, they peaked during the 1950s and 1960s, specifically as a result of infilling the foreshore areas and dredging of the river flats. The changes were most prominent in the Attadale and Alfred Cove areas, with both domestic landfill and dredge material being used to create the current landform. Additional changes to the shoreline occurred as a result of dredge infill of areas such as Point Walter, Jeff Joseph Reserve, South Perth Yacht Club, Apex Park and Deep Water Point, creating the current shoreline shape. Introduction of invasive species and modification of river flows through infrastructure such as jetties, groynes, and stormwater drains further contributed to the shape of the shoreline alongside changes to climate and river dynamics.

As the foreshore developed into public use parklands in the late 1960s to 1970s, the communities started utilising the foreshore for recreation, picnicking, and boating — uses that gradually intensified as Perth expanded and are ongoing today. Currently, very small areas of the foreshore include remnant vegetation, and these areas have been recognised for their significance via protection as Bush Forever Sites and important regional biodiversity linkages, particularly those of Alfred Cove, Attadale and Blackwall Reach Areas.

4.0 VESTING AND LEGISLATIVE CONTEXT

4.1 VESTING

City of Melville foreshore incorporates land that is:

- State owned land managed by the State (DBCA);
- State owned land managed by the City of Melville; and
- Freehold land owned and managed by the City of Melville.

The different ownership for foreshore zone areas is outlined in Figure 2.

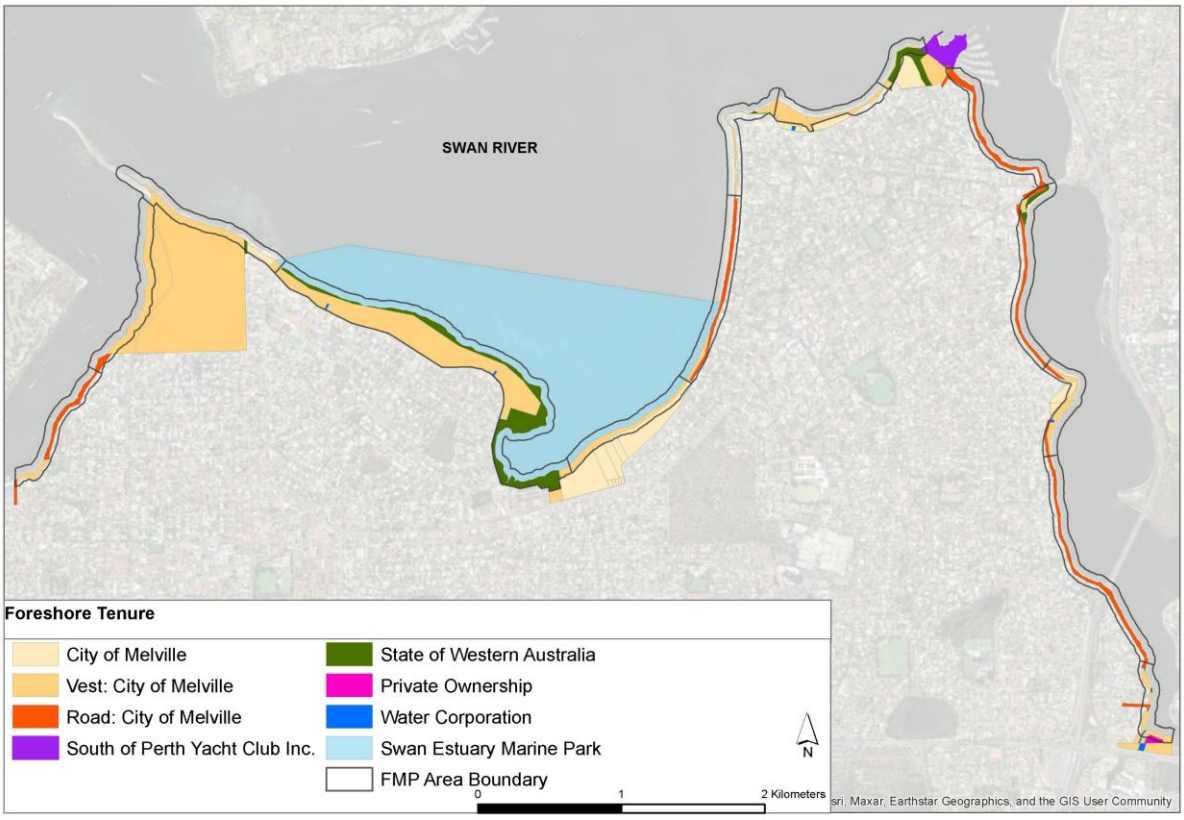


Figure 2. Foreshore tenures and areas for management vested with City of Melville and other stakeholders.

The foreshore is listed under the Metropolitan Region Scheme and the City of Melville Local Planning Scheme 6 (LPS 6) as "*Parks and Recreation*", therefore outlining its importance and permanence in the City's landscape.

4.2 LEGISLATIVE CONTEXT

This plan has been prepared taking into consideration legislative requirements, guidelines and strategies at a local, state, national and international level for the management of land and waters. Given that the City's NAAMP provides an outline of all the legislation pertaining to the management of

natural areas, the legislation relevant to the management of the foreshore has been briefly outlined in a tabular format in Appendix 1. It is recommended that future revisions of this document take into consideration changes to legislation that may be in force from September 2025.

From a legislative perspective, it is important to note that the entire foreshore falls within the Swan Canning Development Control Area (DCA). DBCA provides advice and makes recommendations on development and land use applications that affect the DCA in accordance with the relevant policies and guidelines for the DCA. Any significant restoration activities proposed for the foreshore area, including revegetation or weed control, must be outlined and discussed with DBCA to seek their approval. Outside of this, the City can perform routine maintenance in the area without the need to obtain a permit. This includes the removal of dangerous, dead, or dying trees that pose a safety risk to the public and the environment, as well as the pruning of vegetation along pathways and general weed control.

5.0 ENVIRONMENTAL CONTEXT

5.1 CLIMATE

The foreshore experiences a typical warm Mediterranean climate characterised by hot, dry summers and mild, wet winters. The closest meteorological station with reliable long-term data relevant to the site is Perth Metro (Station 009225). The mean winter (July) temperature is 19.5°C, whilst the summer (February) temperature is 31.7°C. The average annual rainfall is 726.9 mm, with 55% falling in the winter months (June to August). Historical climate data for the Perth Metro weather station (009225) for the years 1994 to 2024 are summarised in Figure 3.

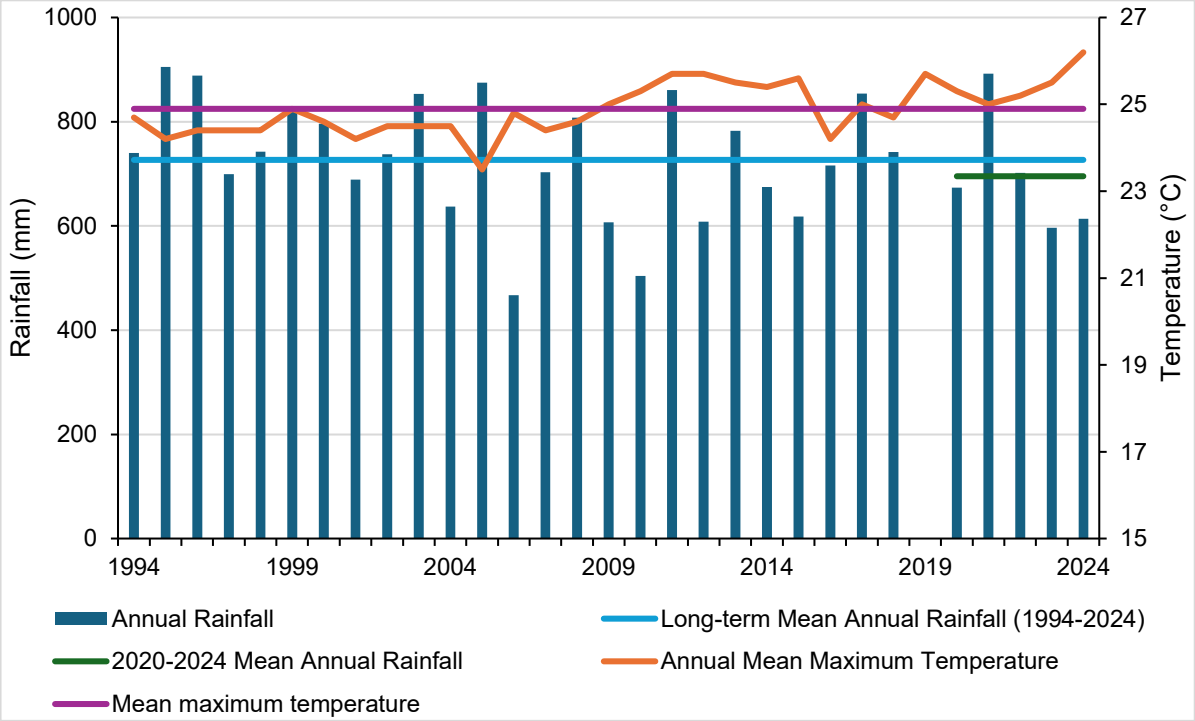


Figure 3. Mean rainfall and mean temperature maxima for Perth Metro (009225) weather station for years 1994 to 2024 (BoM, 2025).

The mean average rainfall of the last five years is slightly lower than the historical average by 31.5 millimetres. However, rainfall in 2023 and 2024 was substantially lower than the historical average by 130.5 millimetres and 113.3 millimetres, respectively. 2021 was the only year to record above-average rainfall by 196.6 millimetres. These trends are consistent with projections in the latest State of the Climate report (CSIRO, 2024), which forecasts continued drying conditions across southwest Western Australia, particularly in winter and spring, along with an increased frequency and duration of drought events. Sea level rise and more frequent storm surges are also anticipated, both of which will continue to impact the foreshore.

The mean annual maximum temperature is 24.9°C. In the last five years, the maximum temperatures were been above the historical average of 0.1 - 1.3°C. In 2023 and 2024, the annual mean temperature was 0.6°C and 1.3°C above the historical average, respectively.

The drying climate/low rainfall combined with high temperatures has implications for vegetation growth, particularly for newly revegetated areas and vegetation sensitive to changes in freshwater input/groundwater decline and increase in salinity (e.g. freshwater paperbark). The durability of bioengineered shoreline protection structures is also impacted by changes in water levels and temperatures. As such, erosion control and revegetation strategies must be designed to be both adaptable and resilient. For revegetation, this includes selecting a diverse range of locally endemic species native to the foreshore or the City of Melville LGA, and that are tolerant of drier conditions and capable of successful reproduction under such stress.

Planting times for both upper and lower banks need to take rainfall patterns and seasonality into consideration, and adjustments should be made to manage these changes with contingencies in place to facilitate the initial establishment of seedlings (e.g., irrigation after installation and during the first summer).

5.2 LANDFORM AND TOPOGRAPHY

The shoreline edge varies between steep to precipitous limestone cliffs at Blackwall Reach, Goolugatup and Point Dundas, with elevations up to 9 m AHD, to relatively flat landscape for the remainder of the foreshore, ranging from 0 to 2.5 or 3 m AHD (Figure 4).

Flat landform and low elevation for the majority of the foreshore make a large portion of the site susceptible to flooding. This can pose issues for plant establishment, foreshore recreational use, as well as erosion and for Attadale / Alfred Cove areas landfill exposure.

5.2.1 Bathymetry

River bathymetry adjacent to the foreshore reveals variable depths, with shallow water (0 to -1.5 m) along large areas of the northern foreshore, grading to depths of over 15 m near Blackwall Reach and at the river talweg. The Canning River bathymetry ranges from 0 to -6 m at the thalweg, which is relatively close to the shoreline.

The bathymetry of the near foreshore was modified during the early 1960s to expand foreshore areas (e.g. Point Walter and Jeff Joseph Park) and utilise dredge sand for capping of landfill at Attadale foreshore and Thompson Park, or to make way for watercraft.

The natural and artificial bathymetric changes to the river bed strongly influence sediment transport and shoreline erosion alongside river flows, tides, and the wind or watercraft-induced waves.

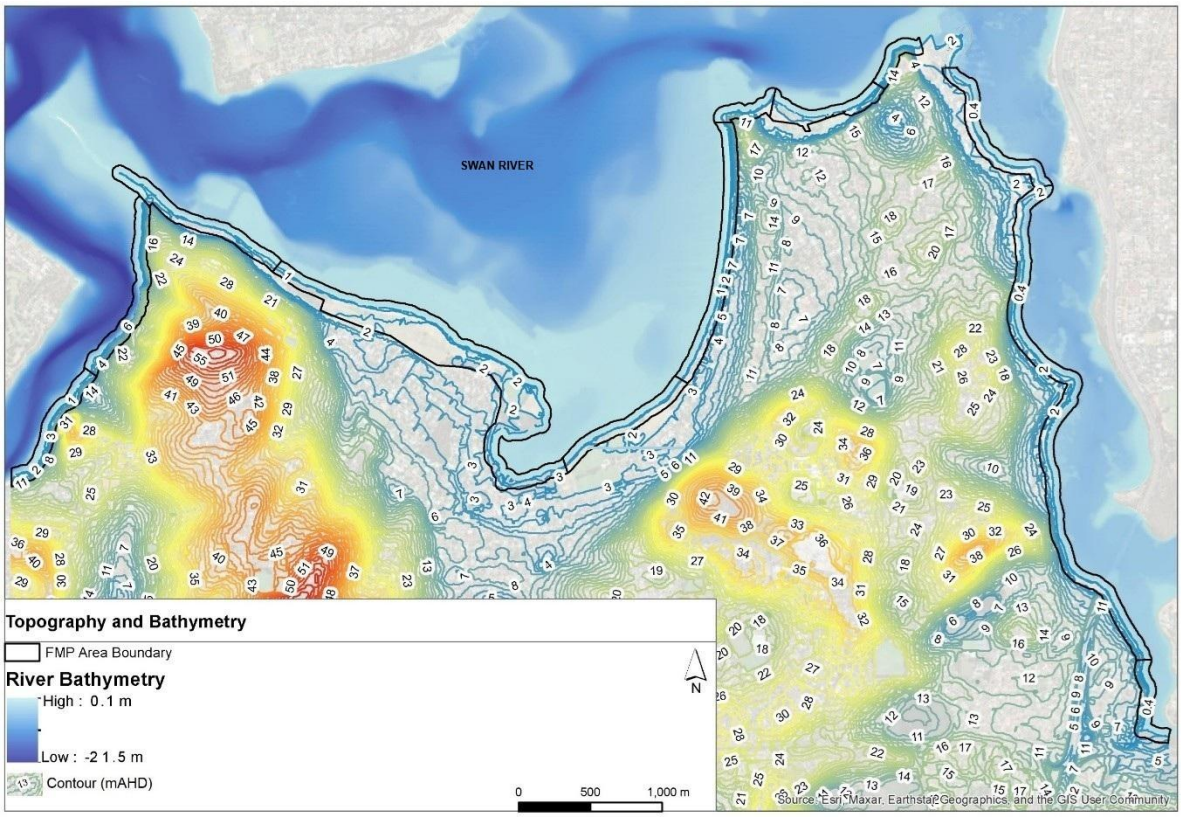


Figure 4. Foreshore and the surrounding area topography.

5.3 GEOLOGY AND SOILS

GSWA (1986) describe the geology of the foreshore area as that of three units: Alluvial sands (S14), Alluvial Silty Sands (Sm1), and Tamala limestone (LS1). Sands derived from Tamala limestone cover the upland areas away from the foreshore (Figure 5).

Due to dredging activities in the 1960s and prior use of areas for landfill, large portions of Attadale Reserve and Thompson Park have unconsolidated soils of variable quality. These soils, in addition to natural soils, are highly susceptible to erosion particularly where slopes are steep and/or devoid of vegetation (which normally stabilises surface soil layers) where the site is in a high-energy environment (like tidal channels or flood zones) or there is a change in hydrology (e.g. groundwater levels dropping reducing soil moisture which can give some cohesiveness to soils).

While generally considered moderately stable, limestone outcrops present along the foreshore are still prone to erosion and collapse over time, particularly where tides, waves or river flows can undermine softer sections of limestone.

The susceptibility of soils to erosion alongside other parameters such as the topography, river flows, flooding, vegetation coverage and anthropologic impacts influences the type and extent of specific erosion control and revegetation methods that are recommended as part of foreshore restoration.

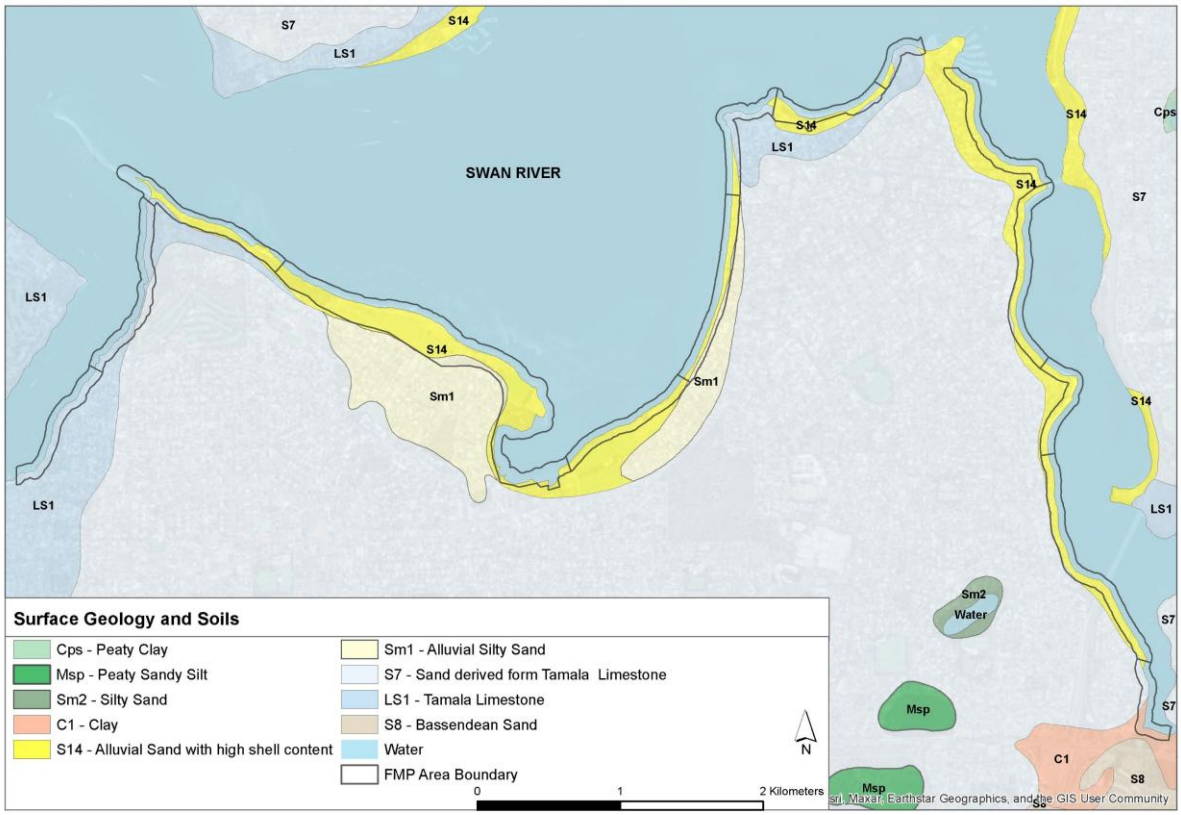


Figure 5. Foreshore area surface geology and soils.

5.3.1 Acid Sulfate Soils (ASS)

A review of available information indicates that the majority of the foreshore area is located within 'moderate to low' risk of encountering acid sulphate soils within 3m of the natural soil surface (Figure 6). However, this risk is not equal between sites due to the underlying geology, soils and heterogeneous infill in some areas of the foreshore.

Previous soil and groundwater investigations at Attadale Reserve and Alfred Cove / Tompkins Park (GHD, 2015, 2016) did not study ASS specifically, but have outlined the presence of swamp deposits (peaty) fill. Given that the project area was originally part of an extensive salt marsh and freshwater wetland, it contains deposits rich in organic materials (e.g. peats and fine sediments), iron, and sulphur. In the presence of these compounds, sulfur reducing bacteria can produce hydrogen sulfide, which can then react with iron to form iron sulfide (iron pyrites). Soils containing iron sulfides are known as potential acid sulfate soils (PASS) and are generally stable when wet (i.e. below the water table due to the relative lack of oxygen). However, when exposed to air, through drainage or excavation, the iron sulfides in the soils react with oxygen and water to produce iron compounds and sulfuric acid thereby creating an actual acid sulfate soil (AASS).

The soil's Acid Neutralising Capacity (ANC) is likely high in the western and northern sections of the foreshore due to the presence of limestone and carbonate shell material from the original dredging of the river, which was used to cap the landfill. While revegetation activities are unlikely to cause issues with ASS due to only surface 10 – 20 cm being disturbed, specific investigations will be needed wherever there is a need to excavate or regrade the banks.

Any excavation of material from the site (e.g. when grading the foreshore or installing erosion control structures) must take into consideration the risk of ASS, and appropriate management measures should be in place to manage this risk (e.g. liming of excavated material). Detailed ASS investigations in accordance with relevant DWER and City of Melville guidelines will be required, and an ASS Management Plan will be prepared for submission to the Department of Water and Environment Regulation (DWER) for approval prior to commencement of site works requiring extensive excavations.

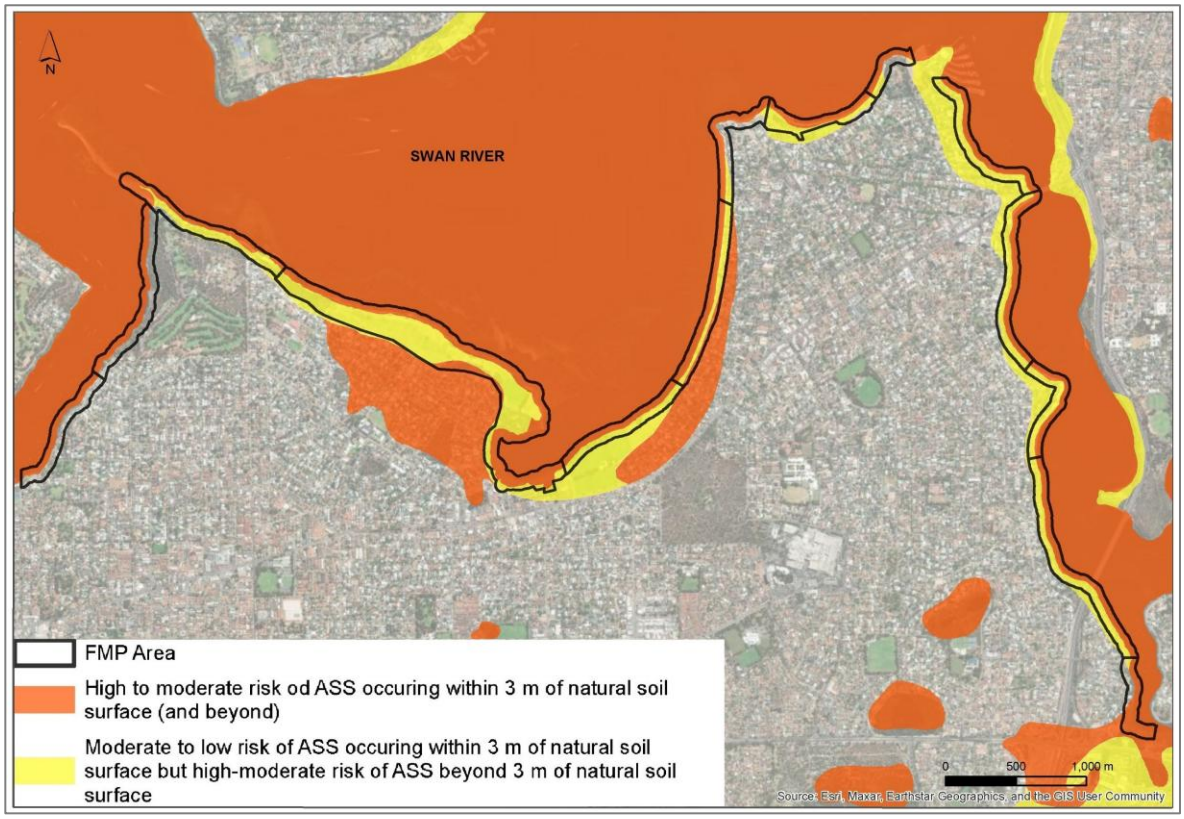


Figure 6. Acid sulfate risk map for the foreshore.

5.3.2 Contamination

The past landfill activities in the foreshore area have resulted in Attadale Reserve, Troy Park, and Thompson Reserve being classified as contaminated. Apex Reserve, located adjacent to Canning Bridge, is also listed in the contaminated sites database (DWER, 2025). All areas are currently placed in the “Remediated for Restricted use” category based on the site investigations conducted in 2015, 2016 and 2017, respectively (DWER, 2025) (Figure 7).

The current classification of the contaminated areas is “*Remediated for Restricted Use*” based on the presence of inert waste material, including potential asbestos-containing material at depths greater than 1 m below ground level for Attadale Reserve and Thompson Reserve. (DWER, 2017a, 2017b) and hydrocarbons in groundwater and soils at the Apex reserve (DWER, 2017c). As such, the sites are restricted for recreational use only, unless further specific investigations are conducted to shift the classification to a more sensitive land use.

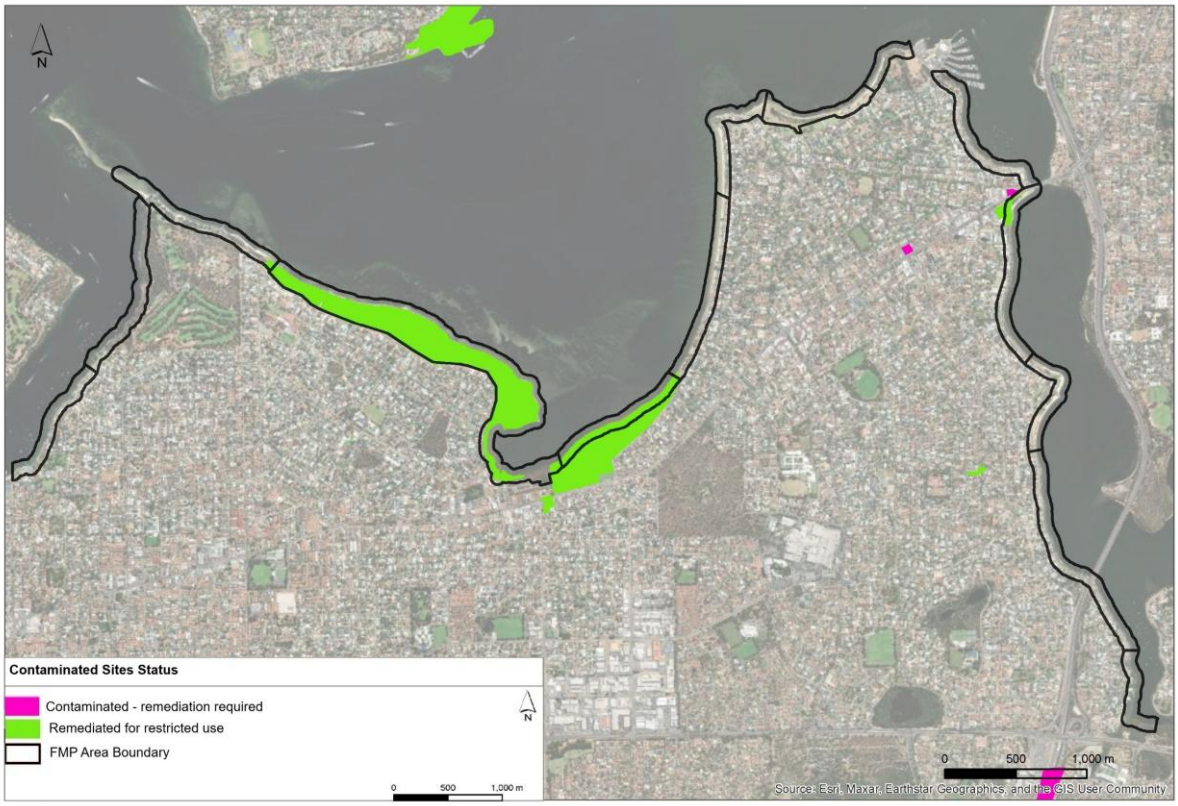


Figure 7. Location and extent of contaminated sites associated with the foreshore.

Detailed site investigations by GHD in 2015 and 2016 have determined the extent of fill material for both the Attadale foreshore and the Tompkins Park area. For these areas, the fill material is 0.5 - 2 m thick in places and overlain by a sandy cap layer 0.1 - 0.5 m thick. The fill material mostly contained building rubble, including potential asbestos-containing material at depths greater than 1 m below ground level. (DWER, 2017a,2017b), metal and plastics.

The Troy Park area (part of Attadale reserve) was one of the earliest sites for landfill disposal and infill for a period of 18 years between 1937 and 1955, with a capping layer added in the 1960s to create the current oval. Attadale Reserve (Dog Park) operated as a tip between 1961 and 1964, whereas Tompkins Park tip operated between 1955 and 1964.

Landfill material and other contaminants may negatively impact the growth of vegetation in some localised areas of the site, where highly compacted rubble may be present, or in areas with potential contaminants such as heavy metals. In the case of Apex reserve, this includes potential hydrocarbons in groundwater (DWER, 2017c).

Assuming disturbance to the fill beneath the project area is limited to small-scale excavations under controlled conditions and by experienced contractors (e.g. when regrading of the riverbank slope), the landfill presents no unacceptable risk to human health or river ecology. However, landfill classification will need to be determined prior to works and any disposal at an appropriate facility (e.g. Red Hill). Classification involves testing of soils by a qualified contractor to determine the total concentration of contaminants (measured in mg/kg) and, if necessary, leachability. Results from an accredited NATA laboratory are used to inform the classification and appropriate management of waste upon its submission to a licensed facility. The testing and disposal of soils must be taken into account when

budgeting for foreshore restoration works, with sufficient contingencies in place to ensure completion of projects.

5.4 HYDROLOGY AND RIVER INTERACTIONS

5.4.1 Surface Water

The project area is located along the banks of the Swan and Canning Rivers, which have permanent surface water throughout the year. The river flow direction is from east to west, from Brentwood towards Bicton. There are no other surface water bodies in the foreshore area, with the exception of a drainage outlet sump at the Haig Road, Troy Park. The water within the sump is likely to be groundwater as it persists during summer months and is mixed with stormwater during winter rainfall events.

There are a number of stormwater drains (see Figure 8) crossing the foreshore reserves and discharging into the rivers. These drains generally discharge from the adjacent roads but also convey stormwater from a wider catchment. The flows from the main drains discharging along the foreshore are not known, although anecdotally, the Cantray Ave drain at Tompkins Park east has water flowing throughout the year.

Almost all of the key drainage lines have Gross Pollutant Traps (GPTs) installed, and the City is proactively updating drainage outlets as part of the drainage network upgrade and maintenance. The GPTs are regularly maintained, therefore reducing the risk of various pollutants and contaminants entering the foreshore and the river system.

Most of the new drains have been designed to prevent inundation during normal water levels; however, many are inundated when water levels are high, which can cause flooding upstream of the outlet. Some drains (e.g. Bicton foreshore) have Duckbill valves with a flexible rubber sleeve to avoid entry of water from the river into the stormwater pipe; however, this is rare and generally applied to pipes with no headwalls. Many outlets have a headwall and a drainage apron (e.g. Melville Road beach site); however, there are still several stormwater outlets that have poor scour protection and or are blocked by sediment or vegetation growth.

Due to poor permeability of some compacted sections of the foreshore, and the variable surface levels (i.e. presence of depressions), some surface water may pool or flow as sheetwash over the bank during storm events, causing erosion, and or further compaction. This is evident in the landfill areas and where rock rip rap and revetment have gaps (note: overwash from the storm waves also contributes to erosion behind revetment).

Wetlands

The foreshore provides a border or is part of a conservation significant Swan and Canning Rivers Estuary Waterbody wetland, with Alfred Cove and Bull Creek being other conservation significant Estuary Peripheral Wetlands (Figure 8). These wetlands are rich in biodiversity and home to *Subtropical and Temperate Coastal Saltmarsh* ecological community classified as Vulnerable at the federal level under the EPBC Act and Priority 3 on a state level, and support a diverse array of aquatic and terrestrial species. Swan Estuary Marine Park flats and seagrass beds bordering the northern

foreshore from Point Walter to Tompkins Park provide essential feeding grounds for migratory shorebirds. The health of these sensitive ecosystems is closely monitored to address challenges such as nutrient loading, algal blooms, and invasive species.

All foreshore activities and ecological improvements must consider the impacts on the Marine Parks and wetlands, and select suitable species for revegetation that match the hydrological conditions associated with these habitats.

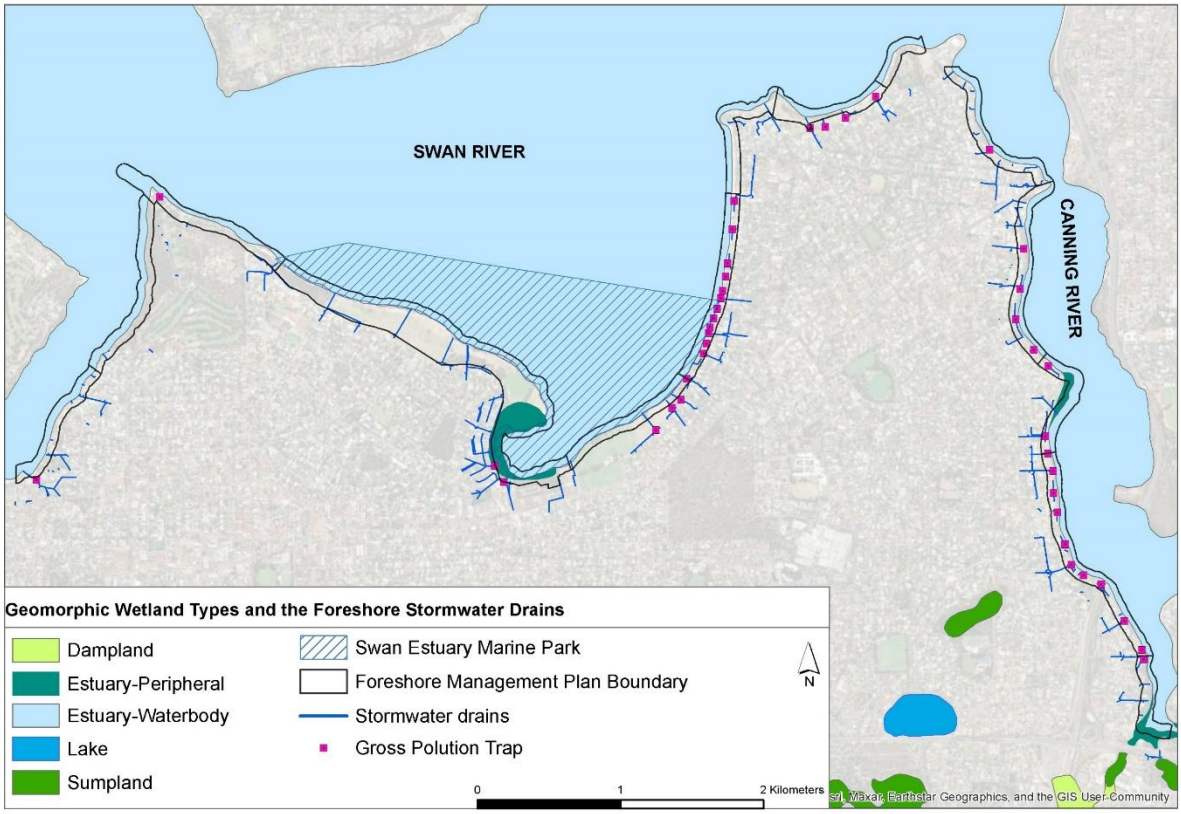


Figure 8. Geomorphic wetlands and the stormwater drainage network associated with the foreshore.

5.4.2 Groundwater

Mapping of historical maximum groundwater levels in the Perth Groundwater Atlas (DWER, 2019) identifies that the depth to groundwater within the foreshore area varies between 0 m below ground level (bgl) along the river banks where groundwater seeps occur, increasing to above 5.0 m bgl, dependent on topography and geology. In most parts of the flat sections of the foreshore, groundwater levels vary between 0.5 - 2.5 m bgl.

The groundwater is generally brackish to saline in the near foreshore areas due to interactions with the river water (DWER, 2019).

The DWER groundwater monitoring database does not provide metered information for groundwater bores within the foreshore areas, and most nearby bores have outdated data that is not directly applicable. Therefore, the actual levels and the water quality data for various areas of the foreshore

are unknown, but highly likely to remain high throughout the year, given the proximity to the river and the low elevation.

Due to high groundwater levels along most of the foreshore, the opportunity to infiltrate and treat stormwater is limited, which is compounded by narrow foreshore width, existing infrastructure, and the need for conveyance, as well as the presence of contaminated infill and catchment groundwater inputs.

Groundwater in some areas of the foreshore may be contaminated (e.g., hydrocarbons at Apex Reserve (DWER, 2017c), which may impact vegetation growth. In a similar manner, pockets of infilled foreshore at Attadale/Alfred Cove may also experience higher levels of contaminants, which can negatively affect vegetation growth.

Nutrient levels in groundwater resulting from garden runoff in the catchment are elevated, particularly in the Bull Creek Catchment. While some measures have been taken to improve water quality within the Bateman Reserve, these actions have limited efficacy due to the limited size of the vegetative biofilter, hence requiring catchment-based solutions.

5.4.3 Water Levels

River water levels are microtidal and predominantly diurnal, with tidal residuals of similar magnitude to the tides, producing a complex water level signal within a range of approximately 2 metres. This includes seasonal and interannual variability in response to tidal and climatic cycles, resulting in relatively narrow zones subject to regular tidal exposure (-0.25 to +0.75 m AHD) or less frequent inundation during storm events to +1.25 mAHD (Figure 9).

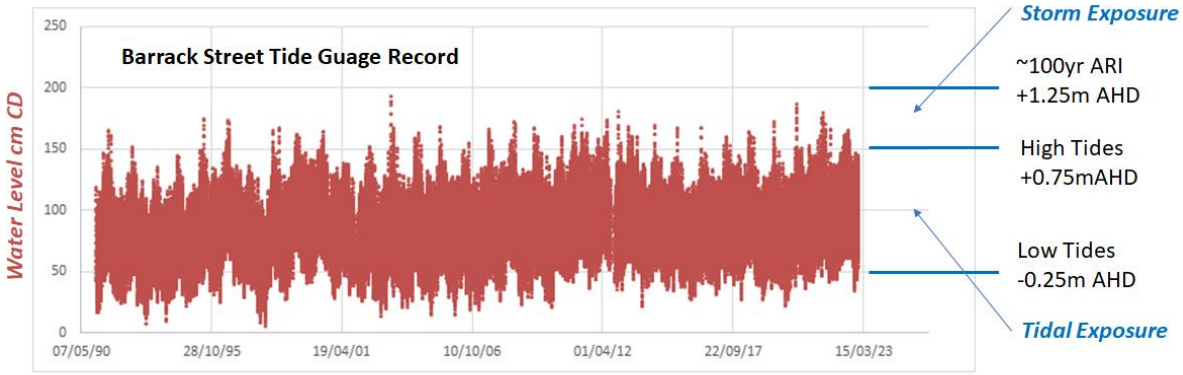


Figure 9. Simplified vertical zonation based on water levels

Flooding

Considering allowances for wave influence (+/-0.75m) and projected sea level rise (up to +1.0m), the foreshore zone can be approximated by the elevation range from -1.0m to +3.0m AHD (Figure 10). This shows variable width around the City of Melville foreshore, with wider subtidal and supratidal areas along Attadale and southern Applecross foreshores. As a generalisation, there is limited built infrastructure within this zone, particularly below +2.0m AHD, which roughly describes present-day

exposure to foreshore processes. It is noted that the wide foreshore reserves along Attadale and Applecross include areas of landfill, resulting in an elevated profile less prone to flooding.

The areas shaded yellow, green, and blue in (Figure 10) represent low-lying land that is subject to more extensive inundation during current high tides and storm events. These inundation risks are expected to increase in the future as a result of climate change and sea level rise. Accordingly, expanding vegetation buffers in these areas is an important measure for mitigating the impacts of climate change and rising sea levels, particularly in locations such as Attadale Bushland and Jeff Joseph Reserve.

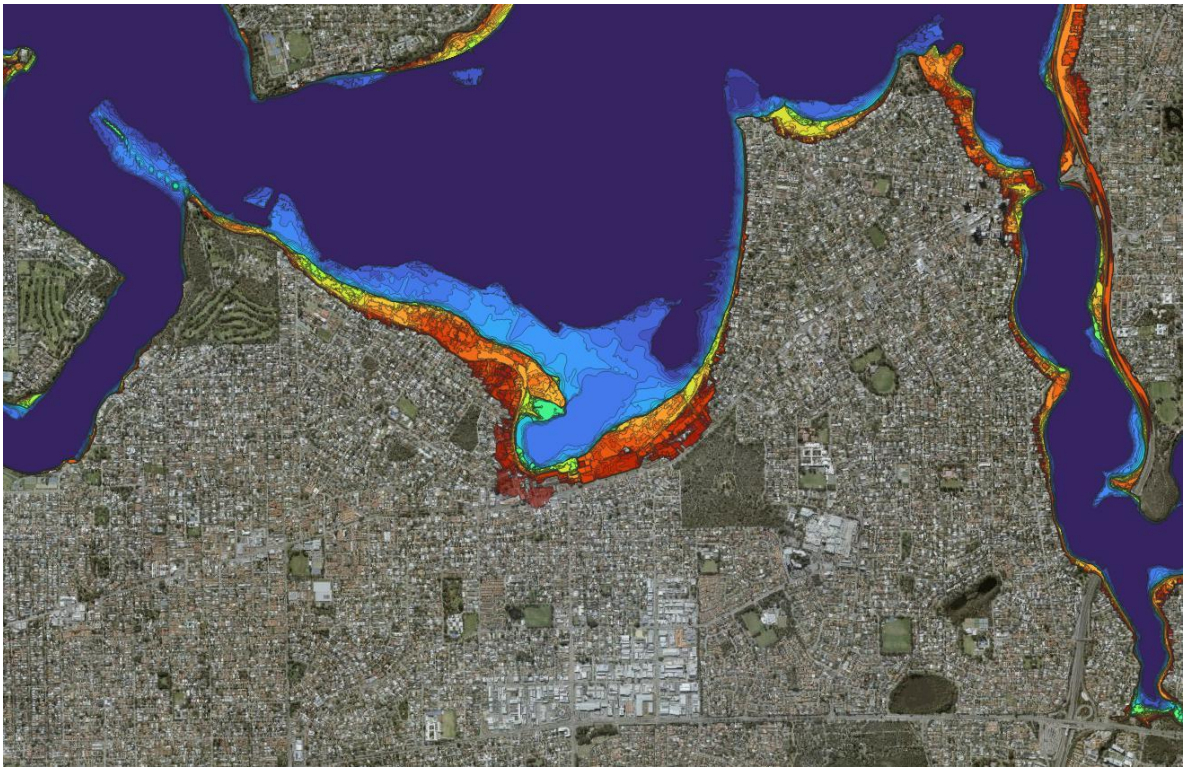


Figure 10. Nearshore levels from -1.0 to +3.0m AHD.

The 1% AEP (or 1 in 100-year ARI) flood mapping by DWER, with the allowance for sea level rise shown in Figure 11, indicates that almost the entire foreshore is subject to inundation under such conditions.

While 1 % AEP events are currently rare, the occurrence of 10% events (1 in 10-year ARI) is likely and has the potential to erode upper sections of the embankment in line with the current eroded scarp evident for many sections of the foreshore.

The erosion protection and mitigation of changes in water levels resulting from sea level rise necessitate the reinstatement of wider vegetation buffers, assisted by bioengineering (where required), and/or the installation of defences such as walling and rock revetments in narrow foreshore areas with significant infrastructure. In the medium to longer term, proactive planning for managed retreat and adaptive design will be essential to balance the protection of critical assets with the restoration of natural foreshore processes and ecological resilience.

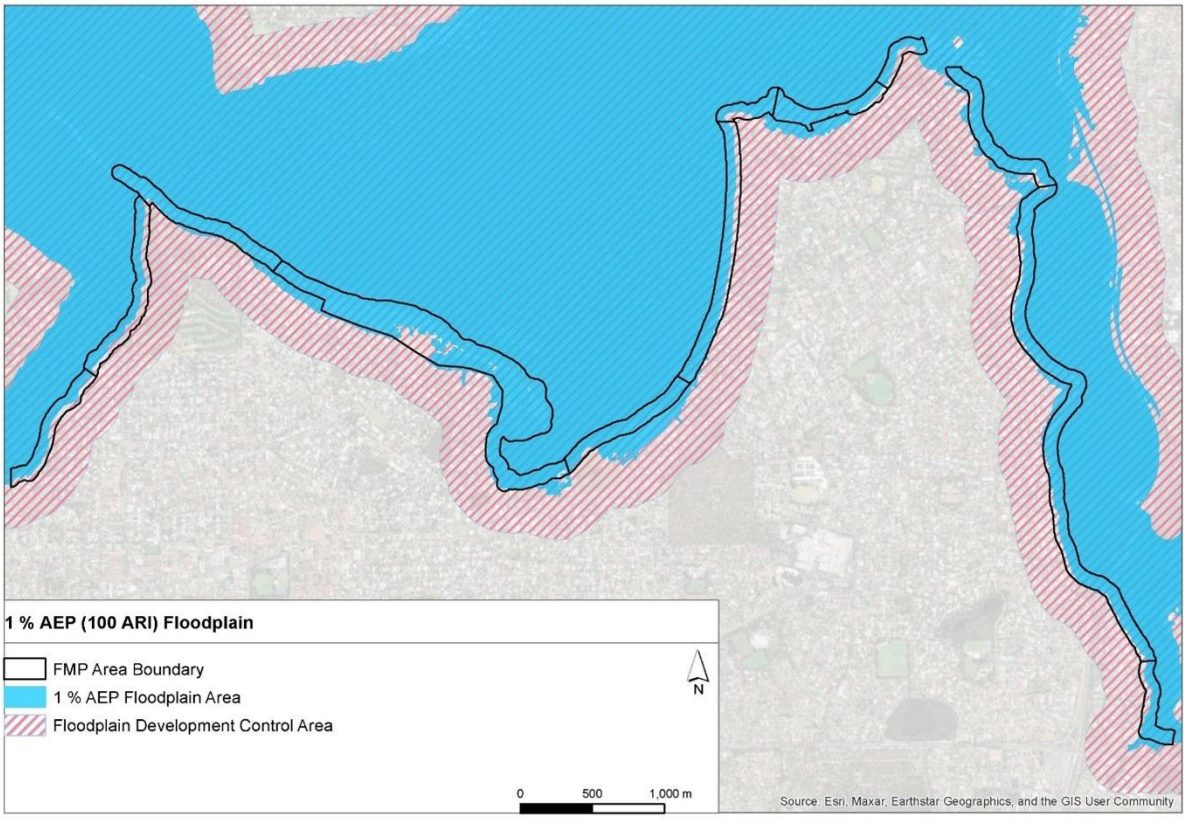


Figure 11. Extent of Flood for a 1% AEP (100 ARI) incorporating sea level rise and the Floodplain Development Control Area (DBCA).

5.4.4 Waves

Exposure to foreshore processes is partly determined by wave conditions, which can:

- Affect stability of foreshore edge treatments, including both walling and riparian vegetation.
- Create seasonal change and episodic change to foreshore profiles, combining with water level variability.
- Contribute to alongshore sediment transfers.

Wave conditions are determined by a combination of winds and available distances over which the wind can blow to generate waves (fetch length), modulated by frictional damping across shallow depths. Consequently, while Perth winds are dominated by sea breezes, easterlies, land breezes and westerly storms (Figure 12), patterns of wave generation within the Swan-Canning lower estuary are complex, with the highest capacity for large wind waves occurring through the central Melville Water basin (Figure 13).

High wave energy conditions are experienced along limited parts of Melville foreshore, including the northern part of Lucky Bay and in Waylen Bay. Wave sheltering elsewhere occurs due to foreshore orientation, limited fetch, or protection from a wide subtidal terrace. Protection from the terrace is depth dependent, and therefore, while Attadale foreshore is typically sheltered, it can experience substantial short-term pressure during west-northwest storms if they simultaneously cause high water levels.

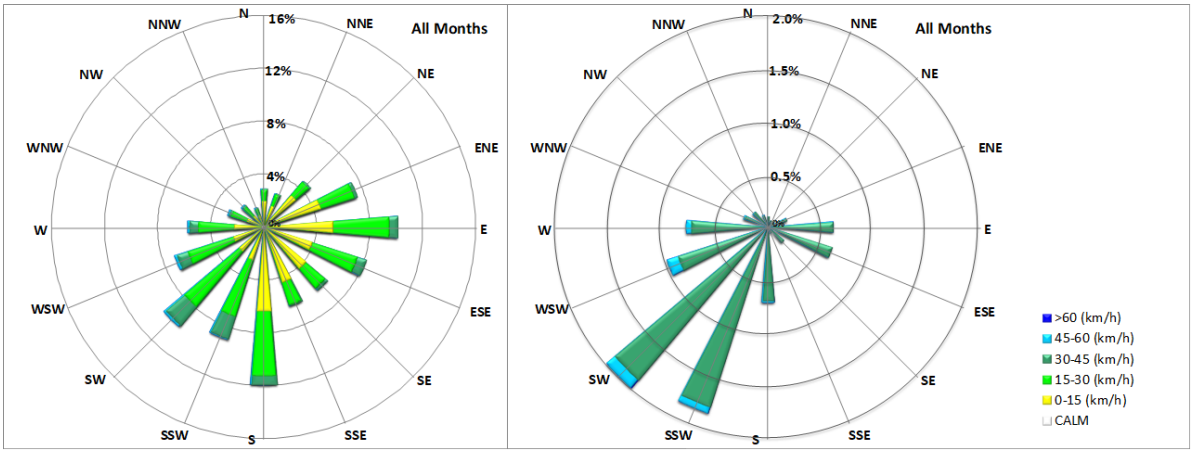


Figure 12. Melville water wind roses (left) all winds, (right) winds >30 km/h

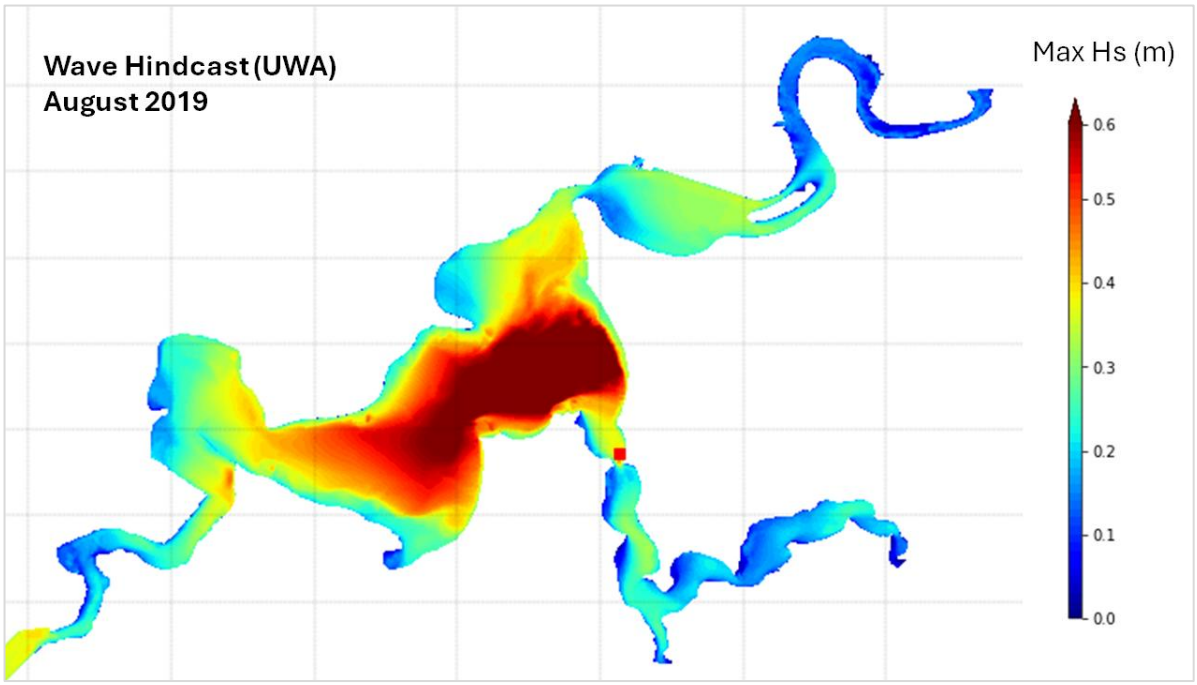
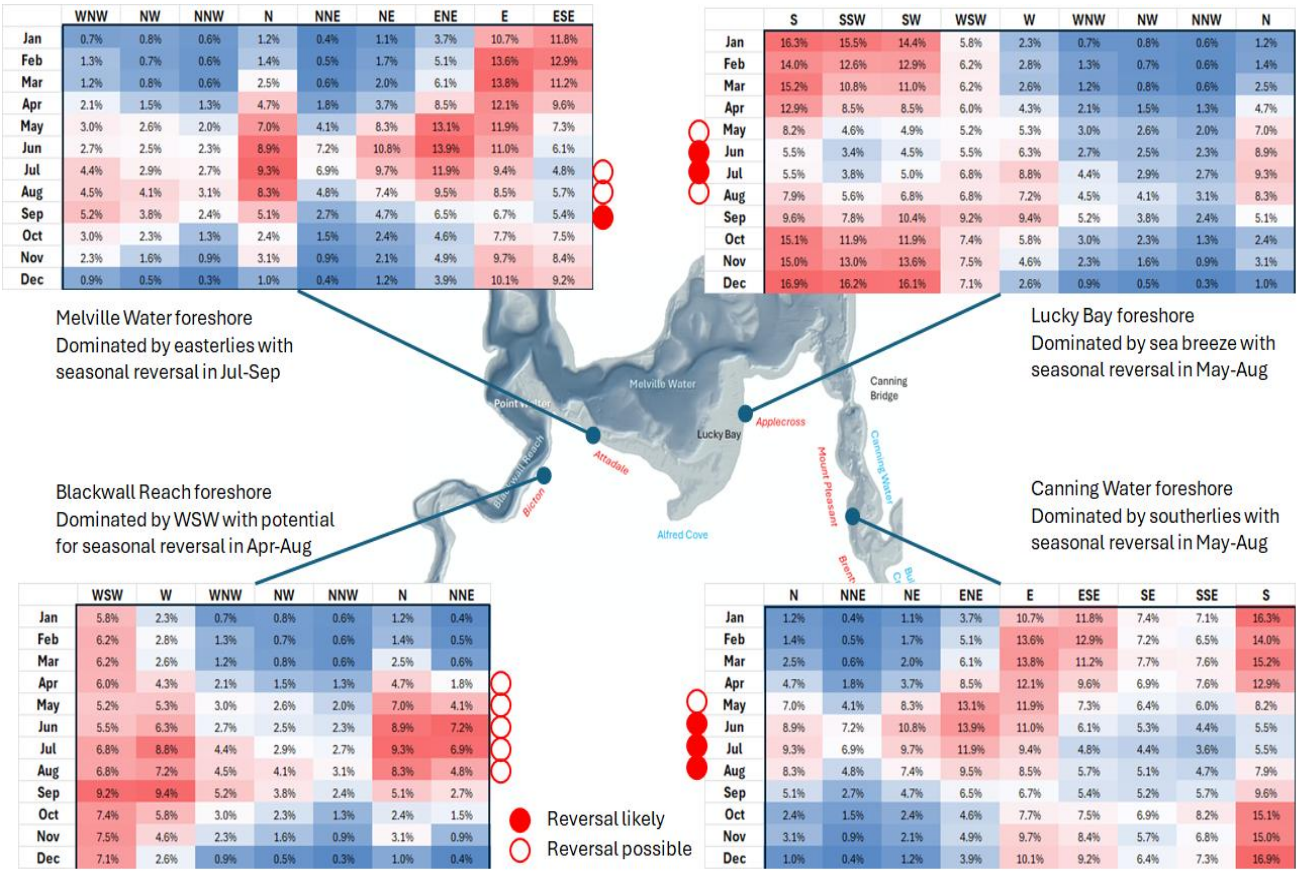


Figure 13. Seasonal variation in prevailing wind directions, relative to the foreshore orientation, creates some opportunity for fluctuating foreshore pressures

The variation in wind direction and its influence on specific foreshore areas is provided in Figure 14.



	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE
Jan	0.7%	0.8%	0.6%	1.2%	0.4%	1.1%	3.7%	10.7%	11.8%
Feb	1.3%	0.7%	0.6%	1.4%	0.5%	1.7%	5.1%	13.6%	12.9%
Mar	1.2%	0.8%	0.6%	2.5%	0.6%	2.0%	6.1%	13.8%	11.2%
Apr	2.1%	1.5%	1.3%	4.7%	1.8%	3.7%	8.5%	12.1%	9.6%
May	3.0%	2.6%	2.0%	7.0%	4.1%	8.3%	13.1%	11.9%	7.3%
Jun	2.7%	2.5%	2.3%	8.9%	7.2%	10.8%	13.9%	11.0%	6.1%
Jul	4.4%	2.9%	2.7%	9.3%	6.9%	9.7%	11.9%	9.4%	4.8%
Aug	4.5%	4.1%	3.1%	8.3%	4.8%	7.4%	9.5%	8.5%	5.7%
Sep	5.2%	3.8%	2.4%	5.1%	2.7%	4.7%	6.5%	6.7%	5.4%
Oct	3.0%	2.3%	1.3%	2.4%	1.5%	2.4%	4.6%	7.7%	7.5%
Nov	2.3%	1.6%	0.9%	3.1%	0.9%	2.1%	4.9%	9.7%	8.4%
Dec	0.9%	0.5%	0.3%	1.0%	0.4%	1.2%	3.9%	10.1%	9.2%

	S	SSW	SW	WSW	W	WNW	NW	NNW	N
Jan	16.3%	15.5%	14.4%	5.8%	2.3%	0.7%	0.8%	0.6%	1.2%
Feb	14.0%	12.6%	12.9%	6.2%	2.8%	1.3%	0.7%	0.6%	1.4%
Mar	15.2%	10.8%	11.0%	6.2%	2.6%	1.2%	0.8%	0.6%	2.5%
Apr	12.9%	8.5%	8.5%	6.0%	4.3%	2.1%	1.5%	1.3%	4.7%
May	8.2%	4.6%	4.9%	5.2%	5.3%	3.0%	2.6%	2.0%	7.0%
Jun	5.5%	3.4%	4.5%	5.5%	6.3%	2.7%	2.5%	2.3%	8.9%
Jul	5.5%	3.8%	5.0%	6.8%	8.8%	4.4%	2.9%	2.7%	9.3%
Aug	7.9%	5.6%	6.8%	6.8%	7.2%	4.5%	4.1%	3.1%	8.3%
Sep	9.6%	7.8%	10.4%	9.2%	9.4%	5.2%	3.8%	2.4%	5.1%
Oct	15.1%	11.9%	11.9%	7.4%	5.8%	3.0%	2.3%	1.3%	2.4%
Nov	15.0%	13.0%	13.6%	7.5%	4.6%	2.3%	1.6%	0.9%	3.1%
Dec	16.9%	16.2%	16.1%	7.1%	2.6%	0.9%	0.5%	0.3%	1.0%

	WSW	W	WNW	NW	NNW	N	NNE
Jan	5.8%	2.3%	0.7%	0.8%	0.6%	1.2%	0.4%
Feb	6.2%	2.8%	1.3%	0.7%	0.6%	1.4%	0.5%
Mar	6.2%	2.6%	1.2%	0.8%	0.6%	2.5%	0.6%
Apr	6.0%	4.3%	2.1%	1.5%	1.3%	4.7%	1.8%
May	5.2%	5.3%	3.0%	2.6%	2.0%	7.0%	4.1%
Jun	5.5%	6.3%	2.7%	2.5%	2.3%	8.9%	7.2%
Jul	6.8%	8.8%	4.4%	2.9%	2.7%	9.3%	6.9%
Aug	6.8%	7.2%	4.5%	4.1%	3.1%	8.3%	4.8%
Sep	9.2%	9.4%	5.2%	3.8%	2.4%	5.1%	2.7%
Oct	7.4%	5.8%	3.0%	2.3%	1.3%	2.4%	1.5%
Nov	7.5%	4.6%	2.3%	1.6%	0.9%	3.1%	0.9%
Dec	7.1%	2.6%	0.9%	0.5%	0.3%	1.0%	0.4%

	N	NNE	NE	ENE	E	ESE	SE	SSE	S
Jan	1.2%	0.4%	1.1%	3.7%	10.7%	11.8%	7.4%	7.1%	16.3%
Feb	1.4%	0.5%	1.7%	5.1%	13.6%	12.9%	7.2%	6.5%	14.0%
Mar	2.5%	0.6%	2.0%	6.1%	13.8%	11.2%	7.7%	7.6%	15.2%
Apr	4.7%	1.8%	3.7%	8.5%	12.1%	9.6%	6.9%	7.6%	12.9%
May	7.0%	4.1%	8.3%	13.1%	11.9%	7.3%	6.4%	6.0%	8.2%
Jun	8.9%	7.2%	10.8%	13.9%	11.0%	6.1%	5.3%	4.4%	5.5%
Jul	9.3%	6.9%	9.7%	11.9%	9.4%	4.8%	4.4%	3.6%	5.5%
Aug	8.3%	4.8%	7.4%	9.5%	8.5%	5.7%	5.1%	4.7%	7.9%
Sep	5.1%	2.7%	4.7%	6.5%	6.7%	5.4%	5.2%	5.7%	9.6%
Oct	2.4%	1.5%	2.4%	4.6%	7.7%	7.5%	6.9%	8.2%	15.1%
Nov	3.1%	0.9%	2.1%	4.9%	9.7%	8.4%	5.7%	6.8%	15.0%
Dec	1.0%	0.4%	1.2%	3.9%	10.1%	9.2%	6.4%	7.3%	16.9%

Figure 14. Relative occurrence of onshore winds.

5.4.5 River Flow

Flow conditions across the foreshore are generally moderate, with wind and water levels exerting more influence on shoreline dynamics than tidal currents.

The combination of deep, relict structures and a microtidal setting determines that currents along Melville foreshore are small to moderate, with wind waves and water levels providing crucial drivers to foreshore stresses.

5.5 VEGETATION AND FLORA

5.5.1 Vegetation Complexes

Vegetation complexes are broad-scale vegetation units characterised by recurring plant communities within specific landform-soil units. While plant communities can appear in multiple complexes, the proportion of these communities differs across each complex.

Three vegetation complexes occur on the foreshore and its reserves. The western end of the site supports the Cottesloe Complex, transitioning to the Karrakatta Complex in the middle, and then the Bassendean Complex to the east. The overall vegetation complex descriptions as mapped by Heddle *et al*. (1980) with updates from Webb et al. (2016) are outlined in (Table 1).

Table 1. Vegetation complexes within the geomorphic units and their attributes

Attribute	Spearwood Dunes		Bassendean Dunes
Complex	**Cottesloe - Central and South**	**Karrakatta - Central and South**	**Bassendean - Central and South**
Soil	Brown and yellow sand over limestone	Yellow sand, no limestone near the surface	Pale grey or grey sand
Vegetation	Mosaic of woodland of *Eucalyptus gomphocephala* and open forest of *E. gomphocephala – E. marginata – Corymbia calophylla*; closed heath on the Limestone outcrops	Predominantly open forest of *E. gomphocephala – E. marginata – C. calophylla* and woodland of *E. marginata – Banksia* species.	Vegetation ranges from woodland of *Eucalyptus marginata – Allocasuarina fraseriana - Banksia* spp. to low woodland of *Melaleuca* species and sedgelands on the moister sites.
Location	Foreshore west of Blackwall Reach	The majority of the Swan Estuary foreshore from Blackwall Reach until Canning Bridge	Canning River foreshore, south-east of Canning Bridge, and Bull Creek

The pre-European extent of these vegetation complexes remaining in the Swan Coastal Plain is:

- 32.16 % of the Cottesloe Complex – Central and South;
- 23.49 % of the Karrakatta Complex – Central and South;
- 26.87 % of the Bassendean Complex – Central and South (Government of Western Australia, 2019)

The pre-European extent of these vegetation complexes remaining in the City of Melville is:

- 0.42 % of the Cottesloe Complex – Central and South
- 4.70 % of the Karrakatta Complex – Central and South
- 7.82 % of the Bassendean Complex – Central and South (Government of Western Australia, 2019).

Based on the pre-European vegetation status, prioritisation for conservation and restoration activities should be placed on Cottesloe Complex – Central and South, given that only 0.42% of the original

vegetation for this complex remains within the City. Similarly, due to <30% of Karrakatta and Bassendean Complex vegetation remaining on SCP, revegetation within land occupied by these complexes is high, especially given <5% of Karrakatta and 8% of Bassendean Complex vegetation still remains within the city.

5.5.2 Vegetation Types

Vegetation within the foreshore was described based on dominant species and the structure of the vegetation. The most recent assessment by NAMS has recorded twenty-two vegetation types across the foreshore area (NAMS, 2024). These vegetation types reflect the diverse hydrogeological conditions of the foreshore, as well as historical and current disturbances that have led to the loss of original plant communities and the creation of novel communities through revegetation.

Figure 11 shows the distribution of vegetation communities within the foreshore zone with full descriptions provided in Appendix 6 . The 'Parkland Cleared' category is not shown in the figure as it occupies most of the foreshore and consists of turf with various trees mostly non native) and detracts from showing vegetation that contains native WA species. While vegetation structure and extent will change over time due to maturation of vegetation and additional restoration projects, the dominant species composition that makes up the vegetation community is unlikely to change in the short to medium term. As such, this information is presented here rather than the assessment results.

5.6 FAUNA

The City of Melville's foreshore supports a diversity of fauna habitats across riparian and woodland ecosystems, providing refuge for both terrestrial and aquatic species. Key habitat types include:

- **Sedgelands and Estuarine Samphire Wetlands** – Sedgelands bordering the foreshore, along with the nationally listed samphire shrublands at Alfred Cove, support a range of wading birds, reptiles, and small mammals and provide seasonal roosting and feeding grounds for migratory bird species.
- **Remnant Tuart Woodlands** – Located at Blackwall Reach and Heathcote Reserves, these woodlands form part of a critically endangered ecological community and offer essential canopy habitat, particularly for Black Cockatoos.
- **Casuarina and Melaleuca Woodlands** – Found in selected areas of the foreshore, these woodlands provide important roosting, foraging, and nesting sites for native birds and insects.
- **Revegetated Coastal Shrublands** – Areas planted with native species such as Acacia and Scaevola improve habitat structure and offer transitional zones between natural ecosystems and urban development.
- **Standing Dead Trees and Hollow-bearing Trees** – provide nesting sites for birds and bats and enhance overall habitat complexity.

Collectively, these habitats support significant avian diversity and contribute to the designation of the Melville Bird Sanctuary, reinforcing the ecological value of the area within the Swan Canning Riverpark.

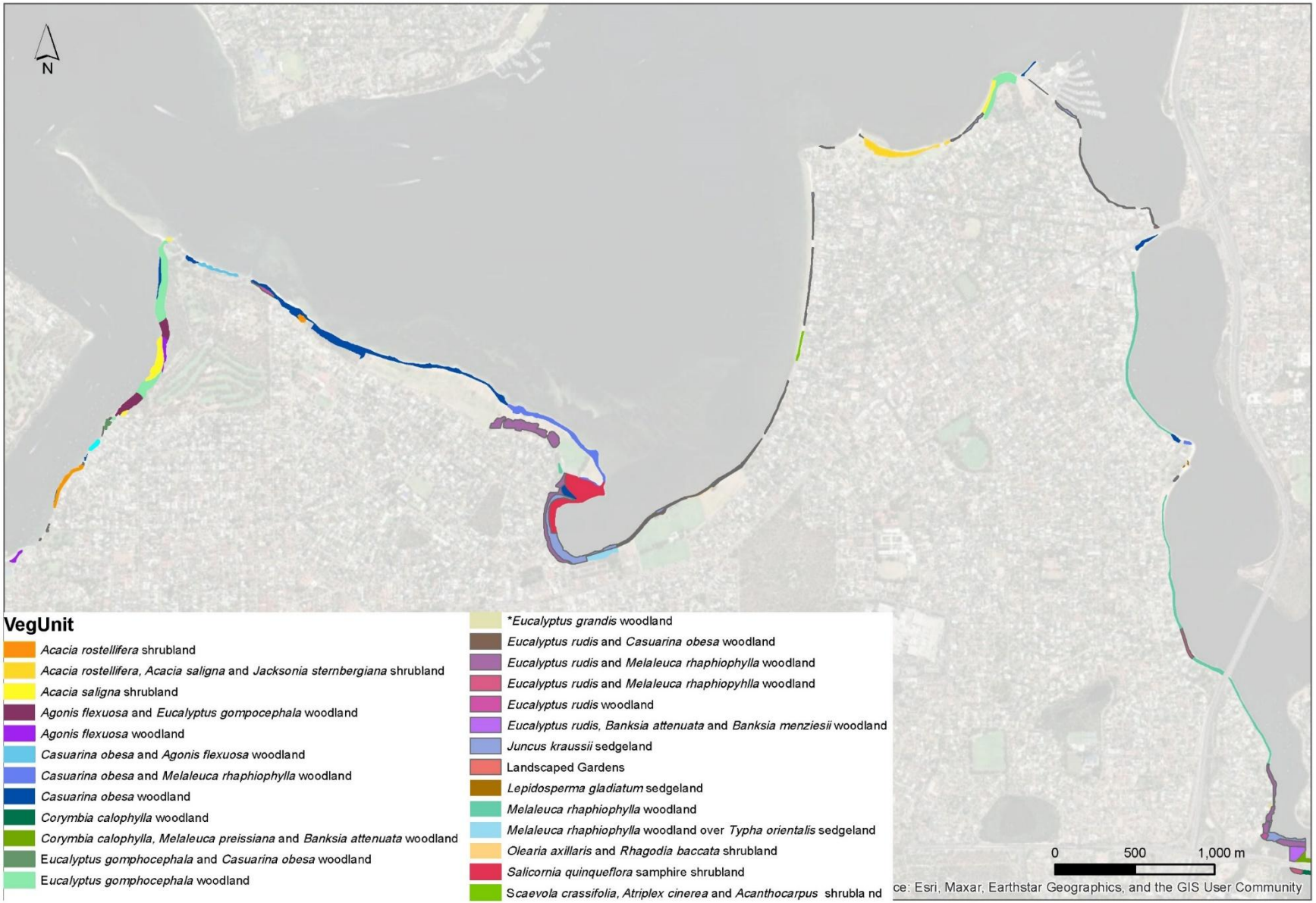


Figure 15. Vegetation types in the foreshore area (after NAMS, 2024).

5.7 CONSERVATION SIGNIFICANT VEGETATION COMMUNITIES AND FLORA

5.7.1 Threatened and Priority Ecological Communities

Ecological communities are discrete, naturally formed assemblages of plant and animal species, whose composition and distribution are primarily determined by soil type, position in the landscape and water availability (DCCEEW, 2025). One threatened ecological community was identified in the upland sections of the foreshore area at Blackwall Reach Reserve: *Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community* (listed as Critically Endangered under the EPBC Act). Two patches are present within the survey boundary, totalling 4.1 hectares, which are part of a larger patch estimated to be greater than 10 hectares. A Tuart patch in Goolugatup Heathcote Reserve requires a detailed survey to confirm if it qualifies as the EPBC Act-listed ecological community (NAMS, 2024). A detailed survey and analysis are required to determine if this community also qualifies as the Priority 3 BC Act Southern *Eucalyptus gomphocephala-Agonis flexuosa* woodlands priority ecological community (FCT 25).

Subtropical and Temperate Coastal Saltmarsh, listed as Vulnerable under the EPBC Act and Priority 3 under BC Act, is present at Alfred Cove and extends further along various foreshore sections in Attadale Reserve, Tompkins Park and Coffee Point Reserve. While no confirmation of the FCT 24 *Northern Spearwood shrublands and woodlands* (P3 in WA, part of TEC Tuart Woodland under EPBC Act) was made in the past, elements of this community are present in the Blackwall Reach Reserve. The vegetation is described as heath with scattered *Eucalyptus gomphocephala*, and understorey typically consisting of *Banksia sessilis, Calothamnus quadrifidus* and *Schoenus grandiflorus*. Other common species include *Hardenbergia comptoniana, Xanthorrhoea preissii*, *Conostylis aculeata* and *Lomandra maritima* (Gibson et al. 1994). Based solely on this flora assemblage, this community is most likely part of the identified Tuart Woodland community at Blackwall Reach Reserve.

5.7.2 Groundwater Dependent Ecosystems

According to the Bureau of Meteorology's Groundwater Dependent Ecosystems Atlas (2025), the Attadale Foreshore and part of the Troy Park Bushland and Bateman Park are classified as having a high potential to be groundwater dependent ecosystems (GDEs). Blackwall Reach is identified as having moderate potential, while Point Walter Reserve is classified as having moderate potential in lower-lying areas and low potential in elevated areas near the golf course. Jeff Joseph Reserve is not classified as having the potential to support a GDE, likely due to the low elevation profile. Given that several areas of the Canning River foreshore, particularly the southern section, contain groundwater-dependent species such as *Melaleuca rhaphiophylla*, this section of the foreshore, although narrow and fragmented, can be mapped as being part of a GDE.

5.7.3 Bush Forever

Bush Forever sites are regionally significant bushland and wetland areas on the Swan Coastal Plain subject to non-statutory protection (Government of Western Australia, 2000). The foreshore area encompasses three Bush Forever Sites - Site 331 *Blackwall Reach, Point Walter, Alfred Cove and Adjacent Bushland, Bicton to Applecross Attadale; Point Heathcote Foreshore* (Site 329), and *Yagan Wetland and Adjacent Bushland* (Site 338) (Figure 16). Bush Forever sites are recognised as a vital

habitat for various flora and fauna, including migratory birds protected under international agreements and offering recreational spaces for the community.

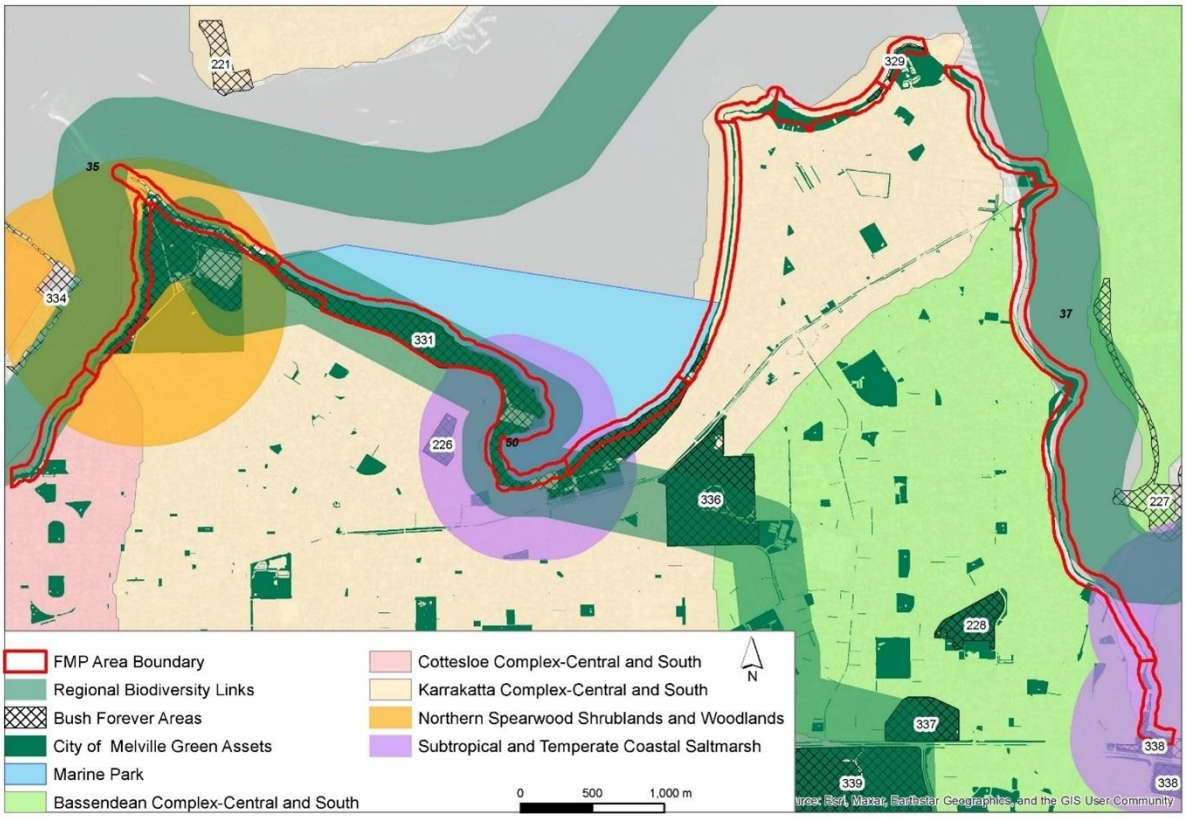


Figure 16. Conservation of significant elements of the foreshore, including Bush Forever sites, regional ecological linkages and priority ecological communities.

5.7.4 Ecological Linkages

Ecological linkages provide essential refuge and movement corridors for fauna between natural bushland areas, increasing the extent of available habitat and supporting genetic diversity. Within the City, Blackwall Reach, Point Walter Reserve, Attadale Foreshore and Troy Park form part of Regional Linkage No. 50, which connects with Wireless Hill and other significant Bush Forever sites to the east. This linkage is rated as Very High in value under the NAAMP, while the Bull Creek corridor is rated High (CoM, 2019).

Although the foreshore provides some connectivity through the urban landscape, its effectiveness is constrained by extensive open grassed areas and degraded habitats, despite notable improvements achieved in recent years. In this fragmented environment, sites such as Alfred Cove, Bull Creek and Blackwall Reach are especially valuable for their high-quality remnant vegetation. Narrow or rehabilitated strips of vegetation are also becoming increasingly important as connectors between these habitat patches. Continued revegetation and maintenance of these areas are therefore critical to sustaining ecological functions, enhancing foreshore stability, and improving amenity.

5.7.5 Threatened and Priority Flora

A total of 106 conservation-significant flora species occur within 10 kilometres of the foreshore (NAMS, 2024). Of these, 29 species are considered to have habitat within the foreshore area boundary and

could be considered for reintroduction. During the survey, two conservation-significant flora were recorded (NAMS, 2024):

- Hackett's Hopbush (*Dodonaea hackettiana*) – Priority 4 under the BC Act.
- Spider Net Grevillea (*Grevillea thelemanniana*) – Threatened under the BC Act and Critically Endangered under the (EPBC Act).

5.7.6 Riparian Species and Dynamics of Riparian Foreshores

The majority of the City's foreshore contains riparian vegetation dominated by Sea Rush (*Juncus kraussii*), with sedges of *Machaerina juncea*, *Schoenoplectus tabernaemontani* and *Typha orientalis* being other typical understory. Trees including paperbark *Melaleuca rhaphiophylla, Casuarina obesa* and *Eucalyptus rudis*) grow along the bank edge to form the upper layer. The distribution of species along the bank is influenced by their tolerance to inundation, salinity and damage by trampling, pollution, boating/wind waves, soil substrate composition and depth and drought. Specific areas of the foreshore associated with springs/groundwater discharge (ad or creeks/wetlands) from the large sand dunes (refer to Sections 5.2 and 5.4.2) give rise to freshwater species close to the otherwise brackish to saline environment of the riparian edge, such as the narrow foreshore area along the lower Canning River.

Different site characteristics typically result in the development of vegetation zones, and in the foreshore stabilisation sense, are generally characterised by wave stress and inundation (Figure 17). Inundation-tolerant species (generally sedges e.g. *Juncus, Machaerina, Schoenoplectus*) typically occupy the upper intertidal to supratidal zones, which are subject to pressure from tides, waves, storms, tides and human induced disturbance (trampling, clearing and or weeds).

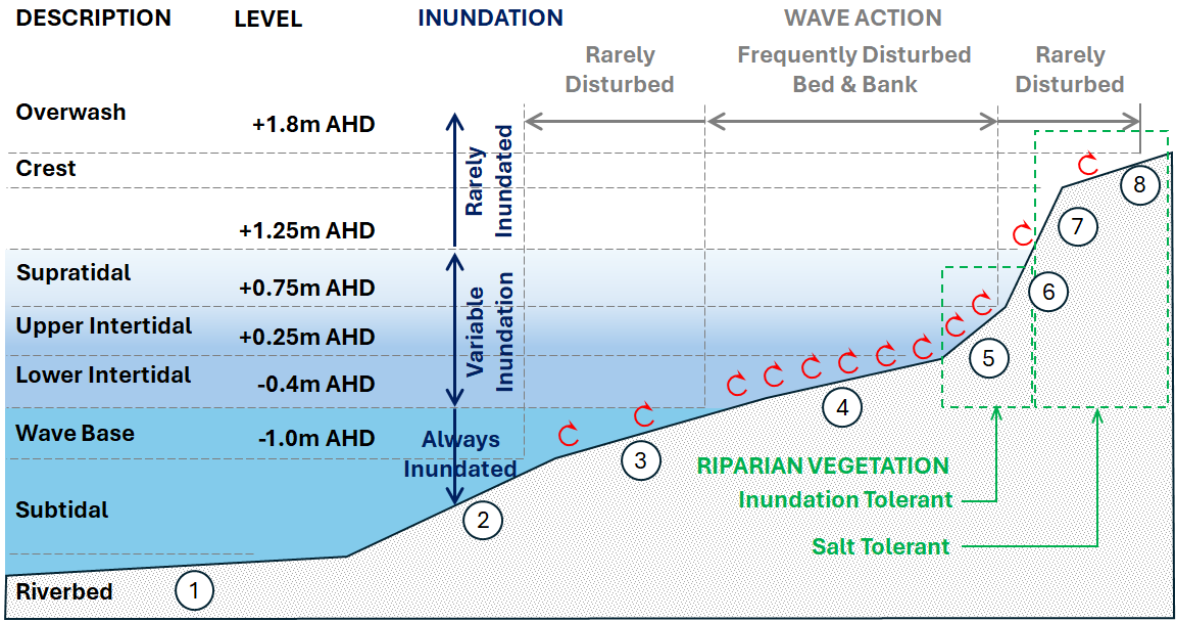


Figure 17. Foreshore zonation.

The root depth and structure of each species determine their ability to resist erosion and bank undermining. This capacity is reduced where vegetation is immature or the foreshore slope is steep (Figure 18), although soil composition is also a key factor. Well-established riparian vegetation, especially where multiple species form a dense mix, can tolerate short-term erosion pressures. However, under sustained erosion pressure, only plants with extensive root systems provide effective resistance, as juvenile plants struggle to establish on steep or unstable slopes.

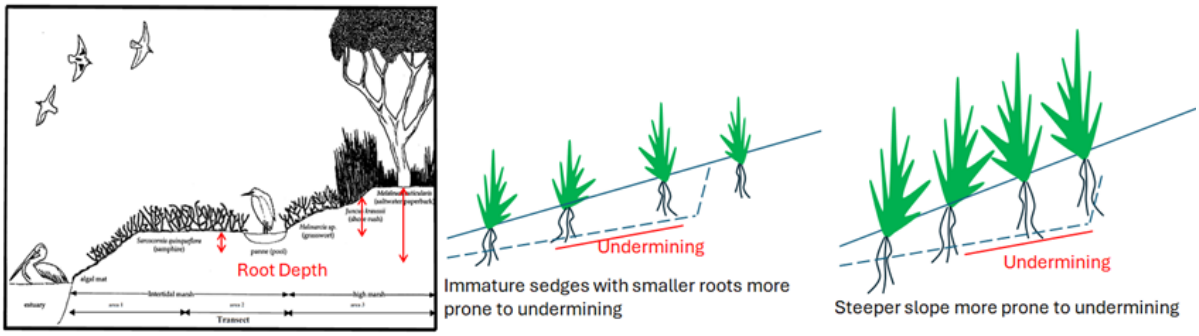


Figure 18. Interaction of root depth with stability.

Robust stands of sedges or salt-tolerant trees can act as natural anchoring points along the foreshore, providing alongshore stability and limiting lateral movement of the shoreline between these points (Figure 19). The areas between these stable sections often support younger or less robust vegetation, allowing a natural succession of riparian plant communities to establish over time. The loss of anchoring vegetation, such as mature trees along the Attadale foreshore, can trigger progressive shoreline retreat. This process typically follows a sequence of erosion initiation, scalloping, and eventual linking of eroded sections, leading to broader foreshore instability.

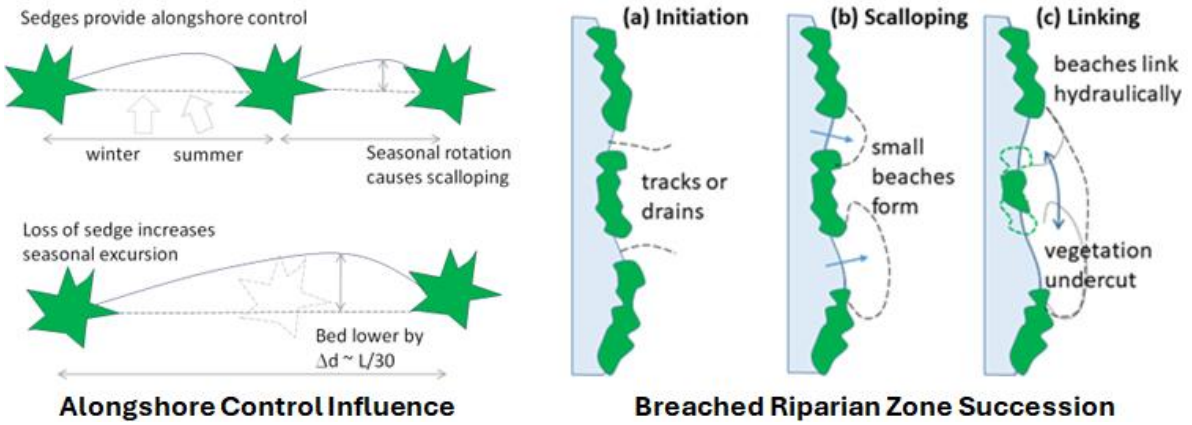


Figure 19. Alongshore control influence and effect of discontinuity.

To guide the management of foreshore reserves containing riparian vegetation, a simplified decision framework is proposed (

Figure 20). This framework considers key factors such as wave climate, erosion pressure, existing vegetation condition, and the available width for foreshore planting to assist in identifying suitable management and stabilisation approaches.

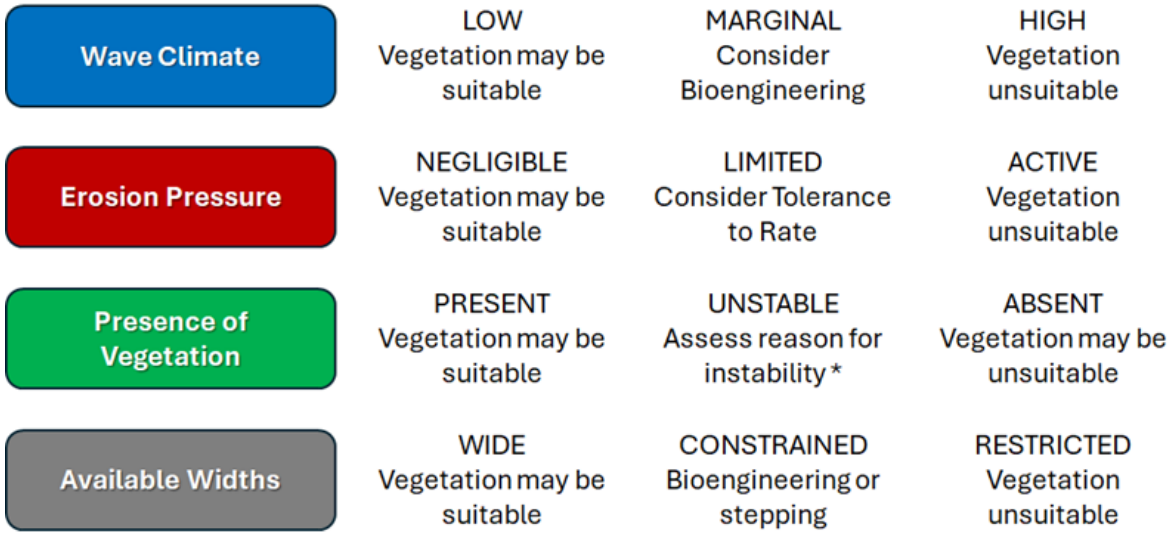


Figure 20. Simplified decision basis for use of riparian vegetation.

6.0 CULTURAL AND SOCIAL CONTEXT

6.1 ABORIGINAL HERITAGE VALUES

The Department of Planning Lands and Heritage (DPLH) holds database records of Registered Sites and Other Heritage Places. Under the *Aboriginal Heritage Act 1972* (AHA), a 'Registered Site' is defined as a place or an object that has been assessed as a site under Sections 5 and 39 of the AHA, and 'Other Heritage Places' are those places or objects that have been recorded but not assessed. Based on these records, the foreshore area is directly abutting Swan River (Site ID 3536), Canning River (Site ID 3538) and Goolugatup (Site ID 18623) registered sites.

Swan River and Canning River are widely recognised heritage sites of high cultural and spiritual significance to the Noongar people and are believed to be the path and the resting place of Waugal, a giant Rainbow Serpent. In protecting this heritage, the path (riverbed) and associated springs, wetlands, and lakes should not be disturbed, and wherever possible, the areas adjacent to the riverbed should be kept in their natural form, and the vegetation should consist of locally endemic species.

Goolugatup (ID 18623) encompasses a small area called Lowlands just south west of the Yacht Club significant as a birthplace, camp, ritual/ceremonial, creation/dreaming narrative, historical, hunting place, meeting place, landscape/seascape feature, plant and water source.

Working in or adjacent to areas of high significance requires appropriate consultation and approvals under the AHA (Section 18) and the use of monitors for any ground disturbance works. Other sites of aboriginal significance that are not registered but need further investigation or are historical sites are:

- Blackwall Reach, Bicton (ID 3650) – water source. "Jenalup": place where the feet make a track;
- Burke Drive (ID 4104) – artifacts/scatter;
- Warragoon Crescent (ID 4105) – artifacts/scatter; and
- Raffles Hotel Site (ID 20442) – sub surface cultural material, artefacts/scatter, birthplace, camp, ritual/ceremonial, creation/dreaming, narrative, fish trap, historical, hunting place, meeting place, ochre, plant resource, quarry, rock shelter, and shell.Bull Creek, Perth (ID 3299) – sub surface cultural material, artifacts/scatter;

The mapped extent of registered heritage sites associated with the Swan and Canning rivers is outlined in Figure 21 alongside registered sites of European heritage significance.

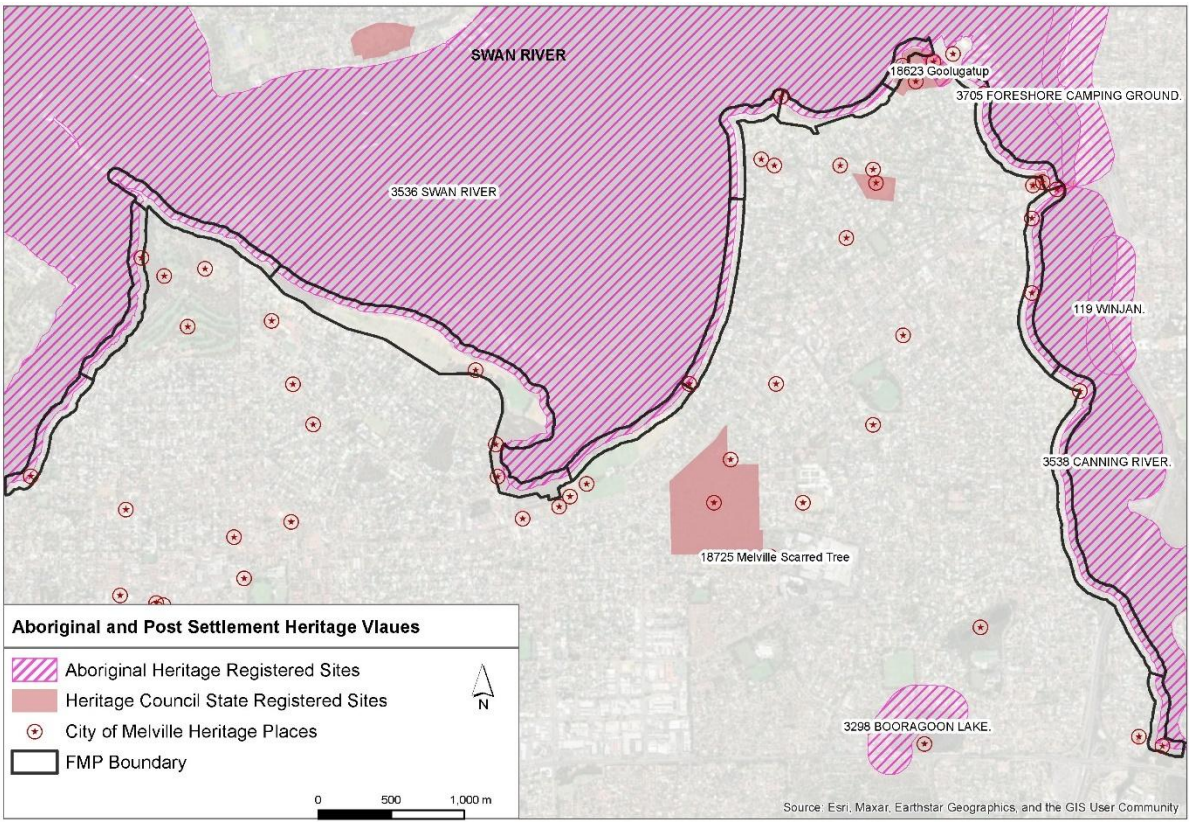


Figure 21. Location and extent of heritage sites of Aboriginal and European significance.

6.2 POST SETTLEMENT / EUROPEAN HERITAGE VALUES

The following post-settlement / European cultural heritage places occur within or directly adjacent to the foreshore boundary (DPLH, 2025c):

- Bicton Foreshore and Reserves, including Stam's Tearooms Site (Place No. 06071);
- Point Walter Reserve, Point Walter Golf Course and Blackwall Reach Reserve (Place No. 25434);
- Attadale Reserve and Troy Park (City of Melville Heritage list (CoM, 2019);
- Swan Estuary Marine Park and Adjacent Nature Reserves (Place No. 23995)
- Alfred Cove (Place No. 6052);
- German Jetty Site (former) (Plance N. 06059);
- Point Dundas, Majestic Hotel Site, Boardwalk and Applecross Jetty (Place No. 6054);
- Raffles Hotel (Place No. 1544)
- Point Heathcote Lower Land (Place No. 25384)
- Coffee Point Boatyard/Slipway/Wharf (Place No. 06061)

- Canning Bridge (Place No. 16178);
- Deep Water Point Reserve, including Jetty and Sculpture Park (Place No. 25431);
- Rookwood Street Jetty and Foreshore (Place No. 17800); and
- Bateman Reserve (Place No. 25432).

6.3 FACILITIES

The foreshore functions as both a regional and local asset, with the level of facilities provided reflecting its position in the parks hierarchy.

Regional assets such as Point Walter and Deep Water Point attract high visitation and serve a broad catchment. These sites justify a higher standard of infrastructure, including cafes, toilets, showers, and drinking fountains, to support longer visits and a wide range of recreation activities.

In contrast, most other foreshore reserves are neighbourhood or local assets, with facilities provided at a lower level to reflect their intended use. For example, Attadale Reserve offers limited seating but no toilets or drinking fountains, making it suitable for short visits and informal recreation such as dog exercise. A number of other sites provide toilets, but generally at a smaller scale appropriate to their function.

The Principal Shared Pathway extends along most sections of the foreshore and serves as a vital link for pedestrians and cyclists. User conflicts are evident across the network, particularly where path widths are limited, such as through Blackwall Reach Reserve and at Goolugatup. However, width alone is not the determining factor, as conflicts are also observed in areas with separate paths, such as Tompkins Park. This suggests that improved public education, wayfinding, and signage are required to promote safe and considerate use of the shared path network.

Recreation activity is also spatially defined. Water sports (e.g. sailing, windsurfing, and jet skiing) are concentrated at either end of the Marine Park—Bicton to Point Walter and Melville Beach Road to Deep Water Point Reserve—where conditions are favourable.

Fishing is concentrated at Blackwall Reach Reserve, supported by cliff access and purpose-built platforms that include fishing line bins. These bins are also available at other popular fishing spots in the City.

6.3.1 Signage

There are a number of interpretive signs and nodes along the foreshore. River Journeys Interpretation Nodes at Bicton Baths, Point Walter, Goolugatup (upland trail only, not directly on foreshore) and Bull Creek provide interpretation of key areas connected to Whadjuk places. These nodes form part of a wider network of nodes within the Swan-Canning Riverpark and are integral to the river story.

Figure 22. Examples of signage and interpretive nodes along foreshore.

Interpretive signage featuring text regarding natural values of the river shoreline is present throughout, but they are aging, and the placement is not always conducive to being easily observed due to the growth of vegetation. There are also several signs representing settler / European history (e.g., German Jetty), and these are generally presented as brass plaques.

6.3.2 Art and sculptures

A number of sculptures and art montages are placed along the foreshore, with key elements at Attadale Foreshore and Jeff Joseph Reserve. These elements contribute to the interest and enjoyment of the public visiting these areas.

Figure 23. Examples of sculptures along the Attadale foreshore.

6.4 COMMUNITY INTEREST IN FORESHORE MANAGEMENT

6.4.1 Environmental Volunteer Groups

There are four environmental groups operating within the foreshore area:

- Bicton Environmental Action Group (BEAG),
- Swan Estuary Reserves Action Group (SERAG),
- Friends of Applecross Foreshore (FO Applecross FS)
- Friends of Melville Bird Sanctuary (FMBS).

BEAG works in Blackwall Reach and along the Blackwall Reach Parade foreshore of Bicton. Works include restoration and erosion control, holding regular working bees and planting days throughout the year.

Jeff Joseph Reserve has held several large community planting days in conjunction with the Applecross Primary School, Waylen Bay Scouts Club and Applecross Rotary Club. As of 2022, there is now a Friends of Applecross Foreshore, FO Applecross FS, operating in this area.

SERAG work across DBCA and the City of Melville land in the Attadale area, including Troy Park, Alfred Cove and Tompkins Park. Works include restoration and erosion control, as well as holding regular workdays and planting days throughout the year. Tremendous Tuesdays is a weekly workday event hosted in the City of Melville area, incorporating a variety of activities. SERAG's support in maintaining foreshore areas has resulted in significant improvements in foreshore stability and flora diversity across time

In June 2023, the City endorsed the Melville Bird Sanctuary (MBS), which has been championed by FMBS. The MBS covers two distinct areas. The Eastern region includes estuarine reserves across Attadale, Alfred Cove and Applecross, and the Western Region includes Blackwall Reach Reserve and Blackwall Reach Parade foreshore as shown in Figure 24.

While the MBS itself does not confer new statutory protections beyond existing designations, it builds upon areas already recognised for their environmental significance. Notably, portions of the sanctuary overlap with the Alfred Cove A-Class Nature Reserve and the Swan Estuary Marine Park, both of which are protected under state legislation. Most recently bird viewing platform was installed at Point Waylen and Troy Park, along with interpretive signage to educate visitors about the birdlife in the area.

Figure 24. Melville Bird Sanctuary boundaries for the east and west regions(Source: City of Melville).

6.5 UTILITIES AND INFRASTRUCTURE

The foreshore is intersected by various services and infrastructure. Power, water, sewer and gas can be found at or in proximity of some reserves and stormwater outlets are dotted along the entire foreshore. Lighting is also commonly found, particularly along the Canning River Foreshore. Pathways, boat ramps, carparks and buildings also form part of the foreshore as well as park furniture. While infrastructure elements are not discussed in the FMP in terms of management, it is crucial that any works (maintenance or capital works) be conducted with knowledge of these, and as a minimum Dial Before You Dig search be conducted during the planning and implementation stages of works (this includes planting works also). Close liaison with relevant authorities and service providers, such as the Water Corporation, is required to support long-term strategic planning and implementation of managed retreat, ensuring that infrastructure planning, drainage management, and foreshore adaptation measures are coordinated and sustainable.

6.6 SUMMARY OF KEY VALUES

The key values of the City's foreshore can be allocated across three asset categories: ecological, cultural, and infrastructure.

Ecological:

- **Vegetation** - particularly remnant vegetation which forms part of Bush Forever Sites 331, 329 and 338 and the Regional Biodiversity links.
- **Fauna habitats** – important for migratory birds as well as local fauna.

- **Estuarine Wetlands -** Includes saltmarsh-dominated peripheral estuarine wetlands at Alfred Cove, listed as nationally listed as Vulnerable under the Australian Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and borders ecologically significant Swan Estuary Marine Park.

- **Ecosystem services** - buffering against storm surges and flooding, assisting in carbon sequestration, pollutant trapping and urban heat reduction.

Cultural and Social Values

- **Aboriginal Significance** - The foreshore is part of the Swan Canning Rivers and has spiritual importance to Aboriginal people.

- **Historical significance** - there are numerous historical sites of significance along the foreshore.

- **Amenity and Recreation** - high recreational and social values connected to the environment – e.g. walking, water sports, gatherings and passive recreation.

- **Educational value** – a living classroom for schools, universities, and environmental programs.

- **Economic value** - through tourism, recreation, and associated local businesses.

Infrastructure

- **Erosion Control structures** - like walls, revetments, gabions, groynes, and bioengineered systems (e.g., brushwalls) help protect key infrastructure (roads, paths) and vegetation and foreshore integrity.

- **Built recreational assets** – includes pathways, jetties, boat ramps, bird viewing platforms etc. providing access for boating, walking, running, bird watching, sporting fields and associated buildings, water sports, fishing and other activities (e.g. cafes BBQs etc).

- **Services and utilities** – power, sewer, water, gas and telecommunications.

- **Transport infrastructure** – e.g. roads and carparks.

PART B: FORESHORE ASSESSMENT 2025

The section of the FMP outlines the following:

- Methods used for assessment (with reference to relevant appendices);
- Summary of investigations and the community consultation;
- Review of 2019 management actions;
- Prioritisation of five projects for the FMP management.

7.0 METHODS

To ensure consistency with previous foreshore assessments, the current methodology has been aligned with the site inventory and ecological assessment framework outlined in the 2019 Foreshore Restoration Strategy. This approach adopts the same foreshore segments and assessment methodology used for Foreshore Condition Assessment, as coordinated by the Department of Biodiversity, Conservation and Attractions (DBCA) since 2004.

Previous assessments of the foreshore have generally been conducted at five-year intervals, with each survey covering most of the foreshore area (ATA 1997; NAMS 2009; GHD 2014; GHD 2019a). However, assessment and reporting have been undertaken with changing reference frameworks, generally transitioning from large-scale foreshore sections towards asset-level assessment. A recently completed condition assessment of aquatic assets for the City of Melville (MP Rogers, 2024) included condition ratings for foreshore protection works and estimated costs for rectification to the original condition. However, it did not present consequences or outline values beyond those of the structures themselves.

To effectively assess foreshore amenity, infrastructure, and protection systems - especially in areas facing significant erosion, an evaluation at a finer, continuous spatial scale along the entire foreshore was necessary. This assessment was based on the shoreline segments and built assets previously rated by GHD (2019a).

Importantly, management priorities extend beyond just the shoreline and built infrastructure, and at a minimum, incorporate the area between the shoreline and the adjacent pathway or a road. They also consider the broader network of the City's green assets, incorporating natural, cultural, and recreational/social values as outlined in the City's Natural Areas Asset Management Plan (NAAMP). These values informed the overall prioritisation of sites for protection and restoration for this FMP.

7.1 DESKTOP STUDY

The desktop study included a review of the documents and data supplied as outlined under the scope (Section 2.1). As substantial foreshore assessment work, such as vegetation mapping (NAMS, 2025), hard asset evaluation (MP Rogers, 2024), and community consultation (CoM, 2024), was undertaken

in late 2024 and early 2025, the purpose of the desktop review was to summarise those findings rather than duplicate them in this FMP.

A review of the 2019 Foreshore Strategy (GHD, 2019a) was also conducted to extract recommendations and management actions relevant to the past five years so that these can be assessed in light of the current foreshore condition and revised for the next 5 year term of the FMP.

Changes and updates to the City of Melville strategic plans, as well as DBCA River Protection Strategy for Derbal Yirragan Djarlgarro (Swan - Canning River system), were reviewed to ensure all values and management objectives align across all plans and cross-link to Council Plan outcomes. Any data gaps were noted for follow-up during field investigations.

7.2 FIELD INVESTIGATIONS

As with previous reviews of the Foreshore Management Strategy (GHD, 2019a), a qualified ecologist and coastal engineer conducted a detailed field assessment of the City of Melville foreshore. This assessment involved walking the length of the foreshore from East Fremantle Yacht Club in Bicton to Bateman Park in Brentwood (excluding the South Perth Yacht Club area, which is managed by the club itself) to record foreshore condition and identify areas requiring management attention. These assessments took place on 11 and 12 March 2025.

The vegetation surveys were completed by Natural Areas ecologists in October 2024 (NAMS, 2024), mapping vegetation types, condition, weed infestations, tree health, and areas of revegetation. Building on this, Syrinx Consulting's ecologist undertook ground-truthing during the March 2025 site visit, with a focus on identifying management actions for each sub-precinct.

In addition to ecological observations, erosion patterns and vegetation responses were recorded to support prioritisation and inform the development of future foreshore restoration concept plans. A follow-up visit was conducted on 7 April 2025 (a weekend) to gain a better understanding of how the community utilises specific areas and the pressures these activities place on the foreshore environment. Further assessments were undertaken

Both the ecologist and coastal engineer assessed erosion impacts on natural areas and hard infrastructure, documenting the type and extent of damage along with a condition rating.

Brief details of the assessment methods used for both natural and built elements are provided below. These methods, as well as those used for the overall site assessment, largely align with those used in the 2019 GHD strategy, with some minor updates to the coastal assessment methodology, briefly outlined below.

7.2.1 Flora and Fauna Assessment

Flora and Fauna Assessment was conducted by Natural Areas Management Services (NAMS) between 4th November and 11th December 2024. The assessment was conducted for the foreshore area and the 50 m buffer on either side of the City of Melville boundary and included:

- **Desktop Review:** A preliminary desktop study was conducted to provide environmental context and inform fieldwork. Key objectives included identifying likely native, introduced, and

conservation significant flora and fauna species and assessing potential presence of Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs). To do this work, a range of databases were used alongside Foreshore Restoration Strategy Review (GHD, 2019a) information on vegetation, flora and fauna.

- **Flora survey** - All accessible areas of the foreshore were traversed on foot using a 30 m x 30 m grid. All flora (i.e. native, introduced/ weeds).were recorded during traverses as well as the vegetation condition (using Keighery (1994) scale), and structure. Weed mapping was conducted based on density and cover for the City's target weed species within each 30 m segment of the foreshore, and cover classes of <5%, 5–25%, and >25% used to conduct mapping.

- **Fauna survey:** - Fauna assessment was conducted concurrently with the flora survey using a basic fauna assessment approach (EPA 2020). Fauna presence was recorded via direct sightings, scats, tracks, and acoustic monitoring. Targeted nocturnal surveys were conducted at Blackwall Reach Parade, Troy Park and Thomas Middleton Park using spotlighting, thermal imaging, and bat detectors (number of events not disclosed).

- **Tree Health Assessment** – all trees >2 m in height and DBH >100 mm were recorded using GPS and assessed using Clifton et al. (1988) methodology based on crown size, density, dead branches, and epicormic growth and signs of disease and/or pests such as Polyphagous shot-hole borer (PSHB).

- **Rehabilitation Site Mapping** – was conducted to identify potential areas for revegetation based on bare /low vegetative cover, impacts of informal access disturbance, weed cover and disturbance.

- **Data Analysis and Reporting:** Vegetation was analysed and classified into different types using NVIS Level V standards. Detailed vegetation condition maps and weed maps can be found within the NAMS (2024) report – this FMP presents summary maps and key data within the results and appendices sections of this Plan.

  A comparative analysis of flora and fauna results from NAMS (2024) was undertaken against earlier assessments, including the Estuarine Reserves Management Plan (NAMS, 2000) and the previous Foreshore Management Plan (GHD, 2019a). This comparison considered species diversity and the influence of past foreshore management works on ecological change. However, as the mapped areas differ between assessments, these results should be interpreted as indicative rather than absolute.

  More robust comparisons will be possible once foreshore asset boundaries are formally delineated through detailed surveys, asset mapping, and classification, and when clear goals and objectives are established for each asset—such as target species composition, weed control priorities, and canopy or vegetation cover targets.

7.2.2 Foreshore Asset Assessment

Foreshore asset assessment followed the most recent methodology applied to the DBCA foreshore asset database, initially developed as part of the *Foreshore Assessment and Management Strategy* (FAMS) (SRT, 2008), which has been subject to updates through progressive application. The database outlines 'Built' and 'Natural' foreshore assets, referring to sections of the foreshore containing natural, bioengineered, or hard engineered shoreline (e.g. walls, revetments, and rock rip rap). The assets are determined at different spatial scales and may overlap if a small built asset is contained within a larger 'natural' reach (e.g. a rock rip rap around a tree). These assets are also referred to as foreshore segments.

Previous assessment of the Melville foreshore (GHD 2014, 2019a) was undertaken using the rating scheme used for maintenance of the DBCA database. The original spatial framework and built / natural classes were applied without any modification (e.g. the original reaches were maintained, regardless of whether new structures were installed).

For each asset, ratings were developed for:

- **Condition** (1-5) - assessed based on indicators for rocky, vegetated, or sedimentary shores;
- **Consequence** (1-5) - related to financial value, repair timeframe, recreation impacts, setback and environmental factors.
- **Likelihood** (1-3) - based on apparent imminence of foreshore disturbing processes.

Datasets for each segment were updated:

- Condition comment;
- Maintenance comment;
- Identification of hazards;
- Consequence comment;
- Condition score: 1 (good) to 5 (bad);
- Consequence score: 1 (good) to 5 (bad); and
- Overall Condition Index (OCI).
- Georeferenced photographs of the foreshore were taken and packaged for use on GIS platforms to communicate specific foreshore issues.

The Overall Condition Index (OCI) is calculated by multiplying condition and consequence ratings, giving a range from 1 (excellent) to 25 (very poor) (see section B4 in Appendix 2 for more details. The score was used in the past assessments as an indicator for prioritisation of work, with the high OCI score sites having a higher priority for implementation over lower-scoring sites.

It is noted that consequence was not used in MP Rogers (2024) aquatic asset assessment (built foreshore elements including jetties), and likelihood was not used in GHD (2014, 2019a). Likelihood modifies priority, as assets exposed to frequent disturbance generally have a shorter structural life. Hence, this FMP uses likelihood in addition to the OCI to develop a finalised score for asset assessment (OCI-L) (Figure 25).

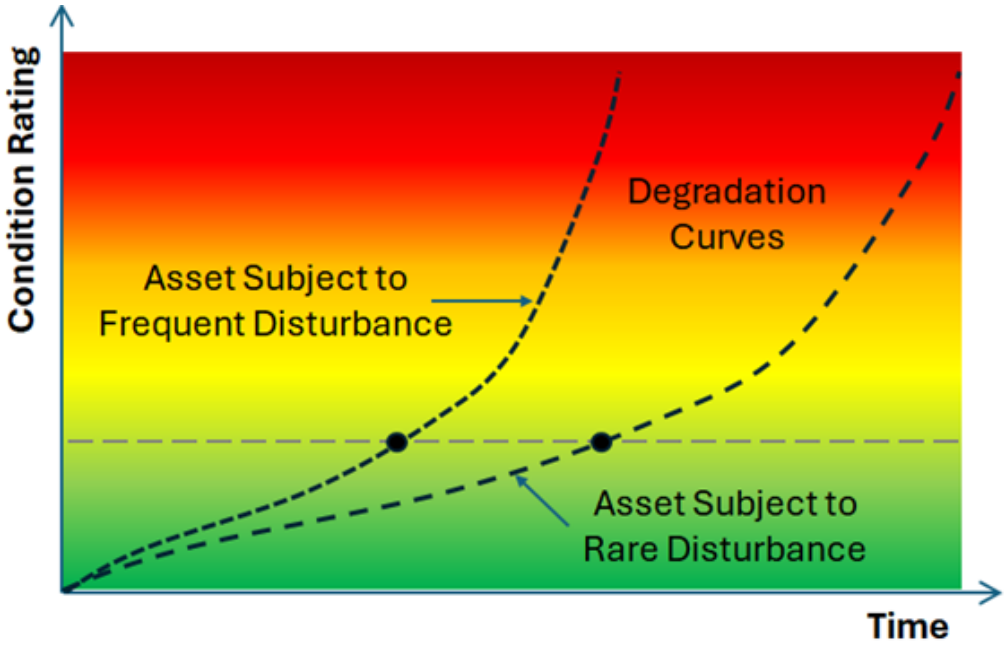


Figure 25. Consideration of likelihood for prioritisation.

Sub-precincts, Segments and Structures

The reference spatial framework provides information at three scales, linking the DBCA framework developed for river management with the City of Melville's asset-based approach. This includes:

- **Precincts*:*** Developed for large-scale river foreshore management with the City of Melville foreshore comprising parts of Precinct 2 (Fremantle Railway Bridge to Point Walter), Precinct 5 (South Melville Water) and Precinct 15 (Canning Bridge to Mt Henry Bridge).
- **Sub-precincts**: Large-scale sections (typ. 500 m - 2 km) with similar river processes and geomorphic connectivity. The sub-precinct scale has been defined for reporting convenience, as the Precinct scale (WRC 2002) is large, clustering all of Applecross and Attadale foreshores into a single Precinct. In contrast, the reach scale (SRT 2008) is too small, with over 40 reaches along the City of Melville foreshore.
- **Segments**: Medium-scale sections (typ. 20 m – 500 m) with equivalent edged treatment (built or natural) or a section with mixed treatment, but an integrated response.
- **Structures**: individual assets identified in the City of Melville asset database.

Reaches and segments were originally identified for the Swan River Trust Foreshore Assessment and Management Strategy (SRT 2008), with a spatial framework maintained and occasionally revised in the DBCA's Swan and Canning Riverpark GIS Database. This framework was used for subsequent

City of Melville foreshore assessments, although revisions have not been made when the foreshore has been modified.

Fourteen river sub-precincts used for this FMP are outlined in Table 2 and Figure 26. These sub-precincts include 114 foreshore segments in the database (54 Natural and 59 Built, Table 3). This represents an increase of 12 segments compared to previous records, reflecting changes resulting from foreshore works undertaken since 2019. A sequential field ID (FID) was used for assessment, but the full segment code and name have been used for database collation to align it with previous assessments. Segments have FID from 1 (East Fremantle Yacht Club) to 114 (Bateman Park), with cross-referencing between FIDs and DBCA Foreshore Segment numbering outlined in Appendix 3.

Table 2. City of Melville foreshore sub-precincts.

SUBURB	COM SUB-PRECINCT SCALE SEGMENTATION
1: Bicton	**COM 1. Quaada Gabee -** Bicton Baths and Blackwall Reach Parade **COM 2. Jenalup -** Blackwall Reach cliffs, little beaches, including Kent Street **COM 3. Dyoondalup -** Point Walter Foreshore Reserve through to Attadale Dog Beach
2: Attadale	**COM 4. Marradungup -** Attadale Reserve from Page Street to Alfred Cove
3: Applecross	**COM 5. Margamangup -** Tompkins Park **COM 6. Margamangup Melville Beach Road** **COM 7. Moondaap - Majestic Cove and Point Dundas** **COM 8. Kooyagoordup - Jeff Joseph and the Strand** **COM 9. Goolugatup** foreshore **COM 10. Gabbi Kowangulup -** Coffee Point and Canning Beach Road
4: Mount Pleasant	**COM 11. Wagoorjup -** The Esplanade North
	COM 12. Wagoorjup – Deep Water Point
	COM 13. Wagoorjup - The Esplanade South
5: Bateman	**COM 14. Gabbiljee-** Thomas Middleton through to Bateman Park

Table 3. Foreshore Classification per sub-precinct segments.

Subprecinct ID and Segment numbers	City of Melville Sub-Precinct ID														
	COM 1 (1-14)	COM 2 (15-19)	COM 3 (20-28)	COM 4 (29-34)	COM 5 (35-36)	COM 6 (36-43)	COM 7 (44-47)	COM 8 (45-53)	COM 9 (53-58)	COM 10 (60-69)	COM 11 (70-89)	COM 12 (90-92)	COM 13 (92-110)	COM 14 (111-114)	
Foreshore Classification															**Total**
NATURAL	5	3	2	6	2	3	1	1	5	4	9	2	7	4	**54**
Rock Shore - Cliff		1							1						2
Rock Shore - Rocky Emergent		1	1						1						3
Sedimentary - Beach	2		1	2		2	1	1	2	1	1	2		1	16
Sedimentary - Perched Beach	1	1													2
Sedimentary - Scarp	2														2
Vegetated - Sedges				4	2	1				3	6		4		20
Vegetated - Tree Lined											2		3	3	8
BUILT	10	1	7			5	1	4	2	7	10	1	11		**59**
Bioengineering	1	1				1		2	1						6
Gabion						1					2				3
Groyne / Beach			2					1			1	1			5
Revetment	4		5			2	1	1	2	5	6		8		34
Wall	5					1				2	1		3		12

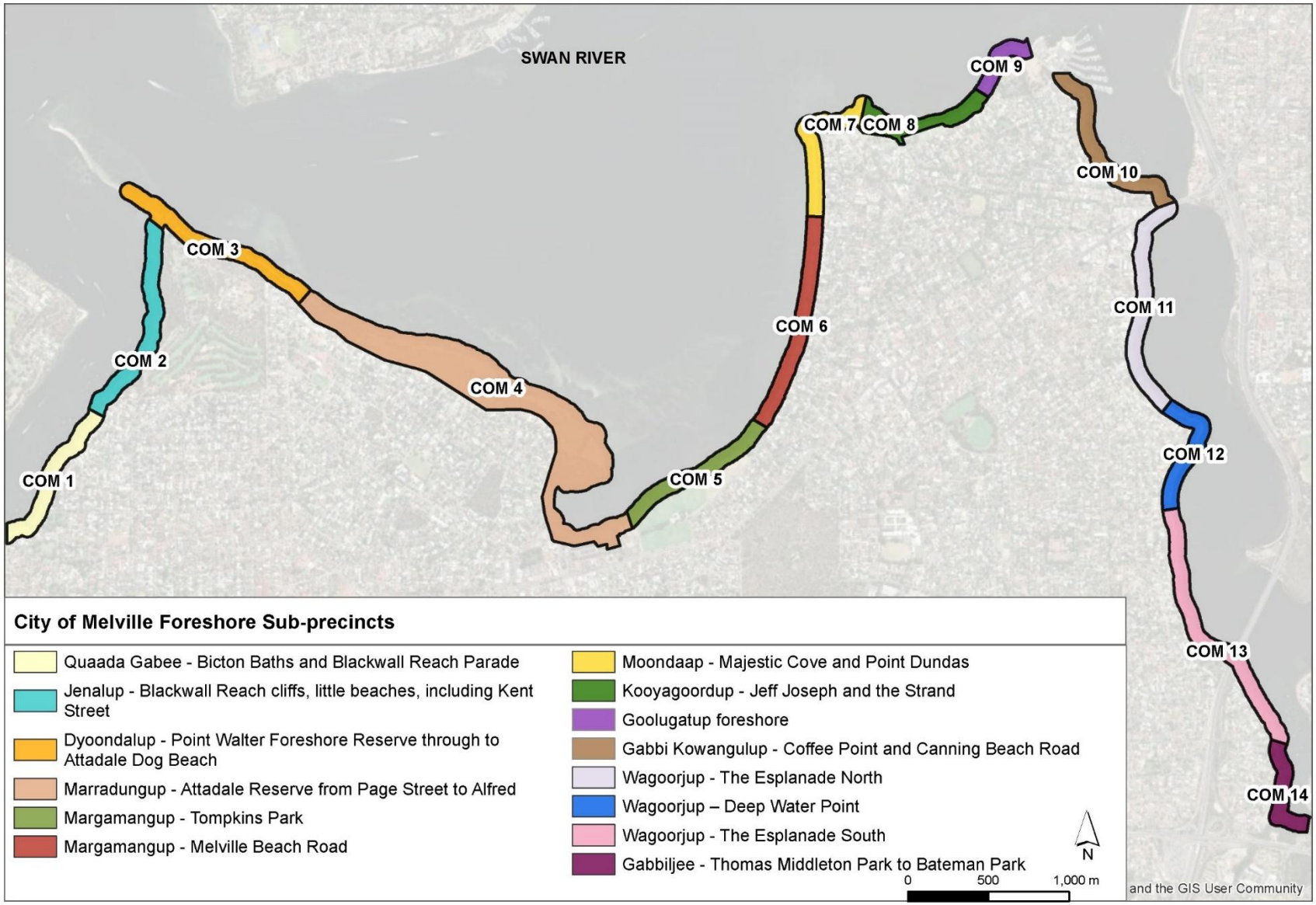


Figure 26. Spatial location of foreshore sub precincts.

7.2.3 Aquatic Infrastructure Condition Assessment

The assessment of the foreshore aquatic assets condition was conducted by M P Rogers & Associates and Shorewater Marine Pty. Ltd. In October 2024 (MP Rogers & Associates 2024). The survey encompassed 26 assets, including jetties, boardwalks, viewing platforms, revetments, walls, steps, and miscellaneous marine structures along the Swan and Canning Rivers. The assessment included:

- Above-water inspections of structures by engineers;
- Underwater inspections and pile testing (core drilling, resistance tests) by commercial divers;
- Asset condition ratings (1 = Very Good, 5 = Very Poor), based on structural integrity, safety, and serviceability.
- Defect risk levels used to prioritise maintenance—higher scores indicate urgent safety or structural risks.
- Remaining useful life and replacement costs were estimated for each asset to inform long-term maintenance planning.

Supporting outputs included georeferenced photos, a GIS inventory, and a maintenance map highlighting required works. Further information is included in the MP Rogers & Associates (2024) report. Specific maintenance items relating to foreshore structures like revetments, walls and jetties have been extracted and included as part of sub precinct management actions in Section 13.0.

7.3 PRIORITISATION OF WORKS

Given the extensive size of the foreshore area and limited resources for its management, a prioritisation process was undertaken to guide management efforts over the FMP term (five years). In addition to prioritisation of works utilising the *Foreshore Asset Assessment* described in Section 7.2; additional rankings were completed for the highest scoring (OCI-L) sites. This was completed using the same method as in the 2019 Foreshore Strategy Review (GHD, 2019a), which is outlined below.

This method is generic in nature and assesses assets against known levels of significance (such as statutory listings), rather than through a quantitative approach that would provide greater differentiation. While this framework is included in this FMP, it is expected that the finalisation of foreshore asset classifications and area mapping within the City of Melville Asset Management Database (and the DBCA Database) will enable improved assessment and prioritisation of works in the future (for example, through the use of scoring and weighting criteria, particularly in relation to ecological value and overall threats).

7.3.1 Broad-scale Ranking of Assets

The first stage of the prioritisation process involves developing a broad-scale ranking of assets (in this case foreshore segments) to provide an indication of their relative significance.

Assets of high significance at the international, national, or state level are identified based on relevant legislation or policy frameworks. These assets are generally well-documented, relatively stable over

time, and can be determined through a desktop assessment. The classifications and rankings for these assets are designed to align with the City's Natural Areas Asset Management Plan 2019 (CoM, 2019).

Other assets are ranked based on infrastructure value, public safety considerations, and recreational amenity. This ranking is based on the specialist expertise of coastal engineers, ecologists, and City staff, and has been developed to align with the DBCA Best Management Practices for Foreshore Stabilisation (SRT, 2009). In this report, this is as per OCI-L scores described in Section 7.2.

The broad-scale ranking of assets, presented in Table 4, provides a framework for undertaking rapid but robust assessments of site-specific assets.

Table 4. Definitions of ranking for assets (from GHD, 2019a).

Asset Ranking	Aspect	Level of significance	Description
Very High	Ecological	International (statutory)	Migratory species are protected under international conventions and the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act)
		National (statutory)	Communities and species protected under Federal legislation (EPBC Act)
		State (statutory)	Species and Communities protected under State legislation (*Biodiversity Conservation Act 2016*)
		State (non- statutory)	Communities and species listed by DBCA (Priority Ecological Communities and Priority listed species)
			Sites listed as Bush Forever by the Western Australian Planning Commission
			Vegetation complexes in the Perth Metropolitan Region with <10% remaining
			Conservation category and Resource enhancement wetlands
	Heritage	National (statutory)	World heritage properties, national heritage places protected under the Federal legislation (EPBC Act)
		National (non-statutory)	Heritage sites listed on the Register of National Estate
		State (statutory)	Registered Aboriginal Heritage sites under the *Aboriginal Heritage Act 1972*
			Registered sites under the *Heritage of Western Australia Act 1990*
	Assets	Infrastructure Value	Assets with a value greater than $100,000
		Public Safety	Assets that involve a very high element of public safety, such as those that can cause major injury and unmanaged hazards
		Recreational Amenity	Foreshore area with large areas of established recreational facilities
High	Ecological	State (non- statutory)	Multiple-use Category Wetland
		Local	Listed by Bush Forever (Government of Western Australia, 2000) or Alan Tingay & Associates (1998) as a regional linkage

Asset Ranking	Aspect	Level of significance	Description
			Listed as a significant species of the Perth Metropolitan Region in the Government of Western Australia (2000) (those not listed under legislation or as a priority by DBCA)
	Heritage	Local	City of Melville listed heritage sites
	Assets	Infrastructure Value	Assets with a value between $10,000 and $100,000
		Public Safety	Assets that involve a high element of public safety, such as those that can cause significant injury with hazard management or minor injury without hazard management
		Recreational Amenity	Foreshore area with some areas of established recreational facilities
Medium	Ecological	Local	The area is a natural area generally in good or better condition
			>4 ha of bushland
			Occurring in a few reserves in the City of Melville
			Sites with active community involvement in management
	Assets	Infrastructure Value	Assets with a value of less than $10,000
		Public Safety	Assets that involve a medium element of public safety, such as those that can cause injury, require hazard management to be bypassed
		Recreational Amenity	Foreshore area with limited recreational facilities
Low	Ecological	Local	Individual trees
	Assets	Value	Assets with a value of less than $1,000
		Public Safety	No hazard management required
		Recreational Amenity	Foreshore area with no recreational facilities and no access

7.3.2 Ranking of Threats

Where possible, threats are identified in accordance with relevant legislation and policy frameworks. These are typically high-level threats that remain relatively consistent over time.

Other threats are prioritised based on their potential to impact public safety, infrastructure, and recreational amenity. This assessment draws on the expertise of coastal engineers, ecologists, and staff from the City of Melville.

Threats that cannot be effectively managed at the local level are excluded from consideration. For example, highly contagious pathogens, which are managed through Federal and State quarantine procedures, are not included.

The broad-scale ranking of threats, shown in Table 5, provides a framework to support timely and robust assessment of threats at specific foreshore sites.

Table 5. Ranking of threats (GHD, 2019a).

Threat Ranking	Aspect	Level of significance	Threats
Very High	Ecological	National (statutory)	Any key Threatening Process listed under the EPBC Act High level of impact from introduced pest species (i. e. grazing from rabbits)
			High level of predation by Feral Cats or European Red Fox
		National (non-statutory) / State (statutory and non-statutory)	Infestation of Weeds of National Significance or a Declared Pest listed under the *Biosecurity and Agriculture Management Act 2007* likely to affect ecological asset >1 year. Areas with significant weed invasions that are impacting the condition of the native vegetation
		Local	High amount of trampling of vegetation, potential to affect ecological asset >1 year
			Potential for dieback and other diseases to invade non-infested vegetation
	Assets (Condition assessment rating: Failing)	Infrastructure Value	Likely impact within one year
		Public Safety	Potential for accident within one year
		Recreational Amenity	Permanent interruption of foreshore area with high use by public for recreational activities
High	Ecological	Local	Medium amount of trampling of vegetation, potential to affect ecological asset 1-5 years
			Unofficial tracks/access to areas leading to erosion of banks and cliffs
			Areas with significant weed invasions which are not currently affecting the condition of the native vegetation but have the potential to spread and impact the condition of the vegetation.
	Assets (Condition assessment rating : Poor)	Value	Likely impact in 1 to 5 years
		Public Safety	Potential for safety hazard between 1 to 5 years
		Recreational Amenity	Reduced area or temporary interruption of high use foreshore area
Medium	Ecological and Social	Local	Rubbish dumping, but not likely to significantly impact ecological asset >1 year
	Ecological	Local	Low amount of trampling of vegetation, potential to affect ecological asset 1-5 years
			Areas with low levels, or isolated infestations of weeds
	Assets (Condition assessment rating : Fair)	Infrastructure Value	Likely impact after 5 years
		Public Safety	Potential for safety hazard after 5 years
		Recreational Amenity	Foreshore activities can be relocated
Low	Ecological	Local	Areas with weeds that are not affecting native vegetation and that are currently well controlled (i. e. grassed areas that are regularly mowed and do not have the potential to invade native vegetation) Areas with weeds that have low potential to invade native vegetation
		Infrastructure Value	Only during an extreme event

Threat Ranking	Aspect	Level of significance	Threats
	Assets (Condition assessment rating : Good)	Public Safety	Only during an extreme event
		Recreational Amenity	No disruption of foreshore activities

7.3.3 Prioritisation framework

Site-specific assets were identified and assessed as follows:

- Desktop review of existing strategies, management plans, and relevant literature;
- Detailed inventory conducted by engineering and ecological specialists.
- Specialist knowledge from City of Melville and DBCA staff.

A list of these site-specific assets is provided in Appendix 4 alongside priority rankings.

Each asset was scored based on the OCI – L and broad-scale asset and the threat ranking. While the selected high OCI-L rankings (20 – 22) are given Priority 1 rank, and 18 – 19 Priority 2 rank, the broadscale rankings for assets and threats were combined to assign an overall priority using the framework set out in Table 6.

Table 6. Prioritisation Assessment Table (GHD, 2019a).

Ranking of Asset	Ranking of Threat			
	Very High	High	Medium	Low
Very High	Priority 1	Priority 1	Priority 2	Priority 2
High	Priority 1	Priority 1	Priority 2	Priority 2
Medium	Priority 2	Priority 2	Priority 2	Priority 3
Low	Priority 2	Priority 2	Priority 3	Priority 3

7.3.4 Top five projects prioritisation process

A workshop was held with the City of Melville Foreshore Officer, City of Melville Natural Areas Coordinator, DBCA Riverbank Manager, Coastal Engineer, and Ecologist to present the preliminary findings of the site assessment. The priorities identified through the process described above were reviewed and discussed. The objective was to prioritise sites further and determine the top five sites requiring restoration works, for which conceptual project specifications would be developed to assist the City with grant applications.

The conceptual drawings for the top five sites are provided in Appendix 9. An estimated costing for each site was supplied to the City in a separate Excel spreadsheet, based on current labour and material rates, to support future planning, budgeting, and contractor engagement for remediation works.

8.0 RESULTS

8.1 FLORA

8.1.1 Native Flora Diversity

A reconnaissance flora assessment of the foreshore area was undertaken in November 2024 with 347 flora species recorded, of which 39% (135 taxa) were indigenous native flora and 8 were non-indigenous planted native tree species (species list is provided in Appendix 6). Of the 135 taxa recorded, seven species are 'At-Risk' species (Table 7). All of the identified species at risk still persist within the foreshore area.

Table 7. At-risk' (high priority) flora species.

At-risk Species	2004	2013	2019	2024
Acacia xanthina	No data	Present	Present	Present
Alyogyne huegelii	No data	Present	Present	Present
Alyxia buxifolia	No data	Present	Present	Present
Dodonaea hackettiana	No data	Present	Present	Present
Amyema linophylla	No data	No data	Present	Present
Apium prostratum	No data	No data	Present	Present
Cyperus gymnocaulos	No data	No data	Present	Present

8.1.2 Introduced Flora / Weeds

Of the 347 flora species recorded in the foreshore area, a total of 140 weed species (40%) from 49 families were identified in the foreshore area by NAMS, (2024). The weeds included 11 very high impact and 11 high impact weed species as per City's target weed species list (Appendix 6). The most numerous weeds belonged to the Poaceae (grass) and Asteraceae (daisy) families. **Cynodon dactylon* (Couch) was present along most of the foreshore at varying densities, with the highest densities observed within the vegetation along Attadale Reserve and Troy Park Reserve and at the south-east end of the site boundary along the Canning River.

Six declared pests (DP) and/or Weed of National Significance (WoNS) were identified within the survey site (NAMS, 2024):

- *Bridal Creeper* (*Asparagus asparagoides) (DP, WoNS);
- *Common Lantana* (*Lantana camara) (DP, WoNS);
- *One-leaf Cape Tulip* (*Moraea flaccida) (DP);
- **Rubus ulmifolius* (DP, WoNS);
- Athel Tree (**Tamarix aphylla*) (DP, WoNS);
- Arum Lily (**Zantedeschia aethiopica*) (DP).

8.1.3 Tree Health

A total of 4,903 trees (> 2 m tall and > 10 cm DBH) were recorded during the tree health assessment, with 84% of trees recorded as having good to very good condition (Table 8). This tree number is recorded for the foreshore and the buffer and includes street trees. The remaining 16% were of poor health or dead. Up to 1,101 trees were determined as potentially infected with Polyphagous Shot-hole Borer (PSHB, *Euwallacea fornicatus*). At the time of preparing this FMP, confirmation of infection remains subject to verification by the Department of Primary Industries and Regional Development (DPIRD).

Table 8 Trees and their condition rating (NAMS, 2024).

Score	Condition	No. of trees
0	Dead	431
1-5	Poor	62
6-10	Moderate	292
11-15	Good	1,908
16-20	Very good	2,210

8.2 FAUNA

8.2.1 Fauna Diversity

A total of 51 native fauna species were recorded for the foreshore area, comprising 43 bird species, three mammal species, and three reptile species (NAMS, 2024). The species list for the fauna recorded is provided in Appendix 7.

One conservation significant fauna species was recorded, the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), which is listed as Vulnerable under the EPBC Act and the BC Act.

Six introduced fauna species were identified within the survey site, including two declared pests. The declared pests recorded included:

- Rainbow Lorikeet (**Trichoglossus moluccanus*) – Declared Pest – s22(2) (C1 Exempt, C3 Exempt)
- Rabbit (**Oryctolagus cuniculus*) (DP) – Declared Pest – s22(2) (C3 Prohibited).

8.2.2 Bats

In 2024, two bat species were recorded – Gould's Wattled Bat (*Chalinolobus gouldii*) and White-striped Free-tailed Bat (*Tadarida australis*) by Natural Area (NAMS, 2024). Southern Forest Bat (*Vespadelus regulus*) was recorded in 2013 by Bamford Consulting (NAMS, 2020), and Chocolate Wattled Bat (*Chalinolobus morio*) has also been recorded (CoM, 2019).

All species utilise hollows of large trees (WAM, 2025), and White-striped Freetail Bat and the Southern Forest Bat will also occupy loose bark and stumps. Chocolate Wattled Bats also use disused birds' nests. Tuart trees have a particularly important role for hollow-dependent bat species (Dell et al. 2002).

Large trees are more likely to provide hollows, with a total of 359 large habitat trees (>60 cm DBH) recorded at the Estuarine Reserve (NAMS, 2020).

8.2.3 Birds

A total of 46 bird species were observed during the survey, including three introduced species (NAMS, 2024). However, actual bird diversity is likely significantly higher, due to the opportunistic nature of the study and the seasonal variation in bird movements. Friends of Melville Bird Sanctuary (FoMBS) have documented 134 species in the western portion of the sanctuary and 79 species in the eastern region (FoMBS, 2025).

The salt marsh and wooded areas within the Melville Bird Sanctuary provide excellent habitat for birdlife. The mudflats serve as key foraging grounds for migratory species such as the Bar-tailed Godwit. Other migratory visitors include the Common Greenshank, Grey Plover, Red-necked Stint, Curlew Sandpiper, Great Knot, Red Knot, Whimbrel, and Terek Sandpiper (FoMBS, 2025).

One species listed under the EPBC Act, the Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), was recorded. Two Marri-dominated vegetation communities (CcW and CcMpBaW) are likely to provide suitable foraging habitat, as approximately 90% of the Red-tailed Black Cockatoo's diet consists of Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*). Riparian woodlands, such as *Casuarina* stands, can also provide roosting and foraging habitat for various black cockatoo species (GHD, 2019a).

A review of DBCA habitat mapping for the endangered Carnaby's Cockatoo (*Calyptorhynchus latirostris*), roosting and foraging habitat includes wooded areas of Blackwall Reach, Attadale foreshore and Bateman Park.

A total of 359 large trees (defined as >60 cm diameter at breast height [DBH]) have previously been recorded, with the majority (91%) located at Blackwall Reach and Point Walter. Large native tree species observed include *Agonis flexuosa, Allocasuarina fraseriana, Casuarina obesa, Corymbia calophylla, Eucalyptus gomphocephala, Eucalyptus marginata,* and *Melaleuca rhaphiophylla*. Several introduced or planted species also contained hollows, such as *Eucalyptus* spp., *Ficus macrophylla, Melia azedarach,* and *Pinus pinaster*.

Other habitat types present that also offer some value to fauna include:

- **Sandy beaches** that provide resources to opportunistic species, such as Silver Gulls and Australian Ravens (GHD, 2019a)
- **Cliffs,** such as those at Blackwall Reach and Point Heathcote, provide breeding habitat for Nankeen Kestrel. Rocks also provide perching and drying habitat for cormorants (GHD, 2019a)
- **Fringing sedgeland vegetation** is an important habitat for shorebirds, providing habitat for protection against predators and foraging (GHD 2019a).

8.2.4 Reptiles

Three reptiles were recorded in 2024, including Fence Skink (*Cryptoblepharus buchananii*), *Ctenotus fallens* and Bobtail (*Tiliqua rugosa)*. A further seven species have previously been recorded in the estuarine reserves (NAMS, 2020) and at least some of those species would also be found within the foreshore area.

8.2.5 Invertebrates

While invertebrates were not surveyed as part of the current scope of works, a total of 23 species have previously been recorded in the estuarine reserves, with only one introduced species recorded (bee) (NAMS, 2020). Of significance, Polyphagous Short-Hole Borer (PSHB) was recorded within the foreshore by NAMS, (2024). This is an introduced pest beetle, which is having an impact on several tree species within the reserve.

8.3 VEGETATION CONDITION

Vegetation condition throughout the Melville foreshore survey area ranged from completely degraded to excellent, with good to very good representing 62.23% of the vegetation (Table 9).

Table 9. Vegetation condition for the foreshore area (NAMS, 2024).

Area	Excellent	Very Good	Good	Degraded	Completely Degraded	Total
Area (ha)	6.45	11.5	13.36	7.42	1.22	39.95
Area (%)	16.15	28.79	33.44	18.57	3.05	100

Vegetation in excellent condition had low weed cover and high structural diversity and was recorded within the Alfred Cove saltmarsh area.

Areas assessed as being in very good condition exhibited increased weed presence while retaining high structural diversity and were recorded predominantly at Blackwall Reach and Bateman Park reserves. Good condition vegetation was recorded as a dominant condition for the foreshore, occupying just over 33% of the area.

Degraded vegetation demonstrated substantial structural disruption and elevated weed loads and was recorded throughout the foreshore in isolated patches. The completely degraded areas were defined by the absence of native vegetation structure and a very high density of invasive species, but excluded grassed parkland areas, which occupy most of the foreshore outside the immediate riparian edge. The spatial distribution of vegetation condition across the site is presented in Figure 27.

Figure 27. Foreshore Vegetation Condition (after NAMS, 2024).

8.4 2019 TO 2024 DIFFERENCES IN VEGETATION CONDITION AND BIODIVERSITY

Direct comparisons with the 2019 Foreshore Strategy are limited due to changes in the overall foreshore boundary, differences in mapping scale, and variations in qualitative assessment methods. Despite these constraints, the following key changes between 2019 and 2024 have been identified:

- A number of foreshore restoration projects have improved overall stability of the foreshore and increased habitat and biodiversity value of some foreshore areas (mainly associated with the Tompkins Park to Goolugatup and smaller sections of the Bicton foreshore. These projects are listed in Section 8.8.

- The completion of the Attadale – Alfred Cove Masterplan has initiated several projects to improve biodiversity in collaboration with DBCA and the local Friends of Groups, resulting in the formation of the Melville Bird Sanctuary with a dedicated viewing platform at Alfred Cove, removal of damaged pathway at Attadale reserve and initiation of works for pathway replacement with a dedicated boardwalk.

- Vegetation condition has improved for the restored sections of the foreshore at Bicton, Attadale Reserve, Tompkins Park to Point Dundas, and the Bateman Reserve; however, the key weeds of concern are persisting in the same locations with similar coverage as recorded in 2019. Couch is a widespread weed along the foreshore and at times is mixed with native marine couch, which poses issues for management, requiring staff and contractors to

positively identify both species with ease. While a weed, Couch offers some bank stabilisation value and should be kept until such time funds are available for foreshore restoration.

- A much higher number of both weed and native flora was detected in 2024 compared to 2019 (e.g, a total of 163 flora recorded in 2019 and 347 in 2024). While some differences can be attributed to revegetation and maintenance works, the difference noted is mostly related to the larger area of the foreshore being mapped in 2024.

- The number of fauna observed within the foreshore area in 2024 is 51 native fauna species, comprising 43 bird species. This number is likely to be greater if the survey was conducted for a longer period of time and across seasons. However it compares well with the 72 of fauna observed for estuarine reserves in 2019 (NAMS, 2020) with same species observed indicating that as a minimum fauna habitat has been maintained. Habitat for fauna has also been improved in a number of locations via revegetation efforts by the City and the Community.

- A large number of trees have been found with signs of PSHB disease – this is yet to be confirmed by an expert.

A combination of natural forces and historical modifications shapes the foreshore within the City of Melville. Key riverine processes influencing the foreshore include channel morphology, flow, water levels, wave energy, and vegetation dynamics. These processes vary significantly across the different reaches of the Swan-Canning Estuary that border the City, resulting in site-specific management needs.

8.5 FORESHORE ASSET CONDITION

8.5.1 Historic Foreshore Change

Overall foreshore change from 1953 to 2023 has included substantive foreshore advancement, through reclamation works, and mild erosion, typically <5 m (i.e. <0.1 metres per year (m/y), for other areas (Figure 28). In areas of reclamation, erosion subsequent to placement has been significantly greater (>0.3 m/y) than the retreat of other areas. Losses from these areas (Figure 28) are generally consistent with directions indicated by onshore winds and have generated significant historical management focus.

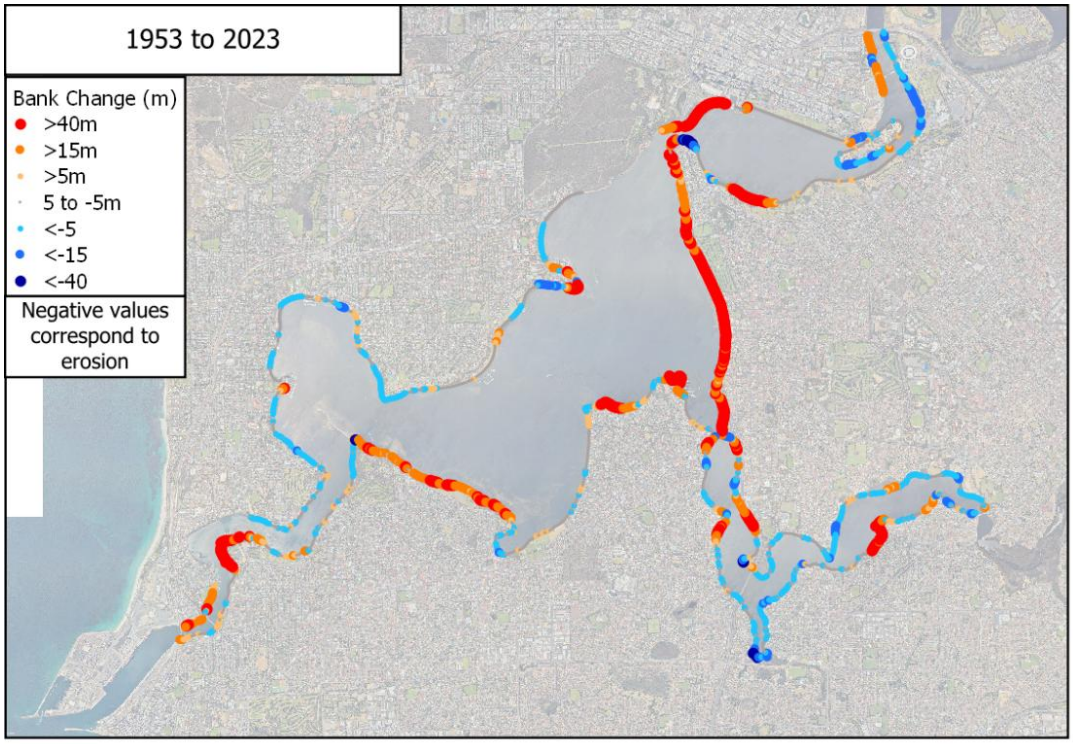


Figure 28. Locations of foreshore reclamation & long-term change

Sediment transport along Attadale foreshore following reclamation has developed as three focal areas of erosion pressure(Figure 29). Immediately following placement, mobility was high, with a reducing rate of change following establishment of foreshore vegetation, including riparian sedges and nearshore Sheaoak (Figure 29).

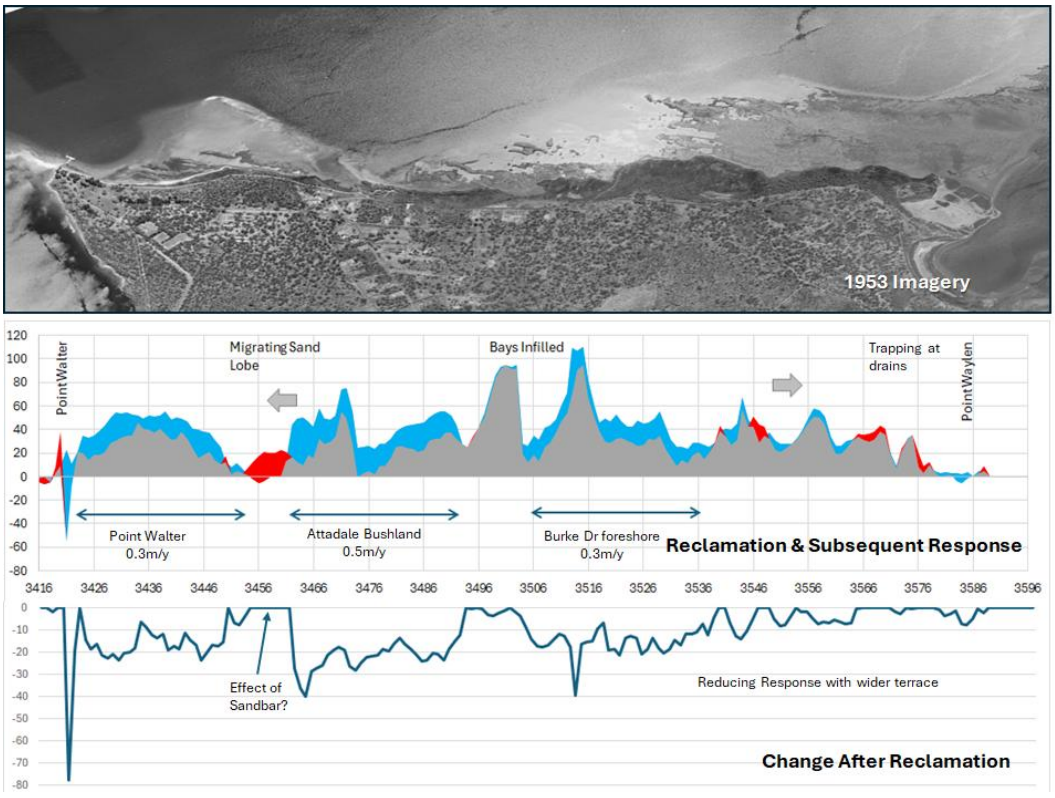


Figure 29. Attadale foreshore response after reclamation

Relative stresses and the role of riparian vegetation vary between the following focal areas:

- **Point Walter** foreshore has been extensively managed through artificial structures, with rockwork present along almost 600 m of foreshore. These structures retain sand locally, subject to seasonal variation, but material loss continues across this section, including deepening in front of the walling.

- **Attadale Bushland foreshore** has partly resisted erosion pressure through riparian vegetation. However, anchoring is now limited to remnant Sheaoak, which are progressively being lost through undermining. The importance of these trees has been highlighted by severe local scarping where the spacing of mature trees is greater than 20m.

- **Burke Drive foreshore** has also resisted erosion pressure through riparian vegetation. However, anchoring is often provided by sedges, with few Melaleucas controlling shore position. It is considered likely that the wider sub-tidal terrace and flatter intertidal zone have contributed to the lower undermining stress.

- Behaviour near **Deepwater Point** has seen erosion pressure on the originally reclaimed foreshore extend to the foreshore ~500 m to the south. The arcuate beach, which formed following reclamation, has progressively rotated, with additional net loss from the southern end of the beach, near Queens Road (Figure 30). Trapping by the ramp has had a local effect only, with renourishment and headlands constructed in 2018 partly offsetting the erosion previously experienced north of the ramp.

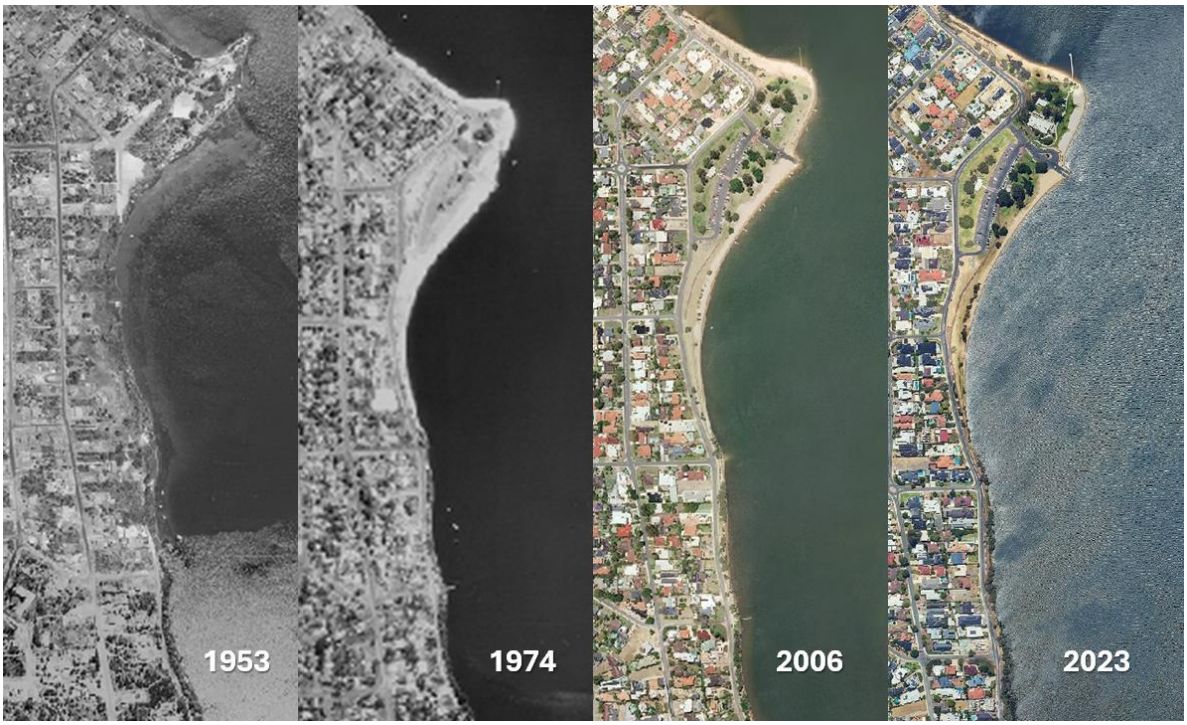


Figure 30. Deepwater Point Attadale foreshore response after reclamation.

8.5.2 Land Development Pressures

Relative exposure and perceived foreshore dynamics have been influential in land development pressure along the Melville foreshore. Wider setbacks were established for the Melville Water foreshore, which is subject to greater waves. Along the Canning Water foreshore, roads and paths were built much closer to the original shore (Figure 31), creating a limited foreshore reserve within which to support riparian zone evolution, or tolerate erosion pressure.

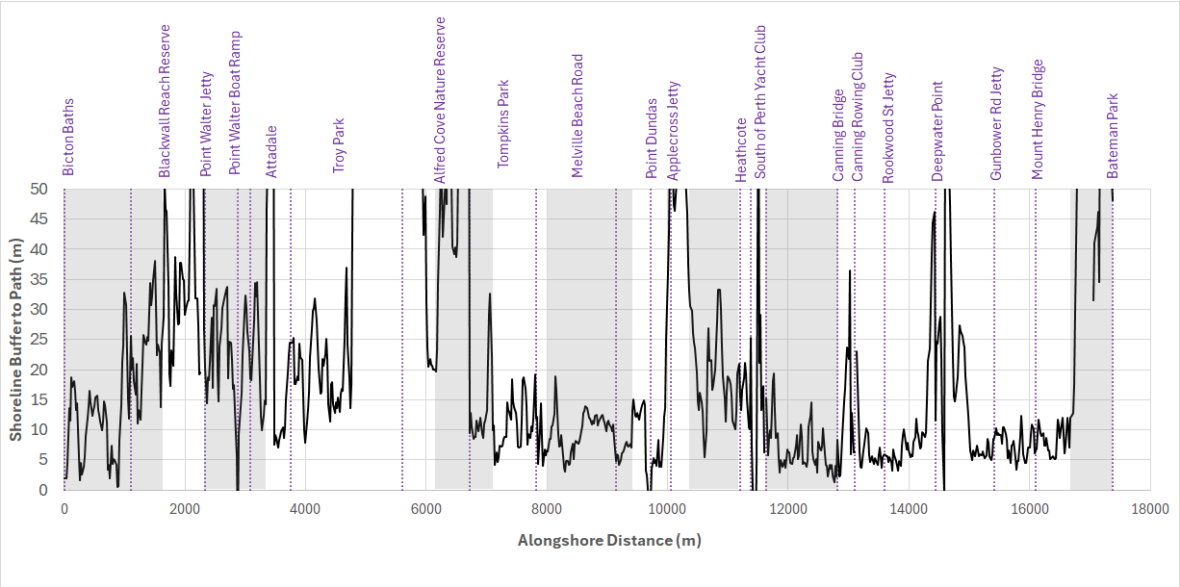


Figure 31. Available Buffer Distance to Foreshore Path

8.5.3 Foreshore Condition Assessment Results

Mapping of foreshore condition Overall Condition Index (combining condition and consequence), and OCI with likelihood (Figure 32) are shown for both built assets and natural foreshore segments in this Section, with OCI per segment also listed in Appendix 3. Representative examples of areas exhibiting the most severe foreshore degradation are illustrated through selected site photographs (Figure 34, Figure 36 and Figure 37) and segment maps and tables below illustrating key sections of the natural and built foreshore requiring restoration, and repair. Comprehensive assessment data, including detailed condition ratings, comments, and supporting spatial information, are contained within the accompanying Excel dataset, GIS shapefile, and geotagged photolog submitted as part of this deliverable.

Approximately 75% of the foreshore length was classified as natural, with 25% built, noting the original classification requires updating. Most built assets have been assessed as Condition ≥3, indicating a need for maintenance or upgrades. Similarly, many natural assets are Condition ≥3, including:

- Narrow riparian zones along the Canning River foreshore, which typically give higher ratings.
- Erosion in beach areas, with net loss and small scarps.

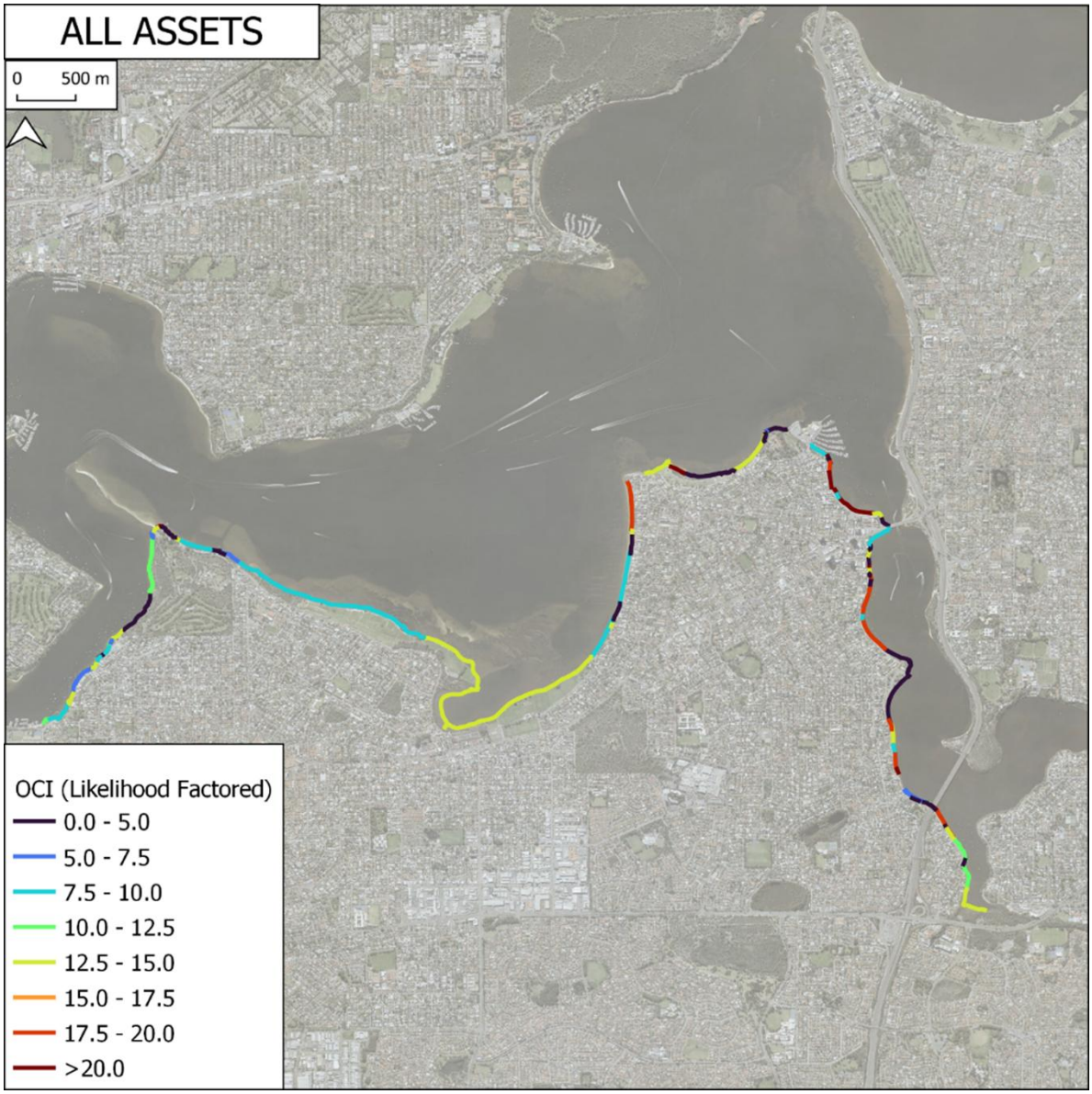


Figure 32. Asset overall condition index, including likelihood.

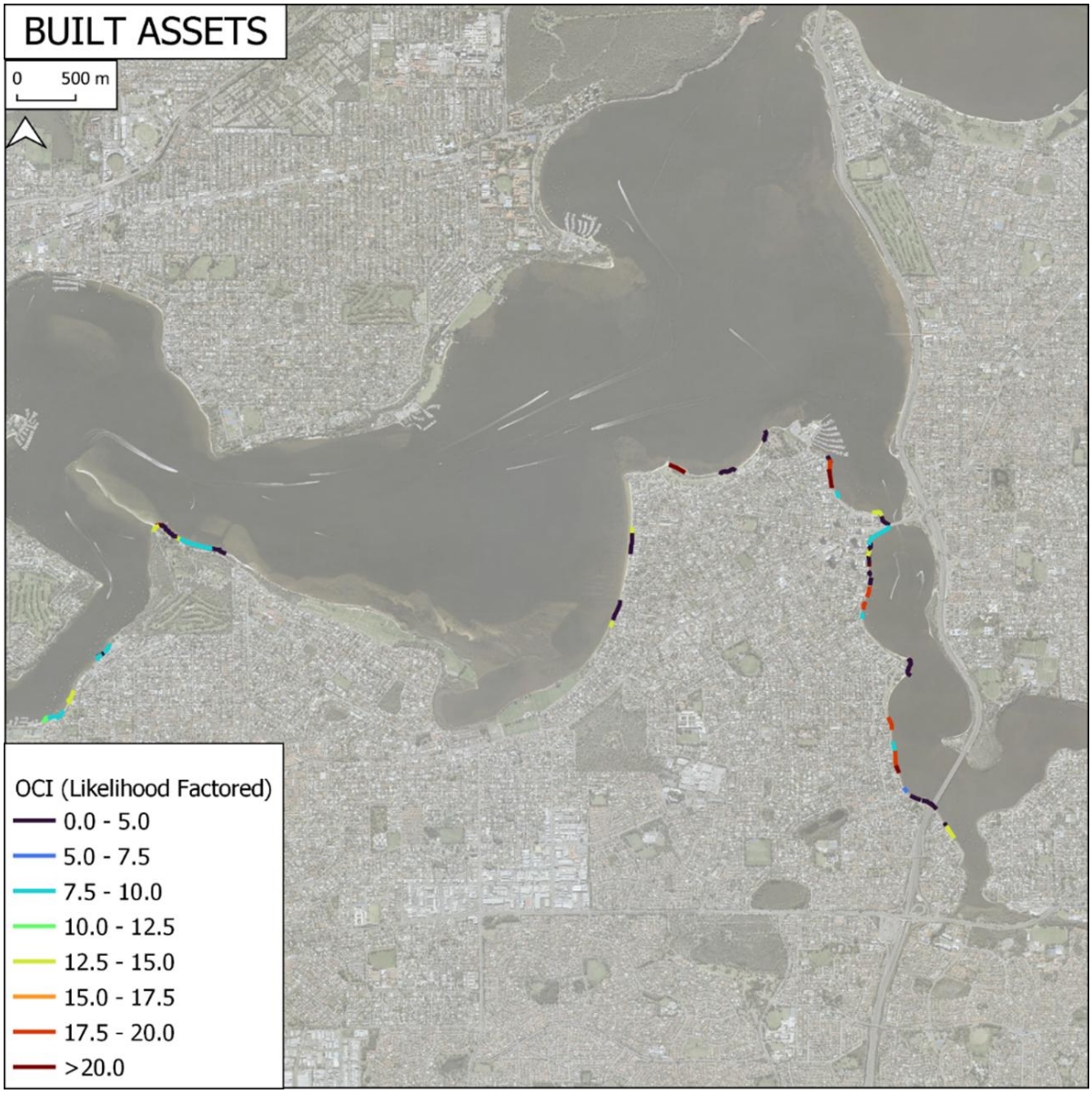


Figure 33. Built asset overall condition index, including likelihood.

Table 10. Highest priority built asset segments.

COM	Segment Name (DBCA)	OCI (2019)	OCI (2025)	OCI-L
13	CLPle03 Henry Bridge.B06	13	19	22
13	CLPle03 Henry Bridge.B09	18	19	22
11	CLPle06 Apex Reserve-John XXIII Rowing Club.B04	3 (new)	19	22
3	SLBic01 Point Walter East-Boat ramp and jetty.B06	13	19	22
10	SLApl01 Beach Rd to Coffee Point Reserve.B04	18	19	22
13	CLPle03 Henry Bridge.B07	13	19	19
11	CLPle05 The Esplanade-Rookwood Street Jetty.B??	not assessed	13	19
11	CLPle06 Apex Reserve-John XXIII Rowing Club.B01	13	13	19
10	SLApl01 Beach Rd to Coffee Point Reserve.B05	13	13	19

Figure 34. Selected high OCI 'Built' segment location images.

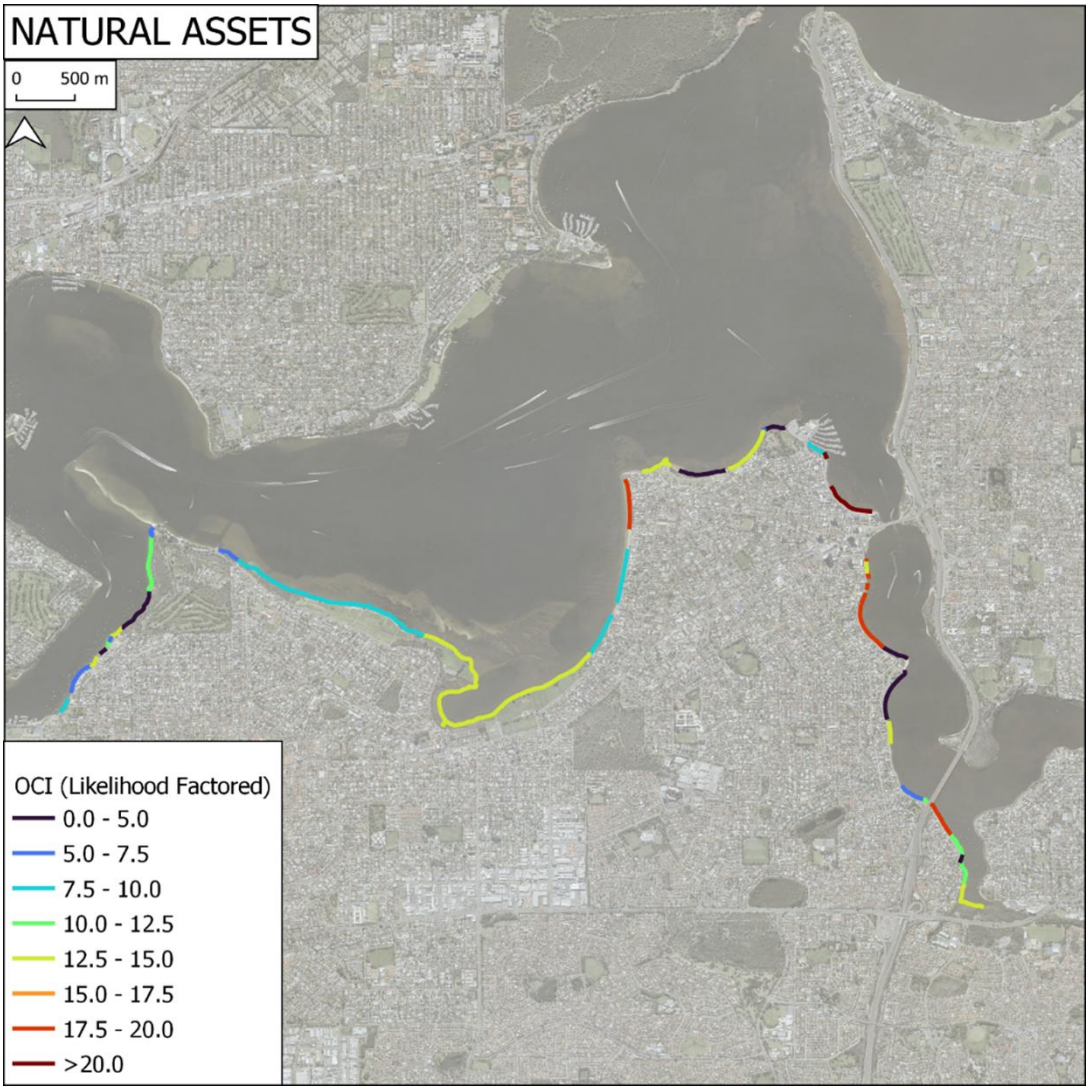


Figure 35. Natural asset overall condition index, including likelihood.

Table 11. Highest priority natural asset segments.

COM	Segment Name (DBCA)	OCI (2019)	OCI (2025)	OCI-L
10	SLApl01 Beach Rd to Coffee Pt Reserve.N01	19	19	22
10	SLApl01 Beach Rd to Coffee Pt Reserve.N02	19	19	22
10	SLApl02 Beach Rd to Coffee Pt Reserve.N04	19	19	22
8	SLApl06 Jeff Joseph Reserve.B02	19	19	21
11	CLPle06 Apex Reserve-John XXIII Rowing Club.N04	19	19	19
13	CLPle01 The Esplanade to Beamish Ave.N02	not assessed	19	18
13	CLPle02 The Esplanade to Regents Wy.N01	not assessed	13	18
11	CLPle05 The Esplanade-Rookwood Street Jetty.N02	21	13	19
11	CLPle05 The Esplanade-Rookwood Street Jetty.N03	20	13	19
11	CLPle06 Apex Reserve to John XXIII Rowing Club.N01	20	13	19
11	CLPle06 Apex Reserve to John XXIII Rowing Club.N02	20	13	19
7	SLApl07 Point Dundas Boardwalk -Jeff Joseph Res.N02	19	13	19

Figure 36. Selected high OCI 'Natural' segment location images (a).

Figure 37. Selected high OCI 'Natural' segment location images (b).

8.5.4 Foreshore Condition Comparison with Previous Assessments

Three previous evaluations were considered as a cross-check for the present assessment:

- GHD (2019b) provided condition and consequence ratings for built and natural shoreline segments, following the DBCA reference system. This allows direct comparison against the present assessment, potentially highlighting areas of degradation.
- GHD (2019a) gave a condition rating to foreshore assets considered at risk. This included infrastructure, amenity, natural assets, or foreshore treatments. The report listed the highest priority assets.
- MP Rogers (2024) included condition assessment ratings for foreshore protection structures and provided estimated costs for restoration. This did not evaluate the consequence or the likelihood of foreshore disturbance.

A comparison of condition and consequence ratings from GHD (2019b) suggests a slight degradation of foreshore condition, with 35% of assets rated worse than in 2019 and 13% given an improved condition rating. Consequence ratings remained 68% unchanged, with slight variations evidently due to differences in rating schedules. During inspection, it was noted that many areas of Attadale and Canning River foreshore were in better condition than had been observed across multiple site visits over 2020-2024, potentially due to seasonal change, with March having the lowest wave and water level conditions, helping to provide a beach buffer at many sites.

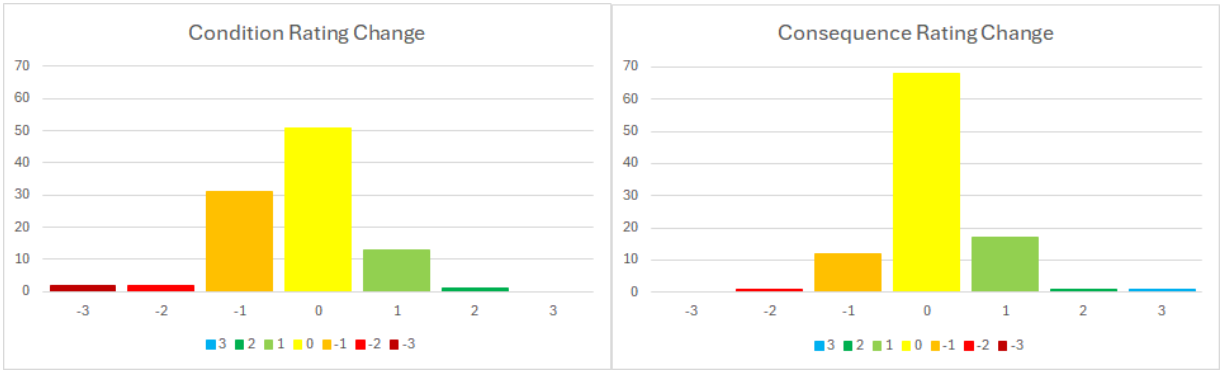


Figure 38. Foreshore asset condition rating differences 2019 to 2025.

Condition variation from MP Rogers (2024) for built assets was related to MP Rogers use of degradation criteria for condition rating, which gave 96% of built assets a rating of 2 or 3, apparently reserving rating 1 for newly built assets, and rating 4 for largely failed assets. For the present assessment, condition rating was based on functional condition, which gave a wider range of ratings, but generally picked out the same assets in poor condition.

GHD (2019a) does not provide a systematic list of assets evaluated and their ratings. Direct comparison is only available for areas assigned a high priority, which have subsequently been the areas of focused management and enhancement by the City of Melville.

Undertaken comparison with previous evaluations since 2009, GHD (2019a) reported erosion pressure at a sub-precinct scale, for parts of the Melville foreshore. This evaluation was replicated to indicate change over time (Table 12).

Table 12. Variation of erosion pressure since 2009.

COM ID	Location	Hazard ID *	Rating				Comments 2025
			2009	2014	2019	2025	
14	Bull Creek	4, 12	H	H		L	Some vegetation loss, but low erosion rating at the time of the survey
11	Canning River	1,2,4,5,8, 10,12	Neg	L		M	Evidence of trampling, overbank flow
10	SoPYC to Canning Bridge	1,2,4	L	M		H	Energetic wave conditions; erosion scarps, overwashing, Vegetation loss
8	Waylen Bay	1,4,	L	M		L	Vegetation loss and relatively energetic wave conditions, but erosion impacts were low during the time of the field visit
6	Melville Beach	1,2	L	L	H	L	Scarps have been addressed & erosion pressure at the time of site assessment in March was low
3	Point Walter	1,2,5	M	L	H	M	Erosion threat to trees; sediment source/sink; energetic wave conditions & increased water levels
1-2	Blackwall Reach	2,4,8,12	L	H	M	M	Erosion and trampling cause pressure on vegetation and pose a threat to trees

* See Appendix 2 Table K for explanation of hazard codes

Sub-precinct rating scale from NAMS (2009):

Neg: *No evidence of erosion damage.*

L: *Minimal erosion damage evident, banks still intact, some loss of fringing vegetation, no undercutting of large trees, erosion mitigation structures functioning.*

M: *Some erosion damage evident, some soil lost from banks, slight undercutting of large trees and loss of some fringing vegetation, erosion mitigation structures still intact.*

H: *Extensive erosion damage is evident, including extensive loss of soil, damage to existing erosion mitigation structures, severe undercutting of large trees, and uprooting of fringing vegetation.*

8.5.5 Distribution of Pressures

The greatest foreshore management pressures are strongly related to the development history of the foreshore, particularly areas where there was extensive previous reclamation or where development was conducted close to shore (e.g. roads).

Severe poor condition of both natural and built assets is prevalent along the Canning River foreshore, north of Mount Henry Bridge, up to the South of Perth Yacht Club. The sheltered condition of this foreshore provided a naturally narrow riparian zone and prompted development close to the shore, including foreshore roads built through the 1960s and subsequent path construction. The proximity of this infrastructure and amenity assets limited the ability of the riparian zone to migrate with changing conditions, and in the period of rapid sea level rise since the 1990s, the narrowing of fringing vegetation and extensive construction of revetments have occurred. This foreshore is strongly responsive to sea level change, with enhanced response where reclamation works were conducted, including Canning Bridge and south of Deepwater Point.

High pressure has occurred along the Point Walter foreshore, largely attributable to significant reclamation works. High public use has prompted significant foreshore stabilisation works, although these typically only provide local retention, and the overall pattern of loss from this foreshore appears to be progressive.

Attadale foreshore was subject to extensive reclamation in the 1960s and has experienced persistent erosion pressure since. However, the shallow foreshore grade and relatively higher wave energy supported development of a wide riparian zone through the 1970s and 1980s when conditions were most stable. Although this is foreshore under widespread pressure, requiring removal of the Attadale Bushland foreshore path, there is some opportunity for riparian zone migration – possibly requiring managed retreat to mitigate the longer-term risk of exposing landfill material (see Section 3.5).

Melville Beach and Waylen Bay, including Point Heathcote, are exposed to the highest wave energy conditions along the Melville foreshore, and have experienced intermittent periods of erosion pressure related to storm-recovery cycles. The capacity of beach systems to absorb these fluctuations without adverse impact has been reduced by the construction of foreshore infrastructure, progressively moving towards the river, and in Waylen Bay, there is additional pressure developed by the progressive loss of reclamation material.

8.5.6 High Priority Areas

Areas of foreshore pressure, or with degraded protection structures, are listed from west to east:

COM 03 Small revetment west of **Point Walter Jetty** - requires maintenance.

COM 06 **Beach south of Point Dundas** - Low elevation, high wave energy, recent erosion/loss and a small buffer to a low path in the southern part.

COM 08 **East of Applecross Jetty** - (Jeff Joseph Reserve) - Failed bioengineering section and foreshore is eroding; vegetation buffer remains, but erosion is a concern.

COM 10 **Coffee Point Reserve to Canning Bridge** – Erosion pressure (scarping/loss of vegetation), low areas with active overwash, and structures in poor condition (some too low). There is generally limited space to path.

COM11 **South of Canning Rowing Club** - Rendered gabion wall heavily undermined at the corner and flanking erosion between structures, where there is a variable buffer to path.

Foreshores north of Deepwater Point – Narrow vegetation buffer with erosion at the path interface.

COM13 **Foreshores north of Queen St** – Ongoing erosion pressure with redistribution of sediment towards Deep Water Point (related to historic reclamation); includes a flanked revetment and an eroding foreshore to the north.

Revetments south of Gunbower Road Jetty – Poor condition (low and flanked), with a narrow or steep buffer to the path.

Natural foreshores extending south of Mount Henry Bridge – Erosion pressure on trees and a narrow buffer to the path.

A subset of foreshore built and natural assets, with the highest OCI-L (i.e. worst combination of condition, consequence & likelihood), are listed in Table 10 and Table 11. However, it is noted that this rating does not incorporate all foreshore values (e.g. cultural, social and ecological value) or consider an overall management strategy. Most foreshore segments with a high OCI-L rating are narrow and contain limited remnant vegetation, resulting in the same or relatively similar ecological scores. Jeff Joseph Reserve, while supporting a broader and more diverse vegetation community with a wider buffer, remains vulnerable to vegetation loss and damage due to its exposure to inundation and wind-wave action—pressures comparable in magnitude to those affecting the steeper but more sheltered sections of the Canning River foreshore. The site prioritisation results (Appendix 4) confirm that OCI-L scores are consistent with the broader foreshore ranking outcomes.

8.5.7 Local Priority Areas

Approximately half of the natural and built assets were identified to have points where the local condition was significantly worse than the overall asset. These features typically represent initial points of stress, whose degradation can lead to more widespread worsening of the condition. In these cases, local points of stress can either be the ‘best’ or ‘worst’ points for effective early intervention:

- Where local degradation instigates points of weakness that will progressively worsen, then early intervention is cost-effective and valuable.
- Where local degradation is symptomatic of a widespread pressure, and fixing these points will not address the issue, or can exacerbate the problem (e.g. downdrift erosion), then early intervention is a waste of resources.

Distinguishing between the two situations is not always straightforward. Consequently, a preliminary interpretation of local priority areas has been developed based on the site assessments and apparent

mechanisms for pressure. These may require targeted consideration by the City of Melville, based on a deeper understanding and a longer-term perspective of the sites.

Table 13. Local priority areas key management actions.

COM	# Segment number	**Local Works:** higher priority in **bold**. Lower priority marked with *.
01	3	Extend scour toe protection landward
03	25	Repair the irrigation system. Infill / regrade scarping. Patch damaged GSC.
06	39	* Infill planting. Locally reinforce vegetation adjacent to ramp carpark.
06	40	Fix steps & reinforce adjacent slope.
06	44	* Review the gabion function/repair the gabions
07	47	Infill planting for 10m
08	**49-50**	**Apply a managed retreat approach, including progressive removal of vegetation and reticulation. Eroded 26m since 1995.**
10	60	Infill planting
10	63	Extend revetment from 62 to eroded area
10	68	Extend walling
11	**71**	**Install new end-point control. Renourish, with ongoing replenishment.**
11	74	* Renourish
11	76	* Consider infill
11	78	Review stair removal & revegetation, or reinforcement. Revegetation on low rock headland. Treatment subject to gabion removal/modification.
11	84	Path reinforcement & infill planting
11	85	Raise the low section of the revetment
11	86	Infill planting
12	91	* Consider brushwall removal & regrade OR extension. Longer-term will require armouring.
12	92	* Monitor tree root exposure. Monitor swale for salinisation/breaching.
13	94	Fix potholes (safety)
13	96	Rebuild the revetment next to the drain
13	98	Fix the revetment connection near 18
13	103	* Trial seasonal renourishment
13	100-110	Infill path reinforcement
13	109	Local treatment at the Regent Way drain
13	109	Local tree protection. Fix pitching at the benches.
13	110	Repair drain

Refer to GIS database for segment number locations.

8.6 AQUATIC INFRASTRUCTURE CONDITION SUMMARY

The key findings for the aquatic infrastructure condition (MP Rogers & Associates, 2024) are summarised below:

- 14 high-priority assets were identified with defects requiring remediation within 0–3 years (high priority); these include jetties, retaining walls, revetments, and viewing platforms.
- Gunbower Road Jetty and Bicton Jetty were among the most deteriorated, needing urgent structural repairs to the piles, with the estimated costs of $150,000 each.
- Point Walter Viewing Platforms – deck and steel corrosion repairs needed.

Common issues included pile damage, corrosion of steel components, loose fixings, and deteriorated decking and kerbing. For the revetments and river walls, the most common issues were loose rocks and missing or deteriorated mortar in the river walls.

Asset longevity varied widely, with remaining useful life ranging from <5 years (e.g. some deteriorated revetments along the Esplanade Road) to 50 years (e.g. Mount Henry Bridge Jetty).

Low-priority defects (e.g., paint loss, minor joint cracking) were also identified, suitable for future budgeting.

Immediate to 5-year remedial action was recommended for high-risk structures, whereas lower-risk defects were to be addressed opportunistically over the same timeframe, and regular monitoring was to be applied across all structures. Survey intervals are to align with asset condition and risk profile, with more frequent reviews for high-use or deteriorating infrastructure (e.g. jetties).

The key management actions for aquatic assets are outlined in Sub-precinct plans in Section 13.0. The inspections of structures are to be added to the maintenance schedule and the maintenance prioritised based on safety, life expectancy and the cost of works.

8.7 COMMUNITY CONSULTATION SUMMARY

As part of the renewal of the Foreshore Restoration Strategy, a Community Engagement survey was conducted to learn more about how the community interact with the City's Estuarine Reserve.

The "*Foreshore Strategy Review Snapshot*" (Appendix 8) presents the outcomes of an extensive community engagement conducted by the City of Melville in April and May 2024. The initiative aimed to understand public perspectives on foreshore management and inform the ongoing Foreshore Strategy Review and preparation of the FMP. Key themes from Community Feedback are outlined below:

1. Community Priorities and Concerns

- Strong concern for environmental degradation, climate change resilience, and wildlife protection.

- Desire for a balance between development and conservation, with a call for the community's voice to be considered in decision-making.

2. Protection and Preservation Actions

- Support for reduced recreational pressures (e.g., dog walking, water sports).
- Emphasis on erosion control, native vegetation planting, and stricter regulation enforcement.
- Improved infrastructure and access, including pathways and river entry points.

3. Vegetation and Tree Management

- Over 74% of respondents advocated for more vegetation in foreshore areas, especially native and drought-resistant species.
- High importance placed on tree canopy preservation (over 69%) and additional tree planting, particularly in open or degraded areas.

4. Wildlife Conservation

- The community called for habitat creation, control of invasive species, and educational efforts to protect wildlife.
- Key actions include expanding native vegetation, installing nesting boxes, and managing dog access.

5. Human Impact and Restoration

- Nearly half of the respondents expressed concern about human impacts such as littering, soil compaction, and disturbance to wildlife.
- Suggested responses included public education, enhanced regulation, and better-designed infrastructure to mitigate these effects.

6. Enhancing Visitor Experience

- Recommended improvements include accessible infrastructure, safety enhancements, environmental signage, and more community events.
- Support for Aboriginal cultural education and recognition through signage, art, and events.

7. Education and Engagement

- Broad interest in community-driven education programs, including interactive learning, virtual tours, and school visits.
- Advocacy for incorporating Noongar traditional knowledge and fostering community stewardship through volunteering.

The outcomes of the community consultation and the recorded environmental and cultural aspects of the site form a set of values for the foreshore zone. These values, alongside threats to these values, form the basis of foreshore management actions.

8.8 KEY PROJECT IMPLEMENTATION 2019 – 2025

As a result of the 2019 Foreshore Strategy Review and the development of master plans for the Attadale to Alfred Cove Foreshore and the Goolugatup Lowlands, a range of foreshore restoration projects were implemented, supported by relevant grant funding. The projects, delivered between 2019 and 2025 (Table 14), focused on infrastructure renewal, bioengineering, revegetation, and increasing community engagement. Key works included revetment construction and repairs, brushwall installation, removal of redundant infrastructure, and the development of new platforms and pathways. The majority of projects were managed by the City with support from external contractors and in collaboration with community groups such as SERAG, BEAG, and newly formed partnerships with Landcare and DBCA. The formation of a new partnership with the DBCA, formalised through a Memorandum of Understanding, will support the long-term implementation of the Attadale–Alfred Cove Foreshore Masterplan and improve alignment of restoration activities within the City's Foreshore areas with regional conservation goals.

The program emphasised ongoing maintenance, weed control, and environmental restoration, with valuable lessons learned around preventative maintenance, adequate irrigation, and managing delays caused by approvals and COVID-19 impacts. Community involvement played a vital role, with volunteers contributing thousands of hours toward advocacy, education, and on-ground restoration efforts.

Table 14. Foreshore restoration works for the 2019 – 2025 period

Year	Project/s	Description	Current status
2019 - 2020	Canning Bridge River Wall Renewal	River wall & revetment repairs Shared use path reinstatement Revegetation	Complete - maintenance ongoing
2019 - 2020	The Esplanade (Apex Park) & Coffee Point revetments	Revetment construction at two sites Revegetation	Complete - maintenance ongoing
2020 - 2021	Bicton Water Polo Revetment & Wall	Revetment repointing & repairs Boat ramps repairs/closure Stormwater drain repairs	Complete - maintenance ongoing
2020-2021	Melville Beach Road bioengineering	Brushwall construction Revegetation	Complete - maintenance ongoing
2021 - 2022	Attadale Alfred Cove Foreshore Masterplan development	Community led 20 year report on the preferred concepts/options for the Attadale Alfred Cove foreshore	Complete - project implementation underway

Year	Project/s	Description	Current status
2021 - 2022	Various foreshore works: Blackwall Reach Pde Waylen Bay Scouts Heathcote Site D	Revetment construction Revegetation	Complete - maintenance ongoing
2022 - 2023	Heathcote West	Bioengineering Revetment repair & construction Revegetation	Complete - maintenance ongoing
2022 - 2023	MBS bird viewing platform	Platform construction Revegetation	Complete - maintenance ongoing
2023 - 2024	Melville Beach	Brushwalling Stair construction Revegetation	Complete - maintenance ongoing Vegetation establishing
2023 - 2024	Djinang Djidimya revegetation	Revegetation	Complete – maintenance ongoing Vegetation establishing
2023 - 2024	ABC Bushland Reserve	Shared use path removal Revegetation	Complete - maintenance ongoing Vegetation establishing
2023-2024	Majestic Cove	Revegetation Minor foreshore works	Ongoing
2024 - 2025	Point Walter boat ramp (west)	Removal of defunct boat ramp Renourishment	Ongoing
Outstanding projects			
2014-2019 and 2019-2024	Canning Beach Rd revetments	Repair and reinstatement of revetments	Emergency repairs carried out in 2018; major project pushed back
2019-2024	Blackwall Reach cliff surveys	Survey	Applied for grant funding for cliff surveys in 2017, 2019 and 2020 - all declined. Currently City continues to monitor for safety.
2019-2024	Blackwall Reach foreshore stabilisation	Erosion mitigation at the northern end of the sub precinct.	Design and construct not commenced.
2019-2024	Esplanade projects - Queen Street	Design and implement foreshore stabilisation (likely revetment).	Design and construct planned for

Year	Project/s	Description	Current status
			2025/26. Commenced
Additional project	Blackwall Reach revegetation (Stage 3)	Revegetation undertaken in conjunction with footpath repairs; dependent on Works	Pathway works completed in 2025 and revegetation ongoing to 2027.

Past activities indicate that, on average, the foreshore management team can generally undertake one major restoration project every one to two years, due to the effort required for consultation, finalisation of design, and later implementation works. In addition to the significant project, the team manages several smaller projects in revegetation and weed control, both independently and in collaboration with local Landcare/Friends of groups and the DBCA.

Fast-tracking projects is possible, but it is generally associated with poor site preparation and weed management issues, which are exacerbated by continual and frequent public use of the foreshore, preventing the team and contractors from addressing weeds in high-use areas promptly. Confusion between native marine couch and invasive Couch is also an issue that requires addressing in the future through training and employment of selective herbicide options.

8.9 PROJECT PRIORITISATION FOR 2025 – 2030

During the workshop with the City of Melville and DBCA, five Priority 1 sites were collaboratively identified as the highest priority for restoration over the next five years. These sites were selected based on the extent of existing damage and the presence of clear threats to infrastructure, ecological values, and public safety. The top five sites are listed below and relevant concept plans provided in Appendix 9. Additional management actions are provided in Section 13.0 as part of sub precinct action plans.

- **Coffee Reserve** – has a high level of erosion close to the pathway, highly likely to worsen in the short term, and poses a safety risk to the public. The proposed concept incorporates revetment extension, renourishment and regrading, movement of the pathway away from the shoreline, revegetation with sedges and brushwall with a rock toe. A brushwall barrier to the downstream end of the site, oriented at an angle to river flow and boat wake from berthing vessels in the SoPYC marina, is also proposed to assist with sediment capture. for further interrogation and detailed design.

- **Canning Road Foreshore** – Extending from the Raffles Hotel to Coffee Point Reserve, this section comprises a mix of degraded natural shoreline and deteriorating rock revetment and riprap. While limited revegetation is possible at the southern end, implementing nature-based stabilisation measures is currently constrained by the steep embankment and narrow land buffer between the foreshore and the existing pathway and road. Water Corporation's two sewage pumping stations and associated infrastructure further restrict opportunities for rehabilitation.

Achieving a stable vegetated shoreline would require regrading the embankment to a 1:6 slope, extending approximately 10 m landward from the existing shoreline. This would involve relocating the pathway, narrowing the road, shifting services and utilities, and removing most roadside parking. Although feasible, this approach would require extensive consultation with stakeholders and the community, as well as significant capital investment from state and federal governments.

Rebuilding the existing revetment provides short- to medium-term shoreline stability while maintaining the current road and pathway alignment. However, it offers limited ecological or amenity benefits, further constraining the foreshore buffer and resulting in loss of sedges at the revetment base due to stone embedment or encroachment into the river.

To align with state objectives for softer, climate-adaptive foreshore management, repairing and renourishing existing revetment and riprap are recommended as interim measures while detailed studies and planning determine a long-term strategy. Revegetation of less constrained areas, such as the foreshore adjacent to the Raffles Hotel, should proceed under this Foreshore Management Plan alongside revetment repairs, some of which need to be raised to reduce the impact of overwash. Key priority sites have been marked on the concept plan.

- **Esplanade foreshore** (north and South of Deepwater Point) presents complex site conditions, including variable slopes, deteriorating protection structures, and a narrow corridor constrained by the shared path, road, and underground services. These factors limit opportunities for large-scale nature-based restoration. Unlike Canning Road, the buffer is much narrower, thus opportunities for selective vegetation buffer widening are reduced. A coordinated strategic planning approach is required involving the City engineering and environmental teams, state agencies (i.e. DBCA) services, utility providers and the community to determine a climate-resilient design that maximises nature based solution opportunities. Implementation of major enhancement works will depend on state and federal funding support and alignment with broader foreshore adaptation priorities.

  Wave climate and sediment transport assessments indicate northward sediment movement and localised erosion, particularly in the southern embayment. While conceptual shoreline realignment and control point spacing have been considered, detailed feature survey, hydraulic, geotechnical, and infrastructure investigations are required before progressing to design.

  In the interim, management focuses on targeted repairs and stabilisation using a combination of rock riprap, brushwalling, revegetation, and sediment renourishment to protect assets and maintain foreshore function. Longer-term planning must integrate outcomes of road, drainage, and pathway infrastructure upgrades, as these will influence the feasibility and alignment of future foreshore treatments. The concept plan highlights high priority areas to work on and options for restoration while long term plans for the site are developed.

- **Jeff Joseph Reserve** – This low-lying foreshore is prone to flooding and ongoing erosion, evidenced by continual loss of vegetation and sediment. These pressures are expected to intensify with future sea-level rise. Although the reserve currently has a relatively wide

vegetation buffer, the absence of sedges along the shoreline exacerbates erosion, as the existing Acacia shrub layer provides limited soil stabilisation compared to a dense sedge belt.

To improve shoreline stability and resilience (i.e. slow progress of erosion), it is recommended to widen the existing vegetation buffer and establish a continuous sedge belt along the foreshore front. The sedge zone would need wave protection to establish, and hence brushwalls are recommended in the interim alongside pruning of some larger shrubs to allow light penetration necessary for optimal sedge growth. Once established, sedges will help dissipate wave energy, trap sediment, and help stabilise the soil, while the widened vegetation buffer will provide additional protection from flood and erosion impacts and allow for progressive landward retreat over time. This approach aligns with nature-based adaptation principles and will enhance both the ecological and protective functions of the reserve. This project can be implemented in stages for the term of the FMP by the City's foreshore / natural areas teams, directly supported by the local environmental groups and the community (e.g. workbees, community planting days, etc).

- **Majestic Point Beach** – This narrow sandy foreshore offers opportunities for low-impact restoration through targeted revegetation, without the need for extensive bioengineering or hard structural works. Restoration should be coordinated with any future pathway upgrades, ensuring that rehabilitation aligns with infrastructure planning and maintains access and amenity.

  Given site constraints, including historical infill and gabion cages reportedly supporting the pathway, all works will require careful planning and on-site assessment. A bottom-up restoration approach is recommended—beginning with the careful removal of invasive weeds and regrading the slope to improve stability and planting conditions. Only mature sedges are to be used for restoration supported by irrigation to establishment. This will enable successful establishment of native sedges and other foreshore species, enhancing resilience to erosion and creating a natural transition between the river and the land.

PART C: FORESHORE MANAGEMENT

This section of the FMP outlines the environmental threats, recommended management actions, targets, and performance criteria to manage the foreshore area. It captures the following key considerations:

- Vegetation retention, protection, and enhancement – restricting access to retained vegetation and conducting weed control and planting to improve native vegetation cover in specified areas within the foreshore.
- Fauna habitat protection – native and non-native fauna management measures within the FMP;
- Climate adaptation and mitigation of erosion and inundation risks;
- Heritage – minimisation of impacts to sites of cultural heritage value and provision of information to improve understanding of all visitors;
- Waste – provision of appropriate waste collection facilities and management to prevent environmental damage /contamination and impacts to human health;
- Stormwater management – reducing the impact of stormwater runoff from residential areas in minimising erosion, sedimentation and accretion;
- Water quality – preventing pollution and managing water quality across the FMP area and into adjacent areas (Acid Sulphate Soil Risk Mitigation, landfill (potentially contaminated) management, sewer overflows into the estuary.
- Disease and pests – spread of Phytophthora (Dieback) and polyphagous shot hole borer.
- Provision of amenity – public access, recreational infrastructure, formal beach access, toilets, water fountains, emergency and maintenance vehicle access, safety management;
- Bushfire management – vegetation management for bushfire risk reduction consistent with the City's Bushfire Management Plan.

9.0 ENVIRONMENTAL THREATS AND THEIR MANAGEMENT

9.1 EROSION

Foreshore erosion is a major threat, driven by a combination of natural and human-induced factors. Key contributors include tidal action, wind-generated wave energy, informal pedestrian access, stormwater runoff or broken irrigation and in select areas, the boat wake. These processes cause scouring or undercutting of banks, and loss of vegetation.

Climate change is expected to intensify these effects through more frequent extreme weather events and sea level rise, leading to a gradual landward shift of coastal zones and the loss of upper foreshore vegetation. In parallel, prolonged drought and increasing salinity place additional stress on vegetation, reducing stability and natural resilience.

Recommended Management Actions

- Stabilise shoreline using dense sedge and rush plantings and deep-rooted native vegetation on the upland areas
- Reshape bank to a more stable form and revegetate. Use sustainable and biodegradable erosion control structures such as brushwalls, brush matressing, coir logs where possible or rock armouring (e.g. rock rip rap, revetments etc).
- Retrofit stormwater outfalls to reduce discharge velocity and manage sediment and pollution.
- Monitor shoreline movement and incorporate sea level rise projections into long-term planning.
- Promote drought-tolerant and salt-tolerant species in restoration programs to maintain vegetative cover.
- Restrict access in erosion-prone areas to minimise further disturbance.

9.2 ACID SULFATE SOILS

Potential acid sulfate soils are present within low-lying areas of the foreshore and pose a risk if disturbed during earthworks or drainage changes. Exposure of these soils to oxygen can trigger chemical reactions that produce sulfuric acid, leading to acidification of soil and water, mobilisation of heavy metals, and vegetation dieback.

Recommended Management Actions

- Avoid soil disturbance in known or high-risk ASS areas wherever possible.
- Conduct preliminary soil assessments consistent with the WA Department of Water and Environmental Regulation (DWER) guidelines prior to excavation.
- Where disturbance is necessary, implement a site-specific ASS management plan, including soil neutralisation and containment measures.
- Regularly monitor pH levels in soil and surface water within identified risk zones.

9.3 WEEDS

Weed invasion is a significant threat to foreshore ecosystems, competing with native plants for light, water, and nutrients. Weeds alter vegetation structure, reduce biodiversity, and can increase the risk of fire and erosion, as it is commonly encountered along the foreshore. Disturbed areas with high

public access and stormwater damage are particularly susceptible to weed impacts and interfere with restoration efforts. The illegal dumping of garden waste, such as lawn clippings, as well as seed spread from garden beds, also contributes to weed proliferation.

Recommended Management Actions

- Undertake routine weed mapping and monitoring.
- Prioritise control of high-threat species and early intervention in new infestations.
- Use manual removal, targeted herbicide application, and mulching as appropriate.
- Integrate weed control with revegetation to suppress regrowth.
- Avoid soil disturbance and maintain groundcover to reduce weed colonisation.

9.4 HABITAT DEGRADATION AND RECREATIONAL PRESSURE

High levels of recreational use are contributing to trampling, understorey loss, soil compaction, and vegetation fragmentation, particularly within sedgelands and or saltmarsh. This reduces habitat quality and affects fauna such as migratory birds, reptiles, and small mammals. Vandalism of vegetation (e.g. tree poisoning and vegetation clearing by local residents), property (e.g. seating, pathways, signage) or dumping of rubbish and garden waste further contribute to loss of biodiversity and amenity.

Recommended Management Actions

- Guide public movement with designated paths, boardwalks, viewing platforms and fencing in sensitive areas.
- Rehabilitate disturbed areas with appropriate native species and erosion control techniques.
- Provide interpretive signage to raise awareness of ecological values and promote responsible visitor behaviour.
- Monitor high-use areas for degradation and adapt management where needed.

9.5 INVASIVE FAUNA

Non-native fauna such as rabbits and Rainbow Lorikeets pose ongoing threats to biodiversity and native fauna habitats through grazing, competition with native species, spreading disease and physical disturbance to soils and vegetation. These pressures reduce habitat suitability and hinder revegetation success. Domestic pets like cats and dogs also pose a disturbance to native fauna species.

Recommended Management Actions

- Implement targeted control in accordance with WA biosecurity regulations.
- Monitor invasive species distribution and impacts.

- Engage with community to discourage feeding (e.g. seeds for birds) and management of pets like cats and dogs.

9.6 PLANT PATHOGENS

Foreshore vegetation is at risk from a number of serious pathogens that threaten tree health, reduce canopy cover, and degrade wildlife habitat. These include both endemic and introduced diseases, some of which are soil-borne or spread by insect vectors:

- *Phytophthora cinnamomi* (dieback) – causes root rot in a wide range of native species.
- *Armillaria luteobubalina* – fungal root rot affecting woody plants.
- Canker diseases (e.g. *Quambalaria* spp.) – lead to branch dieback and canopy loss.
- *Austropuccinia psidii* (myrtle rust) – impacts Myrtaceae species such as Melaleuca and Eucalyptus
- *Euwallacea fornicatus* (polyphagous shot-hole borer – PSHB) – an invasive beetle that damages trees by introducing symbiotic fungi into the vascular system.

Currently, PSHB has been confirmed as present within the foreshore area, and several trees require further examination. In addition, Dieback has also been recorded within the Attadale Bushland and Point Walter areas.

Recommended Management Actions

- Apply hygiene protocols for all equipment, vehicles, and footwear.
- Restrict access to infected or high-risk areas.
- Monitor vegetation health regularly and report signs of decline.
- Remove and dispose of infected material per WA DPIRD guidelines.
- Engage arborists for assessment and treatment.
- Promote plant health through appropriate species selection, mulching, and reduced disturbance.

9.7 FIRE

Fire is a significant threat to foreshore areas, with the potential to damage native vegetation, wildlife habitat, infrastructure and nearby properties. Fires can be caused by natural events such as lightning, but are more commonly started by human activity (e.g. deliberate or accidental). Climate change, invasive species, and the build-up of dry vegetation increase the risk and intensity of fires. Some of the key issues related to fire are loss of vegetation and canopy cover, fauna habitat, increased erosion and weeds and difficulty in recovery of already stressed ecosystems.

While no major fires have recently occurred in the foreshore area, dry conditions, unmanaged vegetation and high visitation by the public increase the risk.

Recommended Management Actions

- Reduce fuel loads through careful slashing, thinning, or controlled burns.
- Maintain firebreaks and emergency access routes.
- Use signage to warn of fire danger and educate the public in fire prone areas.
- Follow City's Bushfire Risk Management Plan 2022 -2027.
- Replant and stabilise burned areas with local native species.

10.0 TIMING AND PRIORITIES

The Foreshore Management Plan (FMP) is structured for implementation over a five-year period, with general management actions and performance targets to be reviewed and updated in 2030.

Sub-precinct management actions have been prioritised according to the location and severity of identified issues. This includes the top five sites for which concept plans have been developed, guiding targeted remediation and restoration works in the short to medium term. A generalised annual maintenance schedule is provided in Appendix 10 to indicate timing for majority of the maintenance and restoration works. This schedule is not exhaustive and should be reviewed and updated periodically to incorporate additional works.

11.0 MANAGEMENT RESPONSIBILITY

Foreshore management is complex and interdependent, requiring coordination between the City's Natural Areas, Parks, Sustainability, Planning, and Infrastructure teams. As a significant section of the foreshore is State-vested land managed by the DBCA, collaboration between the City and DBCA is essential to maintain and enhance foreshore ecosystem health in an integrated and efficient manner.

The Foreshore Management Team will oversee ongoing coordination, monitoring, and annual reviews of actions to support adaptive management and continuous improvement in foreshore planning and restoration outcomes.

All foreshore-related activities, such as infrastructure renewal, new installations (e.g. drainage or pathways), and event management, must be coordinated through this team to ensure consistency with ecological and community objectives. Open communication between teams is critical to incorporate considerations such as public use, heritage, and safety into planning and implementation.

Externally, the DBCA is the lead management authority and should be consulted on all works beyond routine maintenance. Community groups, including BEAG, FO Applecross FS, FMBS, and SERAG, play a vital role in weed control, revegetation, and stewardship, providing valuable on-ground support while also providing important pathways for securing community grants that support small-scale

restoration works. The City seeks to empower Whadjuk Traditional Owners and the wider community to manage the foreshore through various engagement initiatives, including Citizen Science, ensuring that foreshore management is collaborative, culturally respectful, and well-integrated.

12.0 ASSESSMENT CRITERIA AND INTEGRATION WITH OTHER MANAGEMENT PLANS

The implementation of both general and site-specific recommendations will be assessed through ongoing site monitoring and maintenance over the next five years, and formally reviewed in 2030 as part of this Plan's five-year review cycle. To support this process, a target column in Table 15 has been included to assist in tracking progress against key actions and performance indicators. These will be used in conjunction with sub-precinct action tables to evaluate the team's efforts in foreshore management.

The targets are consistent with and supported by the City's key environmental frameworks, including the Natural Area Asset Management Plan, Bushfire Risk Management Plan, Urban Forest Strategic Plan, Corporate Environmental Strategic Plan, Corporate Sustainability Policy, and Community Climate Action Plan. Together, these documents provide a coordinated framework to protect natural assets, address climate change, reduce environmental risks, and enhance community resilience and amenity.

Table 15. Overarching foreshore management actions

Outcome	Action No.	Action	Targets	Performance Indicators	Key management concern addressed	Lead Responsibility	Strategic Objective Reference
Healthy, Safe and Inclusive	1.1	Enhance community wellbeing through inclusive design and programming	Increase wellbeing program participation by 20% by 2030. Ensure future projects incorporate community well-being as one of the key design objectives.	Community wellbeing events; inclusive infrastructure implementation rate; safety incident reports.	Community consultation and management of expectations	Healthy Melville	1.1 Facilitate a sense of community, wellbeing, social connection, and participation.
	1.2	Foster a safe, accessible, and inclusive foreshore	Ensure 100% compliance with inclusive infrastructure standards	Same as above	Plan for and mitigate (or increase the capacity to adapt to) the impacts of climate change and SLR on foreshore-based public infrastructure and ecological communities.	Healthy Melville	1.2 Provide a range of inclusive local community services, events and cultural activities.
	1.3	Install additional amenities to meet community needs.	Increase accessibility by 20% over 5 years	Number and accessibility of drinking fountains, including modifications for dogs and toilets based on park's hierarchy and feasibility of works	Provision of walkways, lookout accessways and improved amenities (e.g. toilets and car parking).	Natural Areas and Parks	1.3: Foster an inclusive and connected community

Outcome	Action No.	Action	Targets	Performance Indicators	Key management concern addressed	Lead Responsibility	Strategic Objective Reference
Healthy, Safe and Inclusive	1.4	Install safer, inclusive infrastructure (e.g. inclusive signage and wayfinding along river trails)	Upgrade lighting in 2 high-use foreshore zones by 2029. New directional signage system installed in 3 foreshore sub-precincts	Number of upgrades (e.g. lighting, ramps, wayfinding signage).	Poor signage and lighting.	Parks	1.3 Improve community safety and security.
	1.5	Install interpretive signage to educate the public on foreshore ecology and conservation efforts.	Install 10 signs across key foreshore locations by 2028	Number of signs installed; public engagement metrics	Vandalism of vegetation and infrastructure. Public participation and education.	Natural Areas and Parks	2.3 Enhance and protect natural ecosystems
	1.6	Maintain safe access infrastructure	No accidents, incidents or damage caused due to poor maintenance	Inspection and repair frequency	Reduce costs associated with repairs and incidents via regular maintenance.	Engineering	1.3 Improve community safety and security.
	1.7	Improve access infrastructure through upgrades e.g. upgrade paths to promote active transport: walking, cycling.	Kilometres of new shared paths	Same as 1.5	Maintain and improve public access along the estuary foreshores and waterway, without compromising estuarine health.	Healthy Melville and City Buildings	1.4 Provide inclusive multipurpose places and facilities to encourage healthy lifestyles and wellbeing.
	1.8	Incorporate Indigenous knowledge in foreshore planning	All foreshore planning and design is to incorporate cultural knowledge and draw upon this knowledge to better plan for and manage the foreshore.	Instances of Indigenous input: partnership records	Promote public awareness of cultural heritage in and around the estuary.	Cultural Services	1.2 Provide a range of inclusive local community services, events and cultural activities.

Outcome	Action No.	Action	Targets	Performance Indicators	Key management concern addressed	Lead Responsibility	Strategic Objective Reference
Clean and Green	2.1	Protect and restore foreshore ecosystems and increase canopy cover.	Maintain 100% of foreshore zones in good or better condition, improve 20% of degraded zones, and increase tree populations in foreshore sub-precincts by 2030.	Hectares revegetated; urban canopy% %; biodiversity counts.	Low habitat value, poor connectivity between habitats.	Natural Areas	2.1 Protect and enhance our natural environment, ecosystems and biodiversity.
	2.2	Stabilise foreshore utilising predominantly nature-based solutions (revegetation and bioengineering) and limit hard structures where NBS cannot be applied.	Utilise NBS foreshore restoration methods wherever possible. Complete a minimum of three high priority projects incorporating NBS (e.g. expansion of vegetation buffers via revegetation landward, and revegetation of riparian edge with or without bioengineering.	Number of foreshore segments incorporating NBS.	Bank Condition / Slope stability / Erosion mitigation	Natural Areas – Foreshore Team	2.2 Sustainable use of resources and adoption of a circular economy approach, optimising waste
	2.3	Remove invasive species and implement weed management plans along the foreshore	Contain existing weed spread within foreshore reserves and reduce invasive species cover in the foreshore areas by 20% by 2030.	Percentage reduction in invasive species cover.	Estuarine ecology, species resilience	Natural Areas – Foreshore Team	2.3 Enhance and protect natural ecosystems
	2.4	Stabilise the foreshore with vegetation that is native and endemic to the foreshore and increase the foreshore buffer. Reclaim areas of the grass foreshore to native vegetation	The foreshore restoration comprises of a minimum of 80% of indigenous native flora. Decrease turf area within the foreshore by 10% by 2030.	Erosion rates; native vegetation density. % of buffer zones vegetated or area of turf converted to native vegetation	Biodiversity, connectivity, fauna habitat	Natural Areas – Foreshore Team	2.1 Protect and enhance our natural environment, ecosystems and biodiversity. 2.5 Mitigate and adapt to climate change impacts. 2.6 Transition

Outcome	Action No.	Action	Targets	Performance Indicators	Key management concern addressed	Lead Responsibility	Strategic Objective Reference
Clean and Green							the organisation to carbon neutrality by 2030 and facilitate community progress to NetZero emissions by 2050.
	2.50	Enhance the natural environment through stewardship	Current community participation (as at 2025) is maintained and expanded on to increase educational opportunities, improve shoreline condition and maintenance and management of foreshore areas.	Community program participation; vegetation health indicators	Lack of coordinated estuary health monitoring program by the community (River guardians excepted).	Natural Areas	2.3 Increase the urban forest tree canopy on City managed land.
	2.60	Target foreshore sites with low canopy for tree planting	Number of trees within the foreshore is increased in areas lacking canopy cover by 15% by 2030.	Number of trees planted; canopy increase tracking	Lack of shade, climate adaptation targets.	Natural Areas – Foreshore Team	2.3 Increase the urban forest tree canopy on City managed land.
	2.70	Undertake seasonal weed control and revegetation	Target weed control at the optimum time in the season to maximise control effect, and facilitate revegetation while minimising the use of chemicals.	Frequency of activities; species balance metrics	Reduce the occurrence of weeds and pests in aquatic and terrestrial habitats in and around the estuary.	Natural Areas – Foreshore Team	2.1 Protect and enhance our natural environment, eco-systems and biodiversity.

Outcome	Action No.	Action	Targets	Performance Indicators	Key management concern addressed	Lead Responsibility	Strategic Objective Reference
Clean and Green	2.80	Implement water-sensitive urban design (WSUD) in foreshore renewal projects	Integrate WSUD in 100% of new foreshore works	Number of projects with WSUD features	Reduce sediments entering the estuary, particularly where sedimentation affects vulnerable ecological communities such as seagrass.	Engineering	2.4 Improve water quality and management
	2.90	Promote environmental awareness and education	Host four community education events annually (e.g. schools, Landcare groups or general community. Bird watching, night stalks, gardening with native plants (e.g. verges) etc).	Community education session records, community feedback (social pages)	Poor public education and participation.	Parks, Natural Areas and Foreshore Team	2.1 Protect and enhance our natural environment, ecosystems and biodiversity.
	2.10	Supply watering stations or roosting and nesting amenities for fauna such as bird waterers, bat boxes, etc.	At least one bird waterer installed by 2030.	Record of installation of bird waterer/s and the	Provide habitat for threatened fauna	Natural Areas	2.1 Protect and enhance our natural environment, ecosystems and biodiversity.
Sustainable and Connected	3.2	Conduct erosion control using sustainable materials at priority sites. Source materials locally where possible to avoid carbon miles.	80% of materials used for restoration are sustainably sourced.	Number of sites stabilised utilising sustainably sourced materials. No plastics are used for erosion control; a reduction in the erosion rate	Reduce plastic use and degradation in the environment	Natural Areas – Foreshore Team	2.3 Enhance and protect natural ecosystems

Outcome	Action No.	Action	Targets	Performance Indicators	Key management concern addressed	Lead Responsibility	Strategic Objective Reference
Sustainable and Connected	3.3	Monitor water quality and implement measures to reduce pollution entering the river	75 per cent of monitored ecosystem health data meets Swan/Canning respective targets (e.g. nutrients, DO etc) required for a healthy functioning ecosystem for the Bull Creek Catchment.	Water quality metrics; number of pollution incidents, increase in the use of turf / soil testing to manage nutrients for turf areas in the catchment, not just foreshore.	Reduce the level of contaminated sediment and other pollutant loads entering the estuary from catchment runoff. Reduce the incidence of sewer overflows affecting the estuary. Reduce the inflow of nutrients via strict fertiliser management (e.g. turf management).	Natural Areas / Environmental Health and actioned according to contamination source (Engineering, Parks, Water Corporation etc).	2.3 Enhance and protect natural ecosystems
	3.4	Engage with Indigenous communities to incorporate traditional knowledge in foreshore management	Establish two collaborative projects by 2030	Number of projects; level of Indigenous community involvement	Respect the Whadjuk Noongar culture and knowledge of the site. Provide pathways for reconciliation.	Natural Areas	2.3 Enhance and protect natural ecosystems
Vibrant and Prosperous	4.1	Activate the foreshore as a vibrant cultural space	Increase events by 20% annually e.g. sustainable seasonal markets; develop 2 new community spaces by 2030 e.g. yarning circles, bird hide or similar.	Event count; number of new spaces, satisfaction surveys	Poor safety and amenity.	Cultural Services	4.1: Strengthen and diversify the local economy
	4.2	Support eco-tourism initiatives at foreshore locations	Attract one new foreshore-based eco-tourism operator by 2030	Visitor numbers; operator satisfaction	Achieve recognition of the iconic status of Alfred Cove and other MBS areas.	Communications	4.2: Promote a vibrant arts and cultural scene

Outcome	Action No.	Action	Targets	Performance Indicators	Key management concern addressed	Lead Responsibility	Strategic Objective Reference
Vibrant and Prosperous	4.3	Identify suitable café location/s e.g. mobile café along Attadale Reserve (dog park)	Attract 1-2 mobile café/vendor providers for the foreshore area	Site feasibility; development status	Lack of defined spaces for social interaction. Large distances between cafés and amenities, particularly for Attadale foreshore.	Community Development	4.3: Enhance tourism and event opportunities
	4.4	Support Indigenous-led environmental programs	Conduct at least two knowledge share educational programs with local elders.	Number of programs; Indigenous partner feedback	Lack of opportunities for ranger involvement.	Cultural Services	4.2: Promote a vibrant arts and cultural scene
	4.5	Invest in public access and foreshore amenity	Provide shade trees and structures	Investment value; amenity audit results	Lack of amenity and shade in particular for some areas of the foreshore.	Natural Areas and Parks	4.1 Facilitate vibrant activated local places and centres.
Good Governance and Leadership	5.1	Engage transparently with stakeholders	Achieve 100% transparency in decisions by 2026; host bi-annual stakeholder forums	% decisions publicly shared; stakeholder participation rates	Misunderstandings and mistrust in the City led operations.	Customer First	5.1: Ensure transparent and accountable governance
	5.2	Use geospatial tools for progress tracking	Map out and classify foreshore areas within the GIS as part of City's Green Infrastructure network	Use of dashboards, maps, reports	Lack of coordinated data collection and monitoring.	Information Technology	5.3 Ensure efficient and effective use of assets, resources and technology.
	5.3	Strengthen enforcement and regulatory practices	Implement the Cat law	Compliance rates; enforcement actions	Feral animal management, including Cats.	Community Safety	5.1 Provide transparent and accountable

Outcome	Action No.	Action	Targets	Performance Indicators	Key management concern addressed	Lead Responsibility	Strategic Objective Reference
							good governance.
	5.4	Support cross-agency collaboration and develop shared objectives for specific foreshore management areas	Complete at least two foreshore collaborative projects with DBCA by 2029. Establish communication with Water Corporation to determine landscape extent of landscape improvement actions adjacent to and within WC owned land. Ensure CoM plans align with DBCA plans for foreshore restoration to maximise savings for various works (e.g. surveys, machinery, labour and materials)	Number of collaborative projects. Guidelines for revegetation adjacent to Water Corporation Land.	Financial and labour support. Research and Development.	Natural Areas – Foreshore Team	5.2 Ensure long term financial sustainability, strategic advocacy and partnerships, and diverse revenue streams.
	5.5	Support collaboration with Community Groups for Foreshore Restoration Efforts	Establish 2 collaborative projects by 2028	Number of collaborative projects and funding raised.	Funding for project implementation	Natural Areas – Foreshore Team	5.4 Strengthen active citizen engagement, participation and access to information.
	5.7	Establish climate resilience criteria in decision-making for foreshore projects	Climate criteria adopted in project approvals by 2026.	Number of projects evaluated using criteria	Climate change adaptation and management.	Corporate Governance	5.4 Embed sustainability and climate action in governance

13.0 SUB-PRECINCT ACTION PLANS

To complement the overarching foreshore management actions, concise summaries and action tables have been developed for each sub-precinct. These outline key management priorities and provide a framework for annual maintenance and capital works planning. The actions are not exhaustive and need to be considered by the maintenance and management teams alongside additional actions that may emerge over time. The actions should be reviewed by the City's maintenance and management teams each year to align with available budgets and outcomes from previous maintenance programs.

The listed actions are accompanied by a map for each sub-precinct showing key features and management points to follow up on. The maps have been annotated to show the location of particular issues relating to the action to be implemented (also provided in a tabular form). The location / action points are georeferenced and available as a shapefile. It is recommended that the foreshore management team/s are cognisant of this and utilise geospatial data to assist with planning, implementation and assessment of management actions.

NOTE: The maps distinguish foreshore segments by their physical type, consistent with classifications used in previous Foreshore Management Plans (e.g., revetment, bioengineering, sedimentary beach, rocky beach). Although these segments underpin the condition and prioritisation assessments, they were not used as the sole basis for defining management actions, as not all parts of a segment require intervention.

As noted in Table 15, the implementation of the listed actions will require coordination between the Natural Areas team and other responsible City teams.

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COM 1: QUAADA GABEE - BICTON BATHS AND BLACKWALL REACH PARADE

KEY FEATURES

Bicton Baths and Blackwall Reach Parade are popular destinations for both local residents and the wider community. The area provides opportunities for swimming and passive recreation, and is connected via the principal shared pathway to Kent Street beaches and Blackwall Reach.

The shoreline has experienced erosion, with approximately 54% now protected by limestone walls and revetments. The proximity of the road to the foreshore edge, as well as natural elevation, poses issues with implementing bioengineering and revegetation at the foreshore edge.

The site supports native vegetation such as *Juncus* sedgelands and *Acacia* shrublands with Tuart. Vegetation condition ranges from good to very good but is threatened by invasive species, including Couch grass and other high-priority grasses and geophytes.

ENVIRONMENTAL VALUES

- Remnant and planted shoreline vegetation including *Juncus* sedgelands and Acacia shrublands.
- Shade trees
- Bird habitat

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- Bicton Foreshore including Stam's Tearoom and Commonwealth Animal Quarantine Station (BN03) – Municipal Inventory

SOCIAL VALUES

- High recreational value
- Amenity
- Long term ongoing care of the Bicton Baths area by local volunteer group BEAG

KEY THREATS

- Erosion
- Vegetation loss due to trampling
- Weeds

Table 16. Key Management Actions for Quaada Gabee - Bicton Baths and Blackwall Reach Parade

No.	Management Actions	Priority for Management	Budget Allocation
COM 1. QUAADA GABEE - BICTON BATHS AND BLACKWALL REACH PARADE			
1	Reseal cracks on the boat ramp.	High	Maintenance
2	Remove high-priority weeds, including *Lantana camara*, and revegetate (revegetation area approx. 75 m^2).	High	Maintenance
3	Reinstate the concrete kerb.	Medium	Maintenance
4	Extend scour toe protection landward.	Medium	Capital Works Project
5	Repair jetty components as per MP Rogers 2024 Section 4.1. Monitor potential for undermining adjacent to the jetty.	High	Capital Works Project
6	Renourish sand and repair turf to improve safety.	Medium	Maintenance
7	Consider extending vegetation into the corner and to the path.	Low	Maintenance
8	Remortar joints and consider installing an appropriate scour protection in front of the wall.	High	Capital Works Project
9	Consider the removal of stairs and the installation of new stairs slightly further north.	Low	Capital Works Project
10	Repack revetment where geofabric is exposed.	Medium	Capital Works Project
11	Monitor and revegetate with dense sedges. Remove Couch.	High	Maintenance
12	Maintain vegetation buffer and control access. Remove high-priority weeds and revegetate.	High	Maintenance
13	Prune vegetation to offer views to the river in front of the bench and ensure no vegetation obstructs the pathway.	High	Maintenance
14	Remove high-priority weeds and revegetate	High	Maintenance
15	Remove turf and revegetate to path and drainage with sedges and low herbs such as *Conostylis candicans.*	Low	Capital Works Project
16	Brushwall is too low in the profile to work. Retain but install the next layer higher and revegetate densely with large sedges (*Juncus kraussii*). Consider typing into the existing revetment to the north.	Medium	Capital Works Project
17	Re-mortar joints, especially the lower sections of the wall.	Low	Maintenance
18	Re-mortar joints and block face, and consider placement of an appropriate scour protection in front of the wall.	Low	Capital Works Project

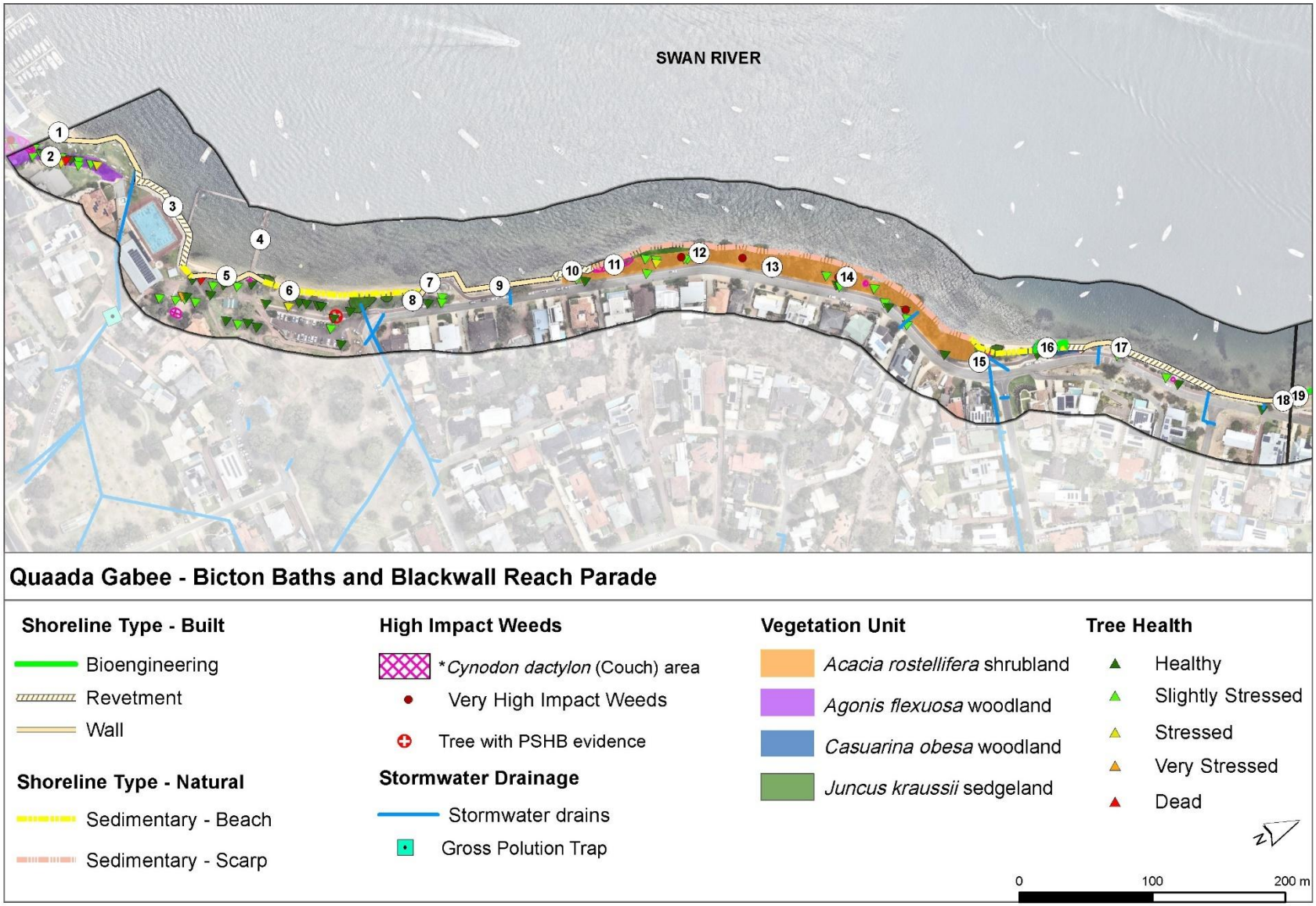


Figure 39. Quaada Gabee - Bicton Baths and Blackwall Reach Parade key management action sites

COM 2: JENALUP - BLACKWALL REACH CLIFFS, LITTLE BEACHES, INCLUDING KENT STREET

KEY FEATURES

Blackwall Reach Reserve is a site of exceptional natural, ecological significance, and significant cultural heritage that is unique in the City. Visitors can enjoy walking its trails, viewing the dramatic limestone cliffs, learn about Aboriginal Dreamtime stories, and observe native flora and fauna.
The site supports limestone heaths / Acacia shrublands with Tuart. Vegetation condition ranges from good to very good but is threatened by invasive species, including Couch grass, other high-priority grasses and geophytes.
Erosion is generally most prominent at the northern and southern extent of the sub-precinct, with sand loss from the shallow limestone platforms. Erosion of soils at the top of the cliffs is generally restricted to narrow informal tracks created by public accessing cliff areas. The erosion of limestone cliffs was not assessed and it is not known if any specific areas have suffered significant damage. Key management actions for this section are *monitor and maintain*.

ENVIRONMENTAL VALUES

- Remnant limestone shrublands and Tuart woodlands
- Shade trees
- Bird habitat

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- Blackwall Reach Bicton – Water Source Site 3650 ACH Historic Site
- Jenalup site of a dreamtime story of Djunda whose footsteps created the limestone cliffs.

SOCIAL VALUES

- High recreational value including diving
- Amenity
- Ongoing volunteering - BEAG – who help to revegetate and maintain the reserve.

KEY THREATS

- Weeds
- Erosion
- Pollution/rubbish
- Informal access and trampling of vegetation
- Fire
- Drought

Table 17. Key Management Actions for Jenalup - Blackwall Reach cliffs, little beaches, including Kent Street

No.	Management Actions	Priority for Management	Budget Allocation
COM 2. JENALUP - BLACKWALL REACH CLIFFS, LITTLE BEACHES, INCLUDING KENT STREET			
19	Brushwall is too low in the bank profile - regrade the bank behind existing sedges and revegetate densely. Attempt 1:4 slope. Install a new brushwall behind existing sedges.	Medium	Capital Works Project
20	Control Couch and revegetate with sedges.	High	Maintenance
21	Prune sedges in front of the stormwater outlet.	High	Maintenance
22	Localised areas on pile caps and headstocks with paint loss to be repainted. Monitor the corroded areas and consider additional protection treatments. Replace the missing chafer and sign.	Low	Maintenance
23	Upgrade pathway.	High	Capital Works Project
24	Repair the eroded pathway near the MV 15 sign.	High	Capital Works Project
25	Large infestation (*Brassica*, fleabane and prickly lettuce) of weeds to be treated in the short term and revegetated.	High	Maintenance
26	Repair fence (bent over as a result of unauthorised access).	High	Maintenance
27	Revegetate the upper foreshore. Consult with the Coastal engineer regarding the placement of any trees lost to erosion to facilitate sand capture.	High	Maintenance

Note: Condition of viewing platforms on the cliffs was not examined beyond visual appearance. The composite decking is in serviceable condition; however, many boards are warping. The inspection and servicing of these platforms is scheduled on a regular basis via the City's asset management system outside of aquatic assets like jetties or boardwalks over water, and hence not elaborated on in the FMP.

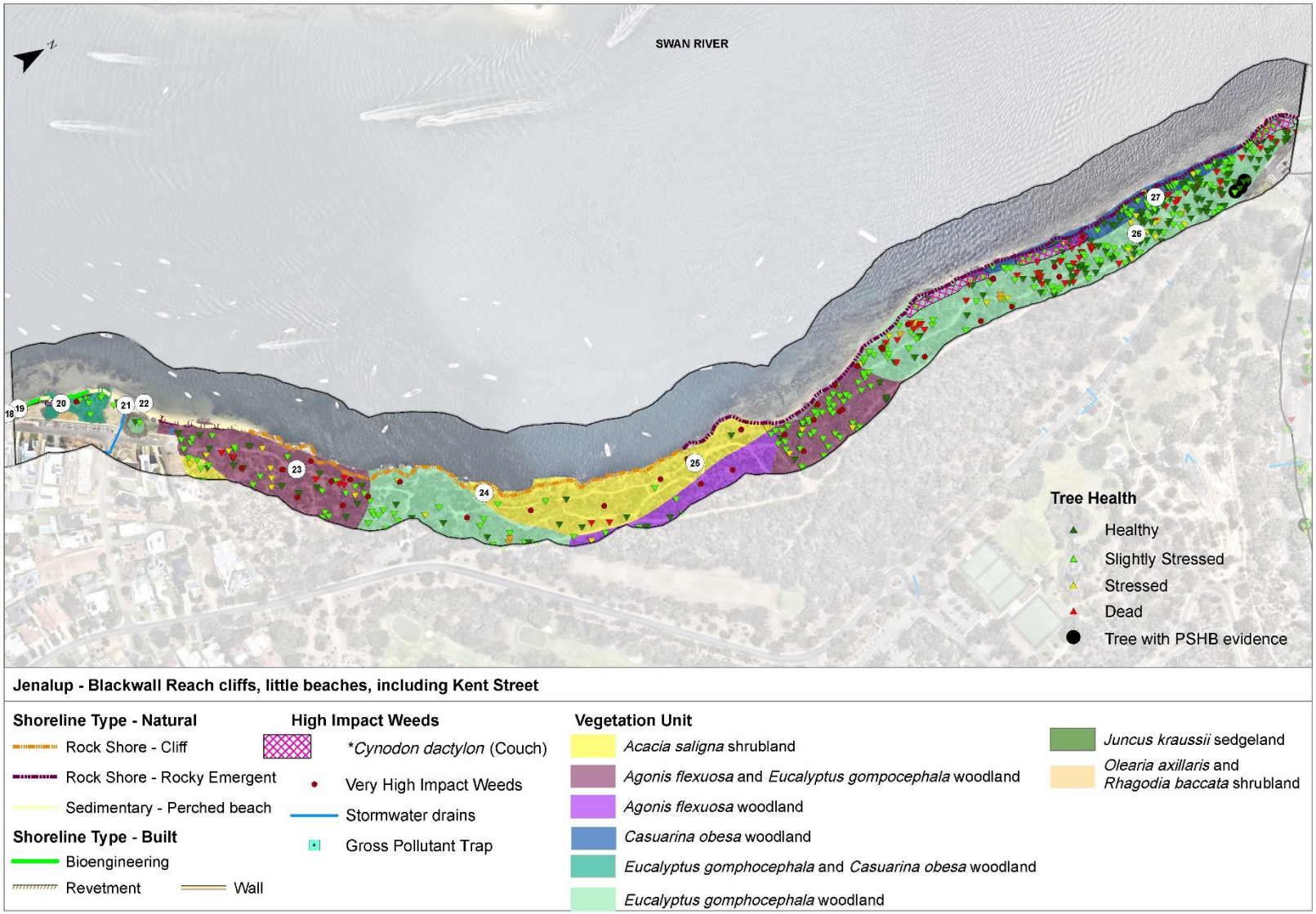


Figure 40. Jenalup - Blackwall Reach cliffs, little beaches, including Kent Street key management action sites

COM 3: DYOONDALUP - POINT WALTER FORESHORE RESERVE THROUGH TO ATTADALE DOG BEACH

KEY FEATURES

Point Walter is a culturally and ecologically significant reserve in the City of Melville, valued for its unique sandbar, and diverse wildlife (associated with the sand bar) and the remnant bushland backing the foreshore.

The site supports a wide range of recreational activities and features community facilities like playgrounds, a café, and event spaces and is therefore highly developed.

The shoreline continues to face erosion despite the installation of various limestone rock structures (groynes) designed to hold the sand. Due to its high public use and existing infrastructure and amenities, options for implementing nature-based solutions at this location are limited. The management recommendation is to repair, maintain, and plan for adaptation through a capital works project aimed at upgrading foreshore protection structures and amenities.

ENVIRONMENTAL VALUES

- Shade trees
- Bird habitat especially on the spit

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- Pt Walter Reserve (BN06), Honour Avenue and Caroll Drive and Blackwall Reach Parade - Municipal Inventory
- Dyoondalup site of a dreamtime story of Djunda whose hair strand created the limestone sandy spit.

SOCIAL VALUES

- High recreational value
- Amenity
- Dog beach adjacent to Attadale Bushland area

KEY THREATS

- Erosion
- Vegetation loss due to trampling and waves

Table 18. Key Management Actions for Dyoondalup - Point Walter Foreshore Reserve through to Attadale Dog Beach

No.	Management Actions	Priority for Management	Budget Allocation
COM 3. DYOONDALUP - POINT WALTER FORESHORE RESERVE THROUGH TO ATTADALE DOG BEACH			
28	Repack rocks in gaps along the crest.	Medium	Maintenance
29	Repair damaged concrete and monitor and repack exposed areas of revetment (ref MP Rogers, 2024 report).	Medium	Maintenance
30	Replace damaged timber and corroded elements on viewing platforms (ref. MP Rogers, 2024).	Medium	Capital Works Project
31	Remove Couch and Kikuyu grass stolons from the gabion cage and ensure turf is maintained to prevent this from recurring. Explore alongside turf renewal works.	Medium	Maintenance
32	Repack rocks to close out gaps that show geofabric, ensuring safety and erosion protection.	Low	Maintenance
33	Repack rocks to close out gaps that show geofabric, ensuring safety and erosion protection.	Low	Maintenance
34	Monitor erosion around the outlet drain and replenish with sand as required.	High	Capital Works Project
35	Monitor erosion and install temporary erosion control measures, such as Geotextile Sand Containers (GSC), to mitigate erosion until capital works are planned for the entire site. Tie bags to the existing revetment. Remove broken walling.	Medium	Capital Works Project
36	Repair broken sprinkler.	High	Maintenance
37	Implement temporary erosion control (e.g. Geotextile sand containers (GSC). Consider the modification of beach areas.	Medium	Capital Works Project
38	Repair damaged Geotextile sand containers (GSC).	Low	Maintenance
39	Block access to natural areas via revegetation and fencing.	Low	Maintenance
40	Persist with ongoing weed control (e.g. Couch and Evening Primrose) and revegetation.	High	Maintenance
41	Implement seasonal selective herbicide control to manage couch. Revegetate with *Juncus kraussii.*	High	Maintenance
42	Monitor erosion and implement mitigation techniques such as brushwalling as required.	Medium	Maintenance

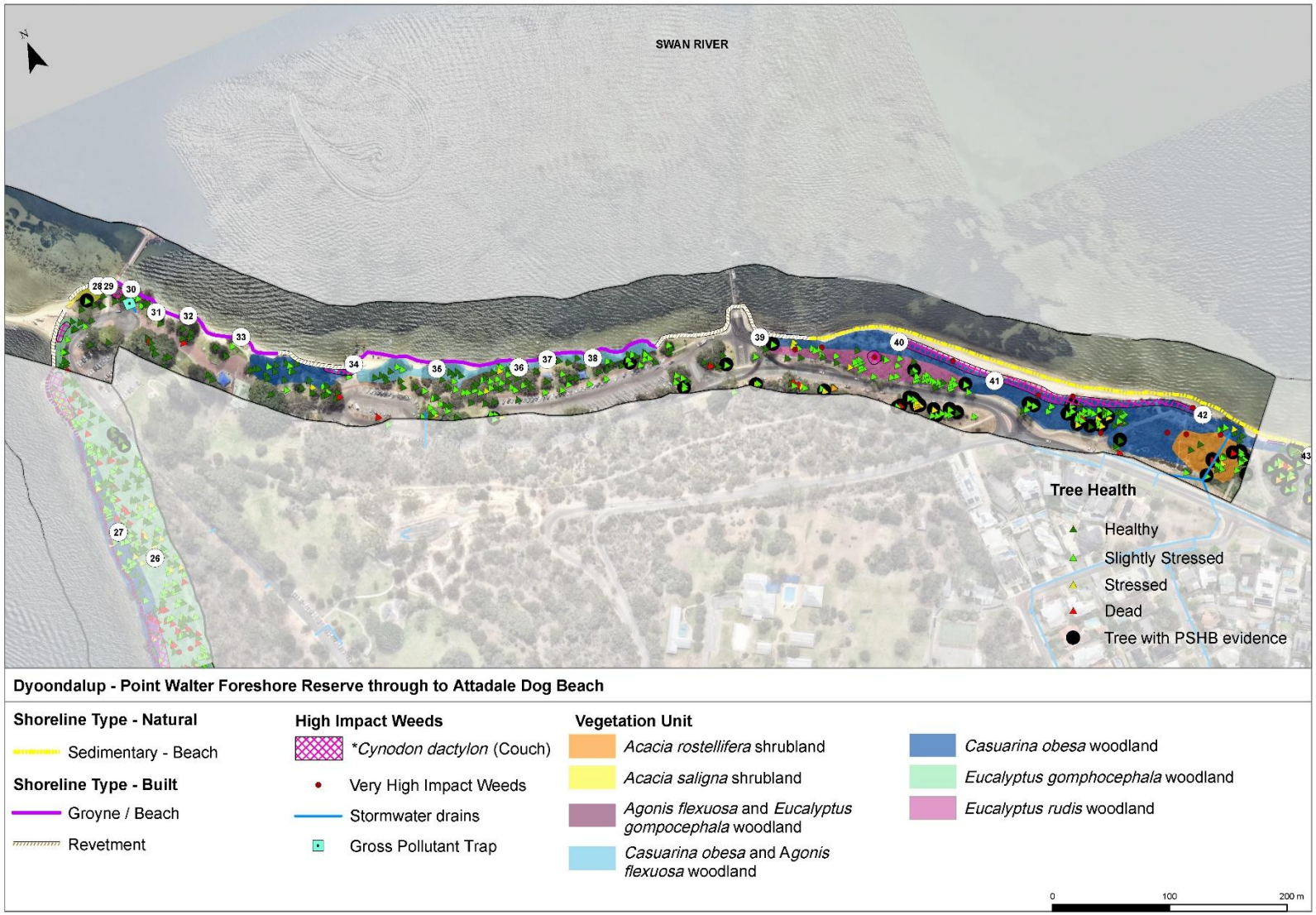
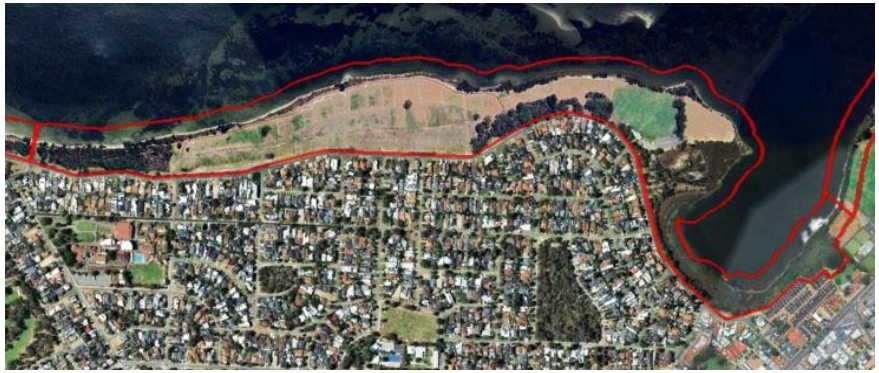


Figure 41. Dyoondalup - Point Walter Foreshore Reserve through to Attadale Dog Beach key management action sites

COM 4: MARRADUNGUP - ATTADALE RESERVE FROM PAGE STREET TO ALFRED COVE



KEY FEATURES

Attadale Reserve, stretching from Page Street to Alfred Cove, is the largest foreshore reserve within the City and includes the ecologically significant saltmarsh community of Alfred Cove. It borders the regionally significant Swan River Marine Park and forms a key part of the Melville Bird Sanctuary and Bush Forever Site.

The reserve supports a wide range of recreational activities, with its large open spaces particularly popular for dog exercise and junior sports (e.g. at Troy Park).

Historically, the area was used for landfill, which presents some challenges for revegetating shoreline areas. While large portions of the site will remain as grassed open space, the Attadale-Alfred Cove Masterplan (Element, 2021) has identified the need to expand the vegetation buffer landward as part of a climate adaptation strategy.

Given strong local opposition to tree planting in the open areas of the park, initial revegetation efforts will focus on establishing sedgelands and low shrublands within a 30-metre buffer from existing sedges, with isolated trees planted only where they do not impact key views. The recreation of woodland habitats is planned for Troy Park and Point Waylen.

ENVIRONMENTAL VALUES

- Conservation significant saltmarsh community
- Marine park
- Migratory birds/bird habitat
- Remnant Freshwater Paperbark and Marri trees

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- Aboriginal Cultural Heritage (ACH) Historic Place 4104 Bourke Drive and 4105 Warragoon Crescent – Artefacts / Scatter

SOCIAL VALUES

- High passive recreational value, very popular for bird watchers (Alfred Cove in particular), forming MBS
- Long term volunteer activities by SERAG
- Off-leash dog area within Attadale foreshore.
- Sporting field at Troy Park

KEY THREATS

- Erosion
- Sea level rise / climate change
- Landfill exposure
- Vegetation loss due to trampling
- Tree vandalism
- Weeds

Table 19. Key Management Actions for Marradungup – Attadale Reserve from Page Street to Alfred Cove

No.	Management Actions	Priority for Management	Budget Allocation
COM 4. MARRADUNGUP - ATTADALE RESERVE FROM PAGE STREET TO ALFRED COVE			
43	Maintain existing fencing whilst planning revegetation activities landward. Ensure the slope is graded as flat as possible and densely planted with sedges.	High	Capital Works Project
44	Start the process of weed removal (grasses between the bushland and the pathway and revegetate with native sedges and rushes.	High	Capital Works Project
45	Repair the existing boardwalk to maintain it in serviceable condition. Replace with a new boardwalk pending further investigations and approvals in line with the Attadale Alfred Cove Masterplan.	Medium	Capital Works Project
46	Conduct supplementary planting to increase sedge density.	High	Capital Works Project
47	Remove asphalt rubble and consider brushwall installation if erosion is ongoing. Install trees (Swamp Sheoak) at 10 m intervals, approx. 2 m from the existing eroded edge.	Medium	Capital Works Project
48	Conduct control of Couch and revegetate. Under prune trees to allow for sufficient sunlight for sedges to grow.	High	Capital Works Project
49	Move the pathway landward and revegetate between the pathway and the existing fence.	Low	Capital Works Project
50	Monitor and treat weeds around the drain.	Low	Maintenance
51	Extend revegetation landward in accordance with the masterplan suggestions. This includes individual or cluster tree plantings.	Medium	Capital Works Project
52	Maintain revegetated areas via weed control and watering as required.	High	Maintenance
53	Control weedy species within the drainage sump and revegetate with native species.	High	Maintenance
54	Retain and restore native bushland by expanding the existing patch onto the surrounding grassed landscape.	High	Maintenance
55	Control Couch and revegetate densely with sedges.	Medium	Maintenance
56	Remediate eroding slope to remove coarse rubble and regrade to a more stable slope 1:4 and flatter where possible. Revegetate with sedges and trees, approximately 5 - 10 m apart.	High	Capital Works Project

No.	Management Actions	Priority for Management	Budget Allocation
COM 4. MARRADUNGUP - ATTADALE RESERVE FROM PAGE STREET TO ALFRED COVE			
57	Control weeds and revegetate as per DBCA Point Waylen Foreshore restoration plan and CoM plans for the foreshore with reference to AACMP.	High	Capital Works Project
58	Control weeds and expand the revegetation buffer.	High	Capital Works Project
59	Monitor and control *Typha* to reduce spread beyond the current extent. Revegetate any controlled areas with *Machaerina juncea* and or *J. kraussii.*	Medium	Maintenance
60	Cut and control *Casuarina glauca*. Remove juvenile growth regularly and plan for large tree removal with DBCA.	Low	Maintenance
61	Consider the replacement of turf with native sedges and herbs around the grass tree.	Low	Maintenance
62	Replace grass with native vegetation. Conduct weed control at the edge of the PSP to facilitate sedge growth. Use chunky mulch if required to suppress weeds.	Low	Maintenance
63	Remove excess leaf litter adjacent to the path to reduce fire hazard.	Medium	Maintenance
64	Monitor and control weeds surrounding the drainage outlet. Monitor erosion and revegetate with native sedges like *Machaerina juncea* .	Medium	Maintenance
65	Repair reserve access gate and fencing.	Medium	Maintenance
66	Control weeds and revegetate with *Juncus kraussii*.	Low	Maintenance
67	Monitor and start replacing with *Machaerina juncea* and *J. kraussii* if *Typha* regrowth is poor. Slash and remove dry biomass every 5 years from within 10 m of the fence (allow for regrowth).	Medium	Capital Works Project
68	Manage *Typha* to reduce fire hazard and replace any patches that are dying (e.g. not regrowing over two years) with *J. kraussii* and *M. juncea*.	Medium	Capital Works Project
69	Move the pathway away from the river's edge. Regrade and revegetate the river bank.	Low	Capital Works Project

It should be noted that the foreshore along Attadale Reserve from Page Street to Alfred Cove is managed by DBCA. Actions will be delivered in partnership or with the approval of DBCA.

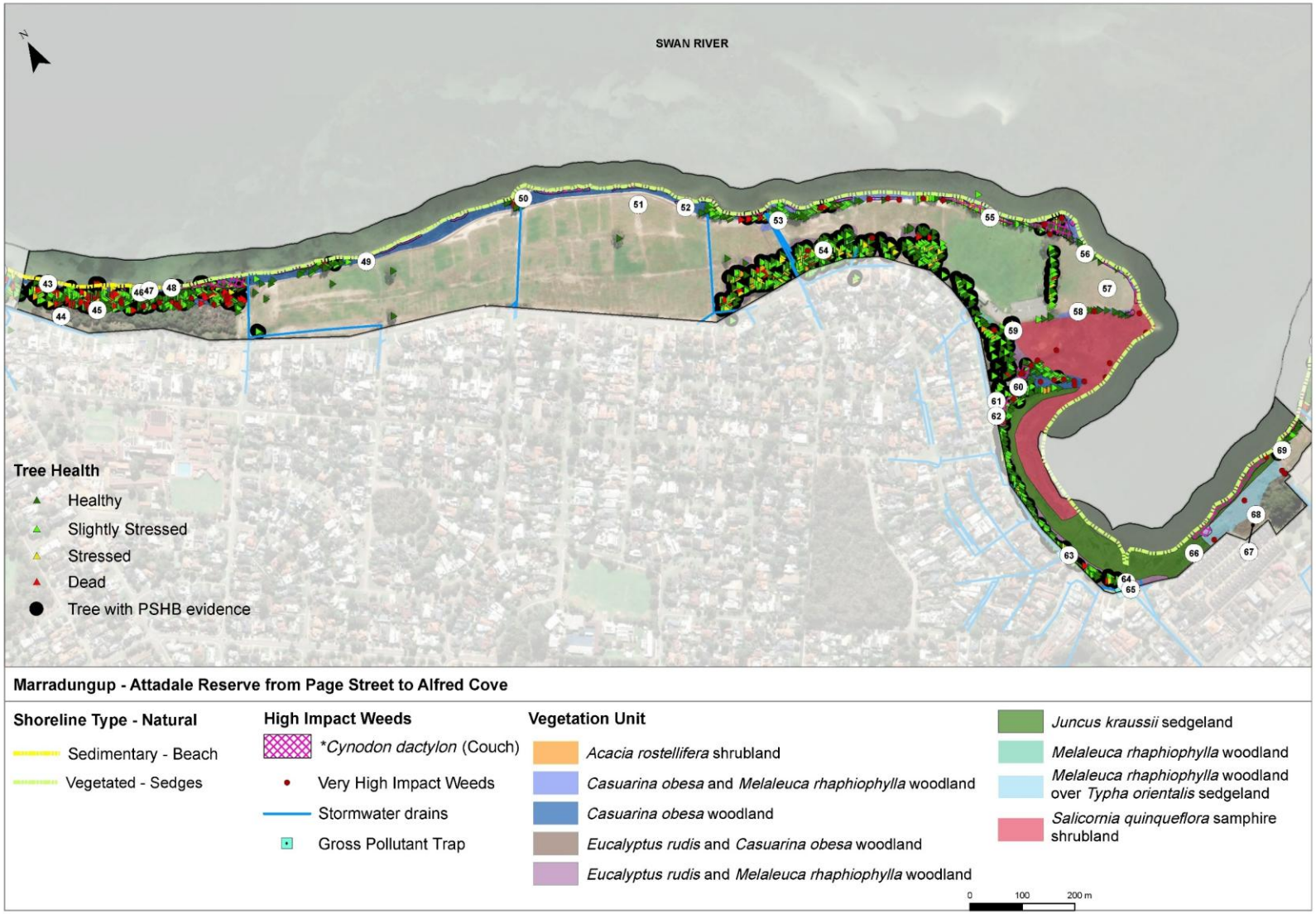


Figure 42. Marradungup – Attadale Reserve from Page Street to Alfred Cove key management action sites

COM 5: MARGAMANGUP - TOMPKINS PARK

KEY FEATURES

Tompkins Park is a prominent foreshore reserve within the City of Melville, featuring extensive grassed open space and is a key site for organised sport (cricket and soccer in particular) and community recreation.

The park borders the Swan River Marine Park and lies adjacent to Bush Forever sites, contributing to the ecological value of the foreshore. While much of the site will remain as recreational open space, opportunities exist to strengthen the vegetation buffer and improve habitat connectivity through targeted revegetation, particularly along the river's edge. A local landcare group SERAG has completed and continues to work on improving riparian buffer in the area.

Future planting will prioritise low-lying native vegetation that complements recreational use and maintains key sightlines and open space functionality

ENVIRONMENTAL VALUES

- Bird habitat
- Freshwater seeps supporting a more diverse riparian species assemblage.
- Shade trees at the northern end of the site and relatively well vegetated

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536

SOCIAL VALUES

- High active recreational value including cricket and soccer
- Amenity (club rooms, café) playground toilets)

KEY THREATS

- Weeds
- Erosion
- Landfill exposure

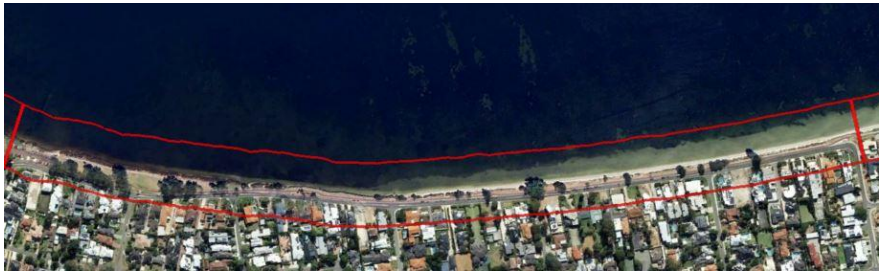
Table 20. Key Management Actions for Marradungup – Tompkins Park

No.	Management Actions	Priority for Management	Budget Allocation
COM 5. MARGAMANGUP - TOMPKINS PARK			
70	Control the regrowth of Giant Reed and maintain and supplementary plant bare areas of the foreshore.	High	Maintenance
71	Ensure dense planting of *J. kraussii* and *M. juncea* (this is a groundwater seep area). Control weeds.	High	Maintenance
72	Maintain existing vegetation to reduce the possibility of weed infestation.	High	Maintenance
73	Extend sedge planting from the existing to the pathway. Consider local heritage significance when planning works in the area.	Medium	Maintenance
74	Check and repair cracks in the headwall mortar. Monitor for erosion around the headwall and revegetate as required.	Low	Maintenance

Eroded areas are steep and will require long term management. Movement of the pathway landward to accommodate wider vegetation buffer with gentler slope is recommended.

Figure 43. Marradungup – Tompkins Park key management action sites

COM 6: MARGAMANGUP - MELVILLE BEACH ROAD



KEY FEATURES

The Melville Beach Road Foreshore is a narrow reserve that offers a scenic corridor for walking, cycling, and passive recreation, with expansive views across the river to the city. Due to strong prevailing winds, it is also a popular location for kiteboarding and windsurfing.

Despite its limited width, the foreshore forms part of the Bush Forever and Swan River Marine Park network, supporting fragmented pockets of native vegetation and providing valuable habitat for local birdlife.

Recent revegetation efforts have applied bioengineering techniques to improve foreshore stability and biodiversity, using low-profile plantings that preserve key views while supporting recreational use. However, as much of the vegetation is still in the establishment phase, the area remains vulnerable to erosion.

The site is also heavily infested with couch grass (**Cynodon dactylon*), requiring ongoing and intensive weed management using both selective and non-selective herbicides

ENVIRONMENTAL VALUES

- Ecological connectivity – contribution to nearby Bush Forever sites and the regional biodiversity linkages
- Buffering strong wave action.
- Community awareness and education on bioengineering.

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- German Jetty (Former) site (AP11) near Cunningham St. Melville Beach Applecross – Municipal Inventory

SOCIAL VALUES

- High active recreational value for kite and windsurfers

KEY THREATS

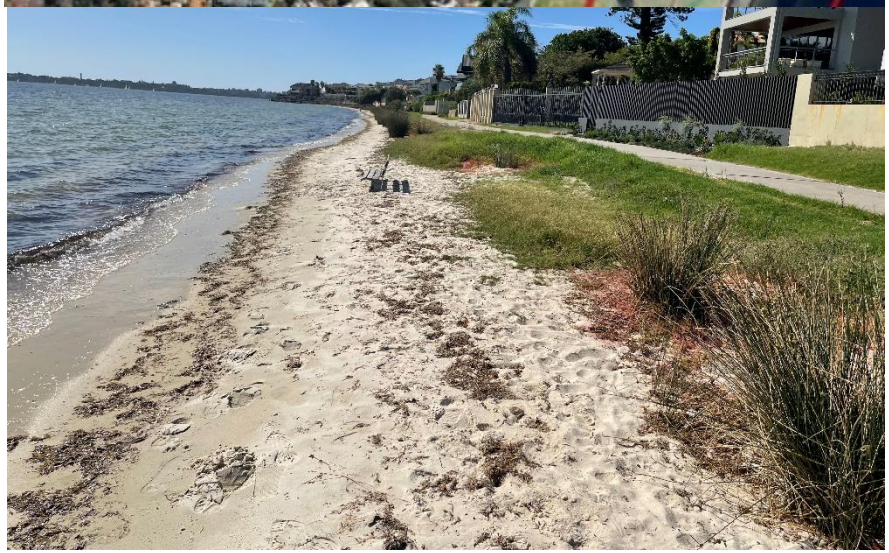
- Weeds
- Erosion
- Trampling of vegetation by informal access to the beach

Table 21. Key Management Actions for Margamangup - Melville Beach Road

No.	Management Actions	Priority for Management	Budget Allocation
COM 6. MARGAMANGUP - MELVILLE BEACH ROAD			
75	Damaged area of revetment to be re-patched. See P17 note in MP Rogers 2024 report.	Medium	Maintenance
76	Move pathway away from the shoreline and revegetate with sedges (*J. kraussii*).	Low	Capital Works Project
77	Remove grass and extend revegetation with sedges to the path.	Medium	Maintenance
78	Remove two Canary palm juvenile plants and revegetate with *J. kraussii*.	High	Maintenance
79	Monitor erosion and revegetate with large *J. kraussii* to reduce scour and maintain the existing *M. rhaphiophylla* tree.	Medium	Maintenance
80	Control weeds and revegetate the area between the wall and revetment with *J. kraussii*.	Medium	Maintenance
81	Use a selective herbicide to control turf grasses within vegetation.	High	Maintenance
82	Control Couch using the selective herbicide. Check overlaps on brushwall and fill in gaps as required. revegetate as per planting plans. Water the revegetated area during summer to ensure establishment. Tighten any loose logs and replace any broken wires.	High	Maintenance
83	Repair and replace any torn Coir mesh and revegetate.	High	Maintenance
84	Repair the bottom of the stairs and revetment and revegetate in front with large sedges of *J. kraussii*.	Medium	Maintenance
85	Control weeds and revegetate with large sedges of *J. kraussii, F. nodosa* and *C. gymnocaulos*.	High	Maintenance
86	Inspect the existing mortared revetment for damage and/or cracks and repair as needed.	Medium	Maintenance
87	Maintain safe access to the stairs (remove weeds).	High	Maintenance
88	Monitor erosion around the headwall and repair as required.	Medium	Maintenance
89	Monitor the gabion and repair as required. Utilise photo monitoring to check the stability of the existing lean. Plan for repair.	Medium	Maintenance

Figure 44. Margamangup - Melville Beach Road key management action sites

COM 7: MOONDAAP - MAJESTIC COVE AND POINT DUNDAS



KEY FEATURES

Majestic Cove and Point Dundas form a small foreshore area valued for passive and active recreation and expansive river views.

The foreshore contains scattered native vegetation that contributes to ecological connectivity. However, historic vegetation clearing and pressure from adjacent residential development have led to widespread weed infestation. While the area is narrow in places, it offers opportunities for targeted revegetation and erosion control, with some restoration works undertaken since 2019.

Future management should prioritise weed control and the planting of low-profile native species, particularly *Juncus kraussii* rushes, to improve habitat value and stabilise the shoreline. These works should be coordinated with pathway upgrades to maximise efficiency and reduce overall project costs.

ENVIRONMENTAL VALUES

- Ecological connectivity – contribution to regional biodiversity linkages via revegetated areas of the foreshore

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- Point Dundas, Majestic Hotel Site Boardwalk and Applecross Jetty (AP02) – Municipal Inventory, Town Planning Scheme.

SOCIAL VALUES

- High recreational value for kite and windsurfers
- High value for passive recreation (walking)

KEY THREATS

- Weeds
- Erosion
- Trampling of vegetation by informal access to the beach

Table 22. Key Management Actions for Moondaap - Majestic Cove and Point Dundas

No.	Management Actions	Priority for Management	Budget Allocation
COM 7. MOONDAAP - MAJESTIC COVE AND POINT DUNDAS			
90	Control weeds, regrade and revegetate. Ensure large stock is available for installation riverward. Ensure any earthworks required are conducted at the same time as the PSP upgrade. Install the pathway as far landward as possible.	High	Capital Works Project
91	Maintain the grassed area for beach access.	High	Maintenance
92	Repair damaged top blocks and re-mortar joints.	Low	Maintenance
93	Install additional *M. cuticularis*.	Medium	Maintenance
94	Inspect rock revetment and mortared slope biannually for cracks and damage and repair.	High	Maintenance
95	Maintain the jetty in a serviceable condition. Inspect as per schedule every 5 years unless significant deterioration or damage is noted.	High	Maintenance
96	Monitor and repack revetment to maintain function.	Medium	Maintenance
97	Renourish and redistribute existing sand as required.	Low	Maintenance
98	Maintain existing sedges.	High	Maintenance

Please note: Action 94 is for an asset that is privately owned and is not maintained by the City.

Figure 45. Moondaap - Majestic Cove and Point Dundas key management action sites

COM 8: KOOYAGOORDUP - JEFF JOSEPH AND THE STRAND

KEY FEATURES

Jeff Joseph Reserve and The Strand are significant foreshore areas within Bush Forever Site 331, providing vital habitat and biodiversity linkages along the Swan River.

Under the guidance of the City's Natural Areas Asset Management Plan, restoration efforts focus on foreshore stabilisation and native revegetation to enhance ecological connectivity. The reserve also supports high community use, with upgraded shared paths, expansive grassed areas, and panoramic river views making it a popular location for walking, dog exercise, and local events.

The Jeff Joseph Reserve is low-lying and prone to inundation and erosion. As such, a key management action is the landward expansion of the vegetation buffer, as riverward revegetation and shoreline reclamation are unlikely to succeed and are not consistent with long-term climate adaptation strategies.

ENVIRONMENTAL VALUES

- Vegetated riparian buffer,
- Shade trees
- Bird habitat

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536

SOCIAL VALUES

- High passive recreational value.
- Sports - City's grassed Tennis areas, fishing and water sports
- Cycling
- Group activities / events like birthday parties or similar.

KEY THREATS

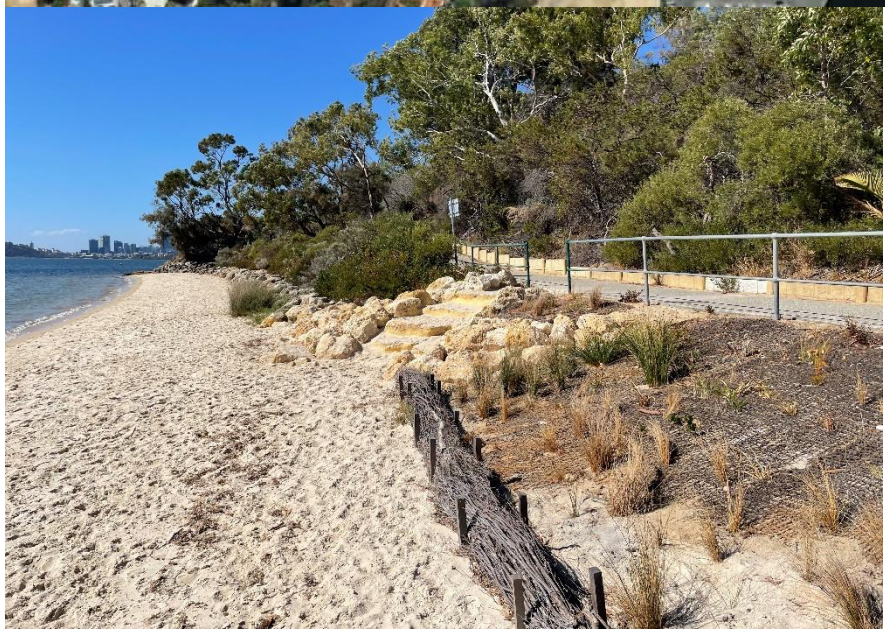
- Weeds
- Erosion
- Trampling of vegetation by informal access to the beach

Table 23. Key Management Actions for Kooyagoordup - Jeff Joseph and The Strand

No.	Management Actions	Priority for Management	Budget Allocation
COM 8. KOOYAGOORDUP - JEFF JOSEPH AND THE STRAND			
99	Regrade to remove turf and revegetate.	High	Capital Works Project
100	Maintain beach access.	High	Maintenance
101	Plan planting of advanced trees for the parkland areas - plan in a way that does not obstruct views to reduce the possibility of vandalism.	Medium	Capital Works Project
102	Remove turf between the pathway and the existing vegetation and revegetate with sedges, shrubs (low) and trees (all the way past tennis courts).	High	Capital Works Project
103	Baffles have minimal function only. Consider removal.	Low	Maintenance
104	Consider revegetation with mature sedges and low brushwall to help retain sand.	Medium	Maintenance
105	Remove exotic tree saplings and juveniles.	High	Maintenance
106	Remove Canary Palm	High	Maintenance
107	Revegetate gaps in sedges to provide continuous protection to the shoreline and reduce weed incursion.	High	Maintenance
108	Maintain access to the bubble-up pit.	High	Maintenance
109	Regularly inspect GSCs and repair as required.	Medium	Maintenance
110	Plan for revegetation of the area. Consult with the Tennis Club and the adjacent residents. Include a cluster of trees.	Low	Capital Works Project
111	Widen sedge area and plan for regular informal access to the beach.	High	Maintenance
112	Collect *Sporobolus virginicus* (Marine Couch) seed and propagate for use in the local areas instead of turf.	Medium	Maintenance
113	Remove turf and revegetate the area between the drain and the Scout hall. Ensure follow up weed control for Sea Spinach and Couch.	Low	Capital Works Project

Figure 46. Kooyagoordup - Jeff Joseph and the Strand key management action sites

COM 9: GOOLUGATUP FORESHORE



KEY FEATURES

The Goolugatup Foreshore, adjacent to the Goolugatup Heathcote Cultural Precinct, offers scenic river views and is popular for walking and passive recreation. The precinct features an art gallery, artist studios, a restaurant, and a well-used playground.

Due to ongoing erosion pressure, much of the foreshore has been stabilised using bioengineered brush walls, rock revetments, reno mattresses, and revegetation. However, erosion remains a concern—particularly along the upper foreshore and the section adjacent to the South of Perth Yacht Club—and further measures are needed to ensure long-term stability.

To the south, the Goolugatup Lowerlands is being revitalised through works that include wetland restoration, native planting, weed control, and foreshore stabilisation.

ENVIRONMENTAL VALUES

- Remnant limestone shrublands and Tuart woodlands
- Limestone scarp
- Shade trees
- Bird habitat

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- Goolugatup Registered site 18632 (ceremonial, mythological)
- Goolugatup Registered site 3705 (camp ground)
- Pont Heathcote Lower Land (A22)

SOCIAL VALUES

- High active recreational value for kite and windsurfers.
- Dog Beach area.

KEY THREATS

- Weeds
  - Erosion
  - Trampling of vegetation by informal access.

Table 24. Key Management Actions for Goolugatup foreshore

No.	Management Actions	Priority for Management	Budget Allocation
COM 9. GOOLUGATUP FORESHORE			
114	Control Couch and revegetate. No marine couch in the area with a brushwall. Ensure plants are watered in the first summer to assist with establishment. Monitor and repair any brushwall damage.	High	Maintenance
115	Monitor and maintain revetment. Repack as required to ensure integrity.	Medium	Capital Works Project
116	Repair eroded scarp. Utilise erosion matting, brush palisades and tube stock. Check fencing. Remove weeds like Canary Palm on the lower slope.	Medium	Capital Works Project
117	Monitor, control weeds and revegetate to maintain an adequate and resilient setback to the path.	Medium	Capital Works Project
118	Repack and re-mortar exposed material (rocks) on the access stairs. Repack revetment. Monitor and repair any damage to the erosion control fabric.	Medium	Maintenance

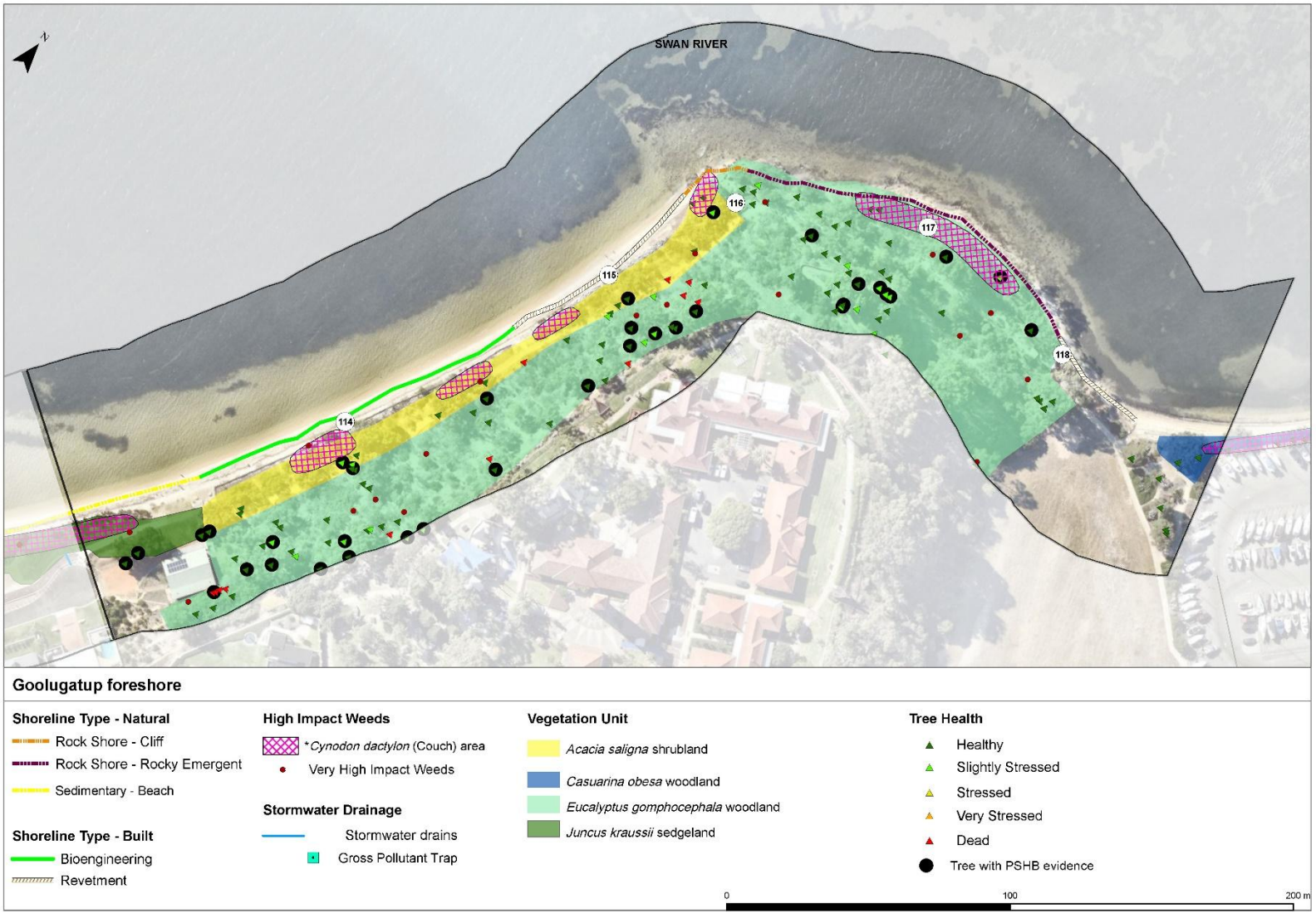


Figure 47. Goolugatup Foreshore key management action sites

COM 10: GABBI KOWANGULUP - COFFEE POINT AND CANNING BEACH ROAD

KEY FEATURES

Located near the South of Perth Yacht Club, the Coffee Point Foreshore provides scenic views and supports recreational activities such as walking, cycling, and birdwatching. A section of the foreshore adjacent to the rock revetment downstream has experienced significant erosion, influenced by the movement and berthing of vessels at the nearby jetty, thus requiring management.

The Canning Beach Road Foreshore is a narrow strip of green space with pockets of native vegetation. Though constrained in width, it forms part of the broader Swan–Canning River Park, supporting habitat connectivity and passive use. Weed control and view-sensitive planting are likely ongoing management priorities. However, more immediately, revetment repairs and reinstatement are required to the north and revegetation to the south to address losses of sedges opposite Riviere Residences.

ENVIRONMENTAL VALUES

- Remnant sedges and trees
- Shade trees
- Bird habitat

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- Raffles Hotel (AP09) – State register
- Coffee Point Boatyard slipway/wharf (former) (AP14) – Municipal Inventory
- Canning Bridge (AP20) - State Register

SOCIAL VALUES

- Passive and active recreation
- River views
- Bird habitat

KEY THREATS

- Erosion
- Weeds
- Trampling of vegetation by informal access to the beach
  - Recreational boating
  - Narrow nature of the reserve and high elevation of the river bank

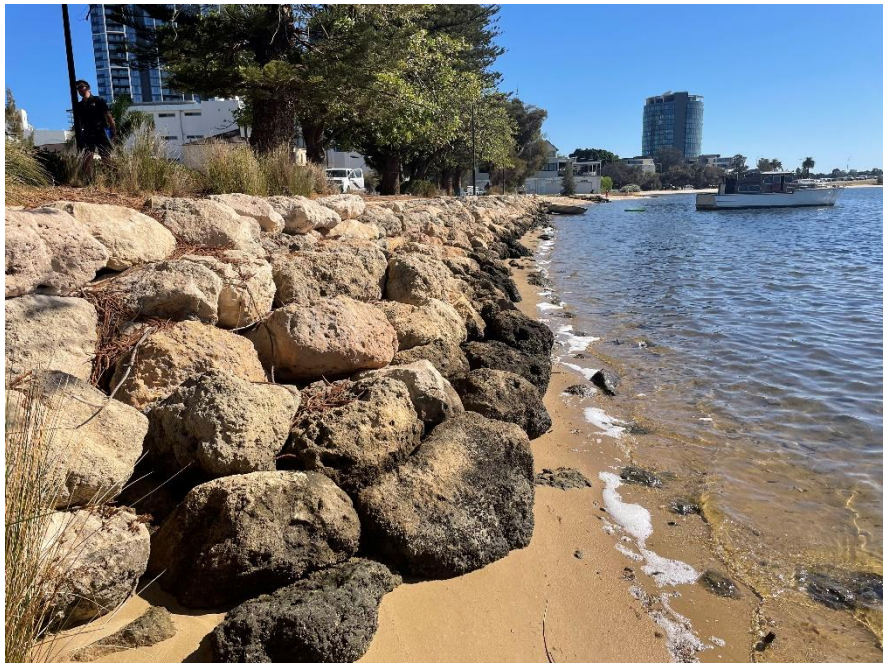
Table 25. Key Management Actions for Gabbi Kowangulup - Coffee Point and Canning Beach Road

No.	Management Actions	Priority for Management	Budget Allocation
COM 10. GABBI KOWANGULUP - COFFEE POINT AND CANNING BEACH ROAD			
119	Revegetate the area.	High	Maintenance
120	Infill planting.	High	Maintenance
121	Control weeds, remove turf between the path and vegetation and revegetate with sedges.	High	Capital Works Project
122	Manage erosion and revegetate up to the path.	High	Capital Works Project
123	Repack rocks, and extend revetment to tie into vegetation downstream.	High	Capital Works Project
124	Repack rocks to create a stable rock rip rap where gaps exist and around trees. Infill gaps with coarse sand and maintain turf. Plan for the refurbishment of the revetment to address gaps and instabilities – Major capital works – reconsider moving the pathway and narrowing the road.	High	Capital Works Project
125	Extend sedges to the path.	Medium	Maintenance
126	Prune back sedges in front of the outlet. Maintain.	High	Maintenance
127	Revegetate under Paperbarks with *M. juncea*.	High	Maintenance
128	Address the undermining of trees - install Brushwall or a similar product to tie into the existing sedges.	Medium	Maintenance
129	Clear vegetation (weeds and prune back sedges) in front of the stormwater outlet.	High	Maintenance
130	Remove grass and revegetate to the PSP.	Medium	Maintenance
131	Upgrade drainage.	Medium	Capital Works Project
132	Clear dead vegetation and revegetate with mature sedges. A dense planting is required, and no grass between the path and the sedges.	High	Maintenance
133	Maintain turf and a single access to the beach close downstream access.	High	Maintenance
134	Maintain turf. Monitor erosion and renourish losses. Tie in revetment into the slope at the upstream end and consider planting of mature sedges within the narrow strip.	Medium	Maintenance
135	Extend walling	Medium	Capital Works Project
136	Assess damage on piles 1A and 1B. Treat steel components, replace missing piles and treat timber decking.	Medium	Capital Works Project
137	Re-mortar joints and reinstate damaged blocks.	Low	Maintenance

Please note: Actions 132 & 133 will be delivered via a Development Application agreement

Figure 48. Gabbi Kowangulup - Coffee Point and Canning Beach Road key management action sites

COM 11: WAGOORJUP - THE ESPLANADE NORTH



KEY FEATURES

The foreshore south of Canning Bridge, including Apex Reserve, is a popular section of the Canning River corridor, used for walking, cycling, and passive recreation and water-based activities from Apex Reserve adjacent to Canning Bridge. It features shared paths, river views, and access to local amenities.
The foreshore has been modified with rock revetments and grassed embankments, with some remnant riparian vegetation remaining. Erosion control and weed management are ongoing priorities for the site.
Further south along The Esplanade, the foreshore narrows but retains pockets of native sedges and rushes as well as Paperbarks that support bank stability and habitat value. Revegetation and access management are needed where vegetation has been lost due to recreational pressure, and revetment repairs are conducted where damage to the existing vegetation has occurred. The entire shore is subject to climate change pressures and, as such, requires a long term solution approach.

ENVIRONMENTAL VALUES

- Shade trees
- Remnant vegetation
- River views

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- Swan River Rowing Clubhouse (MP02) – Municipal Inventory
- Rockwood Street Jetty (MP01) – Municipal Inventory

SOCIAL VALUES

- Variety of active and passive recreational opportunities

KEY THREATS

- Weeds
- Erosion
- Sea level rise
- Trampling of vegetation by informal access to the beach

Table 26. Key Management Actions for Wagoorjup - The Esplanade North

No.	Management Actions	Priority for Management	Budget Allocation
COM 11. WAGOORJUP - THE ESPLANADE NORTH			
138	Install new end-point control. Renourish, with ongoing replenishment.	Low	Maintenance
139	Control weeds and revegetate with *F. nodosa*.	High	Maintenance
140	Plan for revegetation incorporating salt tolerant species like *Suaeda australis*. Underprune Sheoaks to facilitate understory establishment. Revegetate to path.	Medium	Maintenance
141	Remove woody weeds from the garden bed.	Medium	Maintenance
142	Mitigate erosion adjacent to the wall. May require renourishment, GSCs and or revetment tie-in.	High	Maintenance
143	Renourish	Low	Maintenance
144	Monitor erosion. Renourish as required.	Low	Maintenance
145	Re-mortar and repack stone around headwall.	Low	Maintenance
146	Fix erosion and undercutting by installing brushwall with a rock toe, and or tie in to existing revetment and gabion cages. Plan for capital works.	High	Capital Works Project
147	Consider Infill.	Medium	Maintenance
148	Backfill, pack and mortar rocks to fill gap under gabion. Consider placement of scour protection in front of gabions. Remove degraded rubber dinghy.	Medium	Capital Works Project
149	Backfill, pack and mortar rocks to fill gaps under gabion. Consider placement of scour protection in front of gabions.	Medium	Capital Works Project
150	Consider revegetation to the pathway (remove grass) to the access stairs (south).	Medium	Maintenance
151	Fix rock rip rap to prevent further erosion.	Medium	Capital Works Project
152	Infill Planting with mature (140mm pot) J. kraussii. Repack existing rock protection south of this area.	Medium	Maintenance
153	Regrade and revegetate to the path with sedges.	Medium	Maintenance

No.	Management Actions	Priority for Management	Budget Allocation
COM 11. WAGOORJUP - THE ESPLANADE NORTH			
154	Remove dead tree branches. Install brushwall to tie into existing sedges. Renourish with sand and revegetate the eroding bank. Path dips in the area - fix path.	High	Capital Works Project
155	Monitor the condition of the gabion annually.	High	Maintenance
156	Renourish with sand and install brushwall or repack rocks where present. Plan for the restoration of this area as erosion is too close to the path.	High	Capital Works Project
157	Repack rocks where present. Revegetate with sedges to the path where space available. Plan for the restoration of this area.	High	Capital Works Project
158	Prune Myoporum, Maintain access.	High	Maintenance
159	Close (temporary fence) access and direct to the north. Revegetate with sedges.	Medium	Maintenance
160	Clean up graffiti. Reinstate the missing stringer end cap. repack scour protection under the abutment. Minor paint touch-up on the handrail.	Medium	Maintenance
161	Repack rocks around the drain outlet. Plan for the replacement/upgrade of the drain.	Medium	Capital Works Project
162	Path reinforcement & infill planting	Medium	Maintenance
163	Remove grass and revegetate with *Juncus* and fill in gaps within existing sedges.	Medium	Maintenance
164	Repack rocks especially close to light pole. Revegetate with sedges. The plan for restoration may need to increase the rock crest height to the path level.	High	Capital Works Project
165	Revegetate the upper embankment with *M. juncea*.	Medium	Maintenance
166	Progressively remove turf and allow sedges to spread. Alternatively, remove altogether and revegetate with *M. juncea* (more climate resilient).	Medium	Maintenance
167	Repack rock revetment. Revegetate the path with sedges.	Medium	Capital Works Project
168	Old drain. check for function and replace as part of Capex works.	Medium	Capital Works Project
169	Close out the gap in riparian edge by planting large bags of *Juncus kraussii*. Remove grass from the path and revegetate with *M. juncea*.	Medium	Maintenance
170	Revegetate with sedges to the path and the beach access.	High	Maintenance

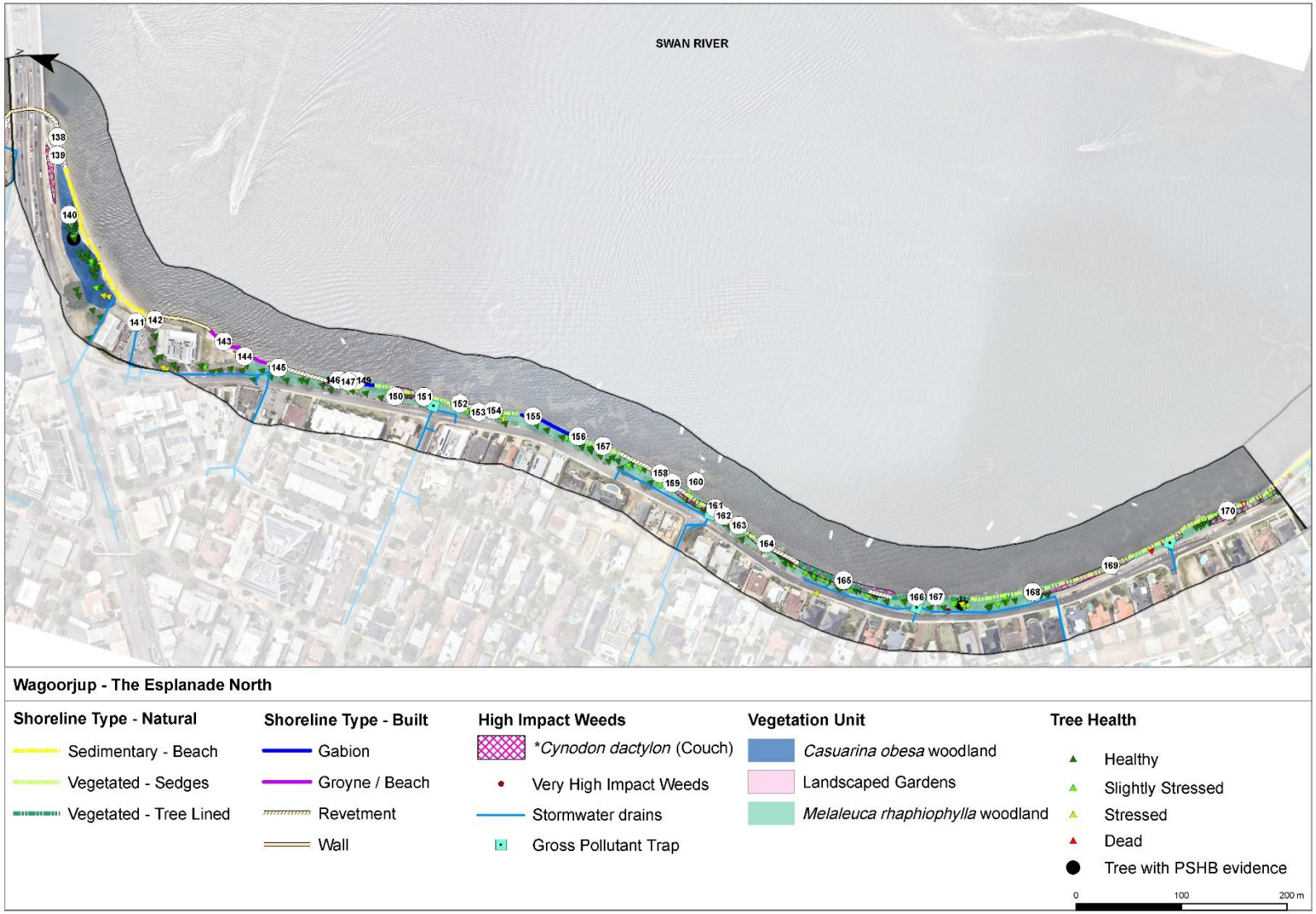


Figure 49. Wagoorjup - The Esplanade North key management action sites

COM 12: WAGOORJUP – DEEP WATER POINT

KEY FEATURES

Deep Water Point Reserve, located on the Canning River in Mount Pleasant, is one of the City's most popular foreshore destinations supporting a wide range of recreational activities. The reserve features grassed open space, a children's playground, jetty, boat ramp, and café, with accessible amenities. A shared path runs through the site, linking to the broader river trail network, and a large, timed carpark accommodates car and boat trailer parking.

While largely formalised, the foreshore includes areas of sandy shoreline and riparian vegetation, which require management and maintenance to balance ecological and recreational values.

ENVIRONMENTAL VALUES

- Shade trees
- Bird habitat
- Some remnant sedges and trees

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- Deep Water Point Reserve including Jetty and Sculpture Park (MP04) – Municipal Inventory

SOCIAL VALUES

- High water sport usage
  Café and associated passive recreation amenities

KEY THREATS

- Weeds
- Erosion
- Trampling of vegetation by informal access to the beach

Table 27. Key Management Actions for Wagoorjup – Deep Water Point

No.	Management Actions	Priority for Management	Budget Allocation
COM 12. WAGOORJUP – DEEP WATER POINT			
171	Revegetate with sedges to the path.	Low	Maintenance
172	Keep the boundary between turf and native marine couch as clear as possible. Consider a native sedge bed or similar.	High	Maintenance
173	Apply corrosion-inhibiting grease to structural fixings. Clean marine growth on the piles.	High	Maintenance
174	Repaint corroded areas. Restore ladder handle. Confirm cathodic protection testing on piles 1 – 4. Consideration of flat bars to secure fenders.	High	Maintenance
175	Widen the sedge buffer strategically whilst maintaining wide access to the beach.	Medium	Maintenance
176	Revegetate with native species and consider tree planting in clusters of 2-3.	Low	Maintenance
177	Revegetate with sedges and trees.	Low	Maintenance
178	Maintain access.	High	Maintenance

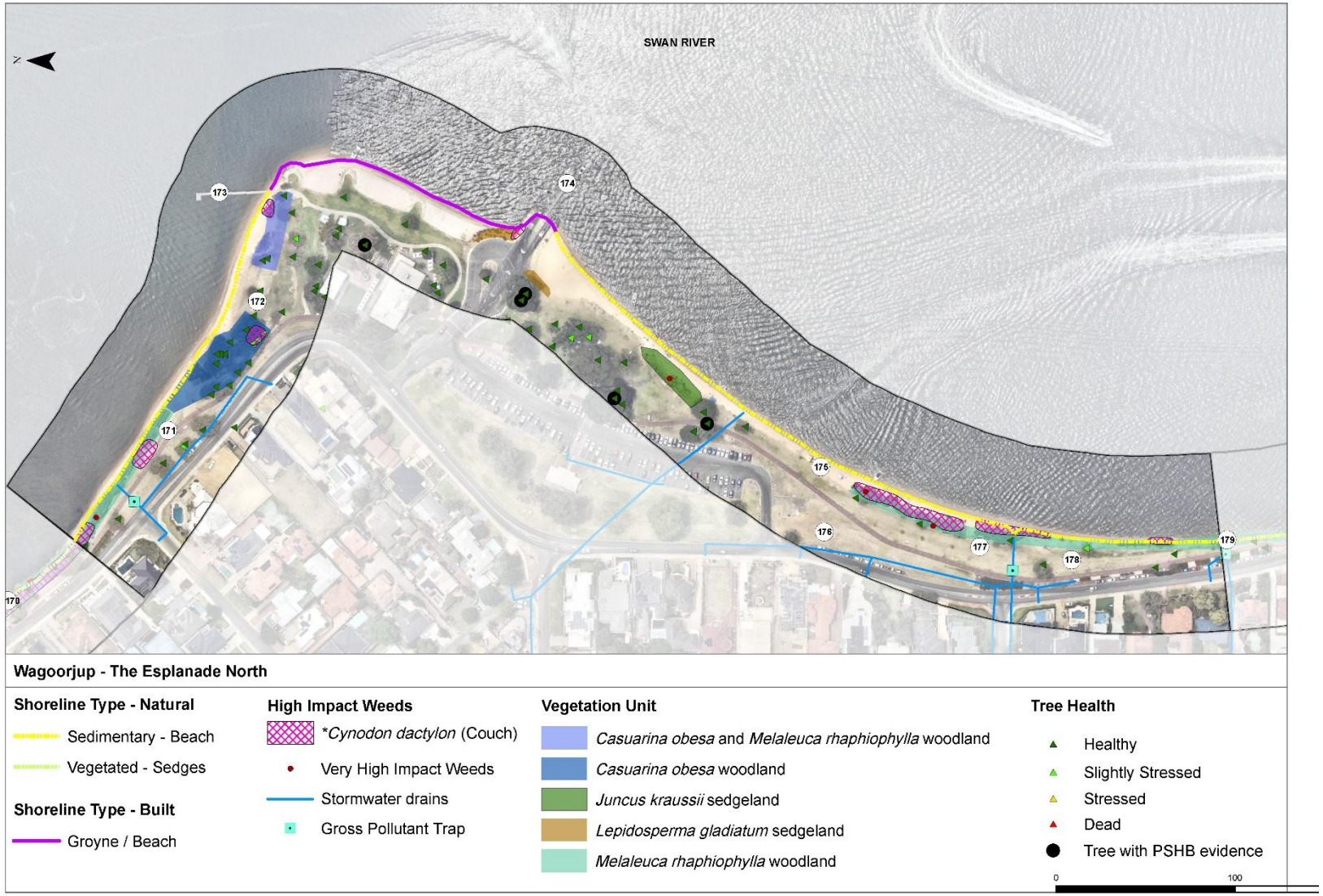


Figure 50. Wagoorjup – Deep Water Point key management action sites

COM 13: WAGOORJUP - THE ESPLANADE SOUTH

KEY FEATURES

The Esplanade Foreshore South, is a valued section of the Canning River corridor, supporting walking, cycling, and passive recreation along a continuous shared path.

Although the foreshore contains areas of riparian vegetation, it is constrained in width and subject to several pressures. These include erosion, weed invasion, and loss of native sedges and rushes due to informal access . In parts, the narrowness of the shoreline is such that it threatens damage to the pathways and amenities (such as lighting), emphasising the need for improved access management.

The site is part of the City's Long-Term Cycle Network, with future upgrades aiming to improve connectivity while restoring ecological values through targeted revegetation and stabilisation works.

ENVIRONMENTAL VALUES

- Shade trees
- Bird habitat
- Remnant vegetation

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536

SOCIAL VALUES

- Variety of passive and active recreational activities available
- Parking along the road
  Mobile Café at Mount Henry Bridge

KEY THREATS

- Weeds
- Erosion
- Trampling of vegetation by informal access to the beach

Table 28. Key Management Actions for Wagoorjup - The Esplanade South

No.	Management Actions	Priority for Management	Budget Allocation
COM 13. WAGOORJUP - THE ESPLANADE SOUTH			
179	Revegetate with large sedges on either side of the drainage outlet.	Medium	Maintenance
180	Restore the area in accordance with the restoration plan (in preparation).	High	Capital Works Project
181	Repack rocks around drainage pipe outlets.	Medium	Maintenance
182	Selective weed control of grasses and revegetate to pathway.	High	Maintenance
183	Revegetate the gap in existing sedges.	High	Maintenance
184	Fix potholes (safety).	High	Maintenance
185	Prune back *Juncus* growing at the drainage pipe and or transplant on either side of the headwall.	High	Maintenance
186	Monitor revetment and patch any gaps.	Medium	Maintenance
187	Repack rocks at the abutment of the jetty.	High	Capital Works Project
188	Replace pile timber connection plates. Repair pile encapsulation. Treat steel components. Denso wrap steel pile.	High	Capital Works Project
189	Rebuild the revetment next to the drain	Medium	Capital Works Project
190	Revegetate with sedges.	High	Maintenance
191	Fix the revetment connection.	Medium	Capital Works Project
192	Repair eroded timber wall. Prepare a restoration plan for the area. Renourishment and GSCs could be used in the interim if urgent works are required.	High	Capital Works Project
193	Revegetate the path with sedges.	Medium	Maintenance
194	Keep access.	High	Maintenance
195	Revegetate to path.	Medium	Maintenance
196	Remove Gazania and plant native species.	Medium	Maintenance
197	Marri Woodland - plant Marri as a parkland tree of choice.	Medium	Maintenance
198	Reattach exposed wires. Secure loose handrail. repair damage to the light post, repaint where paint loss occurs. Monitor.	High	Maintenance
199	Trial seasonal renourishment.	Medium	Maintenance
200	Monitor for wall undermining and any damage to GSCs.	High	Maintenance
201	Remove broken pipe pieces. Regrade and revegetate to path. Temporarily fence off to minimise access (access close by under the bridge)	Medium	Capital Works Project

No.	Management Actions	Priority for Management	Budget Allocation
COM 13. WAGOORJUP - THE ESPLANADE SOUTH			
202	Use brushwall or similar to help establish vegetation. Regrade and revegetate to path.	Medium	Capital Works Project
203	Start brushwall here, regrade and revegetate to 204.	Medium	Capital Works Project
204	End of brushwall and revegetation from 203. Tie in with existing vegetation and revegetate the path.	Medium	Capital Works Project
205	Keep access. Local treatment at the Regent Way drain	High	Maintenance
206	Repack rocks, especially where erosion is close to the path.	High	Capital Works Project
207	Local tree protection. Fix pitching at the benches.	High	Capital Works Project
208	Address erosion between 189 and here - seek the coastal engineer's opinion on the use of a brushwall. In the interim, renourish and repack rocks where available.	High	Capital Works Project
209	Revegetate the path with sedges.	Medium	Maintenance
210	Fix mortar at the access - reinforce the eroded gap with sand.	Medium	Maintenance
211	Revegetate the bare gap with *Ficinia nodosa* along the path	High	Maintenance
212	Fix broken pipe and revegetate surrounds with sedges. May require under-pruning of trees and a brushwall or similar to protect vegetation during establishment.	Medium	Maintenance
213	Ensure the lower embankment is well vegetated with sedges. Ensure adequate light can reach sedges - remove dead trees and shrubs.	High	Maintenance
214	Revegetate around the drainage outlet, including the upland area. Irrigate the upland to ensure successful establishment.	Medium	Maintenance

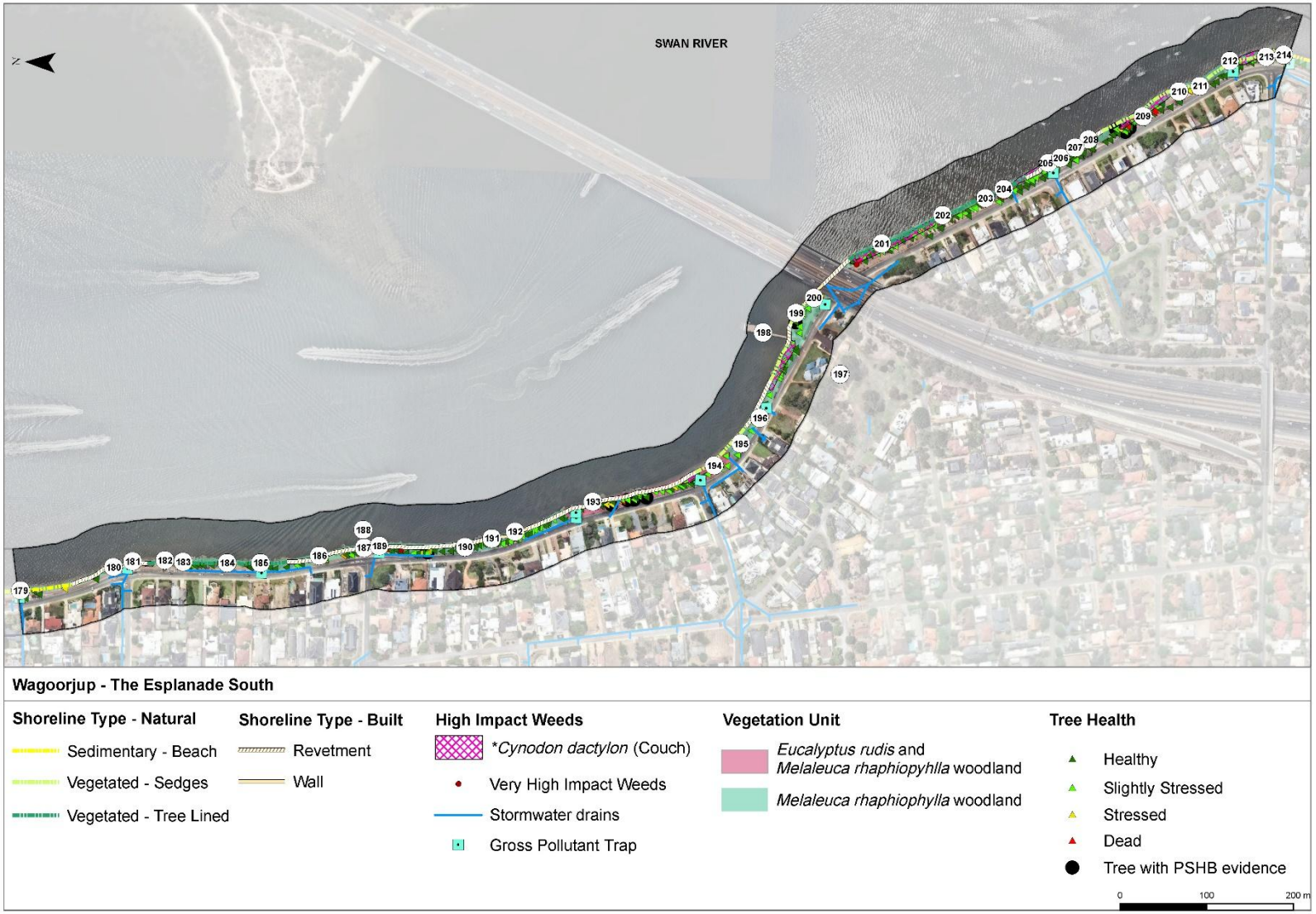


Figure 51. Wagoorjup - The Esplanade South key management action sites

COM 14: GABBILJEE- THOMAS MIDDLETON THROUGH TO BATEMAN PARK

KEY FEATURES

The foreshore between Thomas Middleton Park and Bateman Park is a peaceful riverside corridor valued for its native vegetation, riverine habitats, and cultural significance. It features fringing sedgelands, along with flooded gum and paperbark thickets, with vegetation condition ranging from degraded to very good.

The area holds significant Noongar cultural value, and ongoing efforts are focused on habitat restoration, weed management, and access control to protect both ecological and cultural values. While some areas have been impacted by weeds and informal tracks, current restoration actions aim to improve biodiversity, shoreline stability, and community awareness.

ENVIRONMENTAL VALUES

- Remnant Melaleuca and Flooded Gum woodlands and Juncus sedgelands
- Shade trees
- Bird habitat

HERITAGE VALUES

- Swan River - Registered Aboriginal Heritage Site 3536
- Bull Creek ACH Historic Place 3299 (artefacts / scatter)

SOCIAL VALUES

- Key pathways offer opportunities for passive and active recreation
- Shade trees
-

KEY THREATS

- Weeds
- Erosion
- Trampling of vegetation by informal access to the beach

Table 29. Gabbiljee- Thomas Middleton Through To Bateman Park key management actions

No.	Management Actions	Priority for Management	Budget Allocation
COM 14. GABBILJEE- THOMAS MIDDLETON THROUGH TO BATEMAN PARK			
215	Maintain weed control and ensure sedges spread to close gaps between them. Consider planting a cluster of Marri trees in the upland area.	High	Maintenance
216	Maintain grassy weed cover to protect banks and prepare a restoration plan for the area.	Medium	Capital Works Program
217	Revegetate areas where weed control was completed. Continue progressive weed control.	High	Maintenance
218	Transplant *Juncus* growing within the pipe outlet to the side of the pipe.	High	Maintenance
219	Conduct control of Giant Reed and revegetate.	High	Maintenance
220	Maintain weed control to reduce further spread.	High	Maintenance
221	Deteriorated decking to be replaced. Apply corrosion-inhibiting grease to fixings.	Medium	Maintenance
222	Replace dead *Lomandra longifolia* with native sedges.	High	Maintenance
223	Maintain vegetation around the *River Journeys* space in good condition. Replace dead *Lomandra longifolia* with native to the site species.	High	Maintenance
224	Investigate opportunities for revegetation. Remove large *Tamarix* once revegetation is confirmed.	Low	Maintenance
225	Maintain weed control and revegetation efforts.	High	Maintenance
226	Repair and or reinstate the pathway damaged by roots.	High	Maintenance

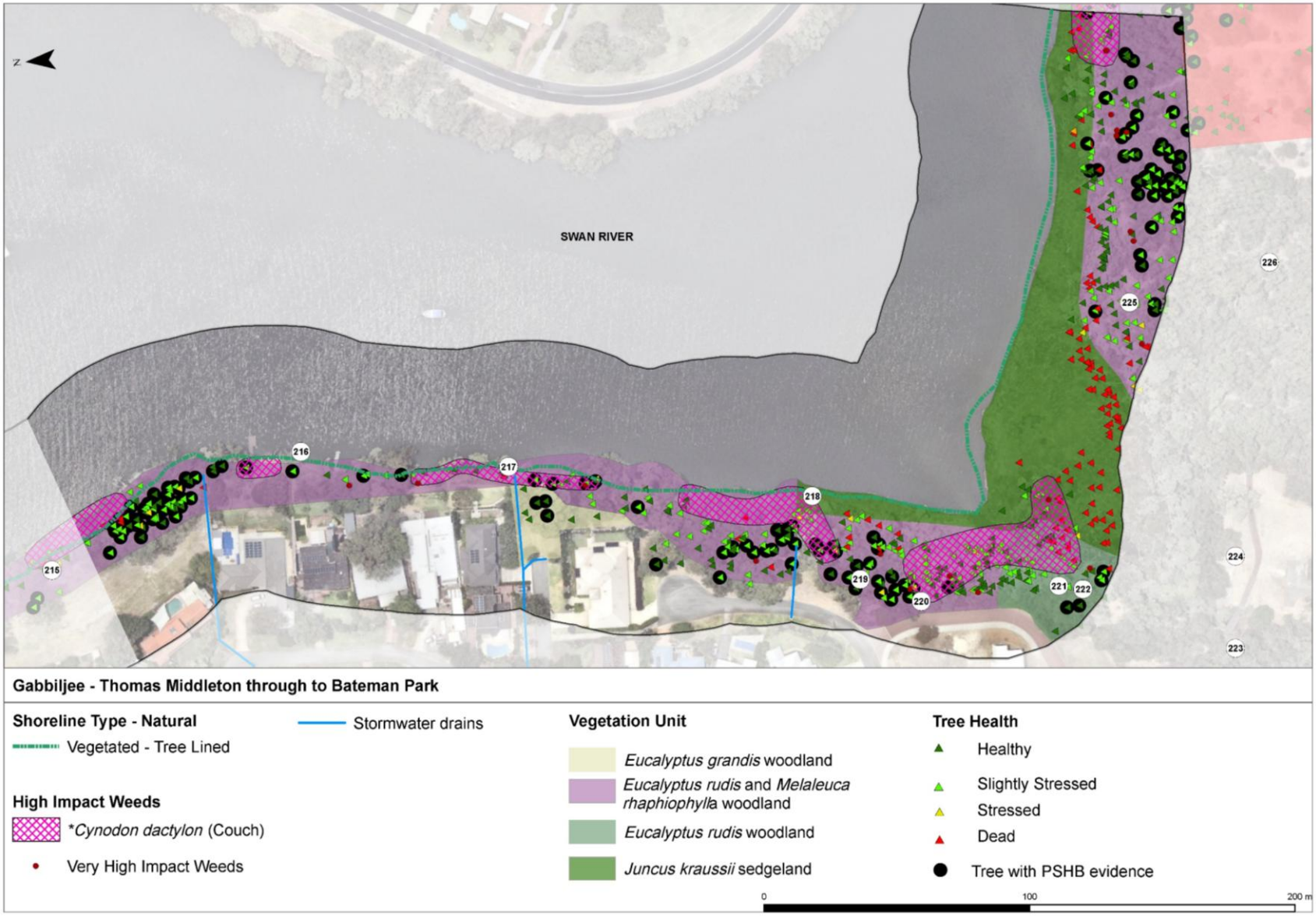


Figure 52. Gabbiljee - Thomas Middleton through to Bateman Park key management action sites

14.0 LONG-TERM STRATEGIC MANAGEMENT RECOMMENDATIONS

Management priorities require consideration of longer-term (10-30 year) strategies and should provide capacity to adapt foreshore management approaches where necessary. This is particularly important in areas where there is progressive erosion pressure (i.e. previous reclamation areas) and those locations where there is susceptibility to projected sea level rise (i.e. narrow riparian zones). Within the City of Melville, there is also important consideration where there are critical emerging thresholds, including erosion threats to roadways or exposure of landfill material.

Identified examples where long-term strategic management should be considered include Point Walter, Attadale foreshore and Canning River foreshore:

- Proliferation of foreshore protection works and ongoing erosion pressure at Point Walter conflict with its high public use. Rather than continuing to reinforce the existing protection, a strategic evaluation of the site is appropriate, supporting progressive restructuring that will support amenity under eroding conditions. Reclamation may be used as a partial offset.

- Attadale foreshore has transitioned towards increasing reliance on larger root mass plants (especially trees) to support foreshore stability. It is appropriate to ensure a species mix on the landward side that can provide riparian zone resilience under eroding conditions. Increasing the vegetation buffer width is also recommended in line with the AACMP.

- Roads and paths along most of its length mean that the Canning River foreshore has limited remaining space to be occupied by riparian vegetation, reducing its resilience. Without a change in management, revetments and walling will proliferate as the riparian zone gets further pinched. Opportunities for widening the riparian zone and manage retreat, including path and road relocation, regrading, inclusion of alongshore controls, and possibly some reclamation, should be considered and trialled. This will require coordination between the City state agencies (principally DBCA) and services and utilities providers (e.g. Water Corporation, Synergy etc). It is noted that the concept proposed by GHD (2019a) involved the construction of gabions riverward of the riparian zone to trap sediment (Point Walter) or as an alternative to rock rip rap (Canning Road). Further consideration needs to be made landward, not only riverward, wherever possible.

Melville foreshore has historically experienced limited inundation pressure. However, much of the reclaimed foreshore is relatively low, with exposure potentially occurring under severe present-day conditions, with increasing likelihood under projected sea level rise scenarios. Areas of particular interest include:

- The foreshore areas from Point Walter to Point Dundas, including most of the Attadale and Applecross foreshores, are reclaimed land. Currently, coastal hazards are mainly confined to vegetated zones and existing foreshore structures. However, the Applecross foreshore is more vulnerable to inundation due to increased exposure to higher wave conditions

- Infilled foreshore areas from Goolugatup to Gunbower Jetty, with present-day inundation hazard able to reach existing pathways and roads.

Through continued collaboration, innovation, and evidence-based evaluation, the City can ensure that future Foreshore Management Plans remain adaptive, forward-looking, and capable of sustaining both the ecological health and community value of its riverine environments for generations to come.

14.1 KEY RECOMMENDATIONS FOR FUTURE REVIEW AND IMPROVEMENT OF THE FORESHORE MANAGEMENT PLAN

Building on the long-term strategic priorities outlined in Section 14.0, future updates of the FMP should focus on strengthening the City's adaptive capacity and refining the evidence base for decision-making. The next revision of this Plan should build upon the lessons learned through implementation, monitoring and evaluation of on-ground works over the coming years. As foreshore conditions continue to evolve in response to climate change, catchment pressures and community use, adaptive management will be critical to maintaining ecological integrity and public amenity. To strengthen future FMP updates, the following areas of improvement are recommended:

- Undertake a detailed feature survey of the entire foreshore to provide a consistent and up-to-date spatial baseline for future planning, monitoring and design. This should include topographic, vegetation, infrastructure and erosion features, as well as the adjacent infrastructure services and utilities. This will enable an accurate assessment of change over time as a result of management actions and improved integration with the City's asset management systems.

- In collaboration with DBCA, review and refine the foreshore asset classification system to assess consolidated foreshore areas rather than focusing solely on individual structural elements or features (e.g. revetments or natural edges). Revetments and other built structures should be recognised as components within a broader foreshore area and assessed separately, with their condition scores contributing to the overall foreshore condition rating. This approach will provide a more integrated understanding of ecological, structural, and functional performance across the foreshore landscape.

- Adjust ecological, social, and cultural monitoring programs to align with the revised foreshore classification framework, ensuring that data collection and reporting are consistent across consolidated foreshore areas. This will enable results to be quantified more effectively, support trend analysis, and provide clearer links between management actions, condition outcomes, and community values.

- Establish a centralised database system to record and track foreshore restoration works, including project budgets, maintenance schedules, and implementation timelines. This system should enable transparent reporting, facilitate coordination across teams, and support long-term evaluation of restoration outcomes against management objectives and budget performance.

- Incorporate updated sea-level rise and extreme weather projections to guide adaptive management, retreat planning and future infrastructure design. Scenario mapping and sensitivity testing will help evaluate the long-term feasibility of both engineered and nature-based solutions.

- Support the inclusion of targeted trials such as alternative, bioengineering designs, or hybrid protection systems to test new approaches before city-wide application.
- Maintain ongoing revegetation of the foreshore and the purchase of advanced sedge stock to ensure faster and more resilient vegetated shoreline wherever possible.
- Maintain a formal five-year review cycle supported by an annual summary of works and outcomes. These reviews should include an assessment of progress toward ecological and community goals, identification of emerging risks, and prioritisation of future investment needs. However, given that significant foreshore adaptation projects, particularly those involving managed retreat or large-scale reconfiguration, require longer lead times for planning, design and implementation, future iterations of the Foreshore Management Plan should adopt a 10-year planning horizon to provide adequate strategic continuity and investment certainty.

Together, the above actions will ensure the next Foreshore Management Plan is data-driven, climate-responsive, and community-aligned, providing the City of Melville with a resilient framework for the long-term stewardship of its foreshore environments for generations to come.

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APPENDICES

Appendix 1. Legislation applicable to the management of City of Melville foreshore

Appendix 2. Foreshore Assessment Methods

Appendix 3. Foreshore asset condition assessment

Appendix 4. Prioritisation of sites for Restoration 2025 – 2030.

Appendix 5. Review of 2019 Foreshore Restoration Strategy

Appendix 6. Foreshore Flora and Vegetation Lists and Descriptions (after NAMS, 2024)

Appendix 7. Foreshore Fauna List (After NAMS, 2024)

Appendix 8. Stakeholder Engagement Summary

Appendix 9. Concept Plan Sketches

Appendix 1. Legislation applicable to the management of City of Melville foreshore.

Item	Relevant Legislation	Approval Agency	How it applies
Biodiversity	*Biodiversity Conservation Act 2016*	DBCA	Maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development.
	Environment Protection and Biodiversity	DWER	Protection of native flora and fauna species. Protection of conservation of nationally significant flora and fauna.
	Conservation Act 1999 (EPBC Act).		
	Biosecurity and Agriculture Management Act 2007	DPIRD	Manage the impact and spread of those pests already present in the state. Safely manage the use of agricultural (e.g. weed control chemicals) and veterinary chemicals.
Acid Sulfate Soils	*Environmental Protection Act 1986*	DWER	Acid Sulfate Soil Management - Provides guidance on how to investigate and manage risks associated with Acid Sulfate Soils appropriately.
Contaminated Sites	*Contaminated Sites Act 2003* and associated regulations *(Contaminated Sites Regulations 2006)*	DWER	Contaminated sites management Provides for the identification, recording, management and remediation of contaminated sites. Reporting of potential new contaminated sites where applicable Approval of Acid Sulfate Soil Management Plan
	Environmental Protection (Unauthorised Discharges) Regulations 2004		Prevent and / or report any unauthorised discharges
	Environmental Protection Act 1986		Irrigation/groundwater use licensing
	Contaminates Sites Act 2003		Prevent and / or report any unauthorised discharges
Groundwater	*Rights in Water and Irrigation Act 1914*	DWER	Irrigation/groundwater use licensing As per guidelines License to take groundwater (abstraction).
	Water Services Act 2012		
	Water Quality, Guidelines for Fresh and Marine Waters (ANNZECC, 2000)		
	Rights in Water and Irrigation Act 1914		
	Stormwater Management Manual for Western Australia, updated 2022		Stormwater Management
	Decision process for stormwater management in Western Australia 2017		License to take groundwater (abstraction).
Stormwater	National Water Quality Management Strategy: Australian Guidelines for Urban Stormwater Management 2000	DWER	Stormwater Management Establishes the Swan River Trust to manage and conserve the Swan and Canning Rivers, protecting their values and health

Item	Relevant Legislation	Approval Agency	How it applies
	Swan and Canning Rivers Management Act 2006	Swan River Trust / DBCA	Provides a framework for environmental protection and management, including pollution control and conservation.
	Environmental Protection Act 1986 (WA)	DWER	
Swan River	*Planning and Development Act 2005 (WA)*	WAPC	Regulates land use planning and development, influencing activities along the Swan River foreshore and catchment areas.
	Conservation and Land Management Act 1984 (WA)	DBCA	Addresses conservation and management of biodiversity and natural resources, potentially impacting Swan River habitats.
	Aboriginal Heritage Act 1972 (WA)	DPLH	Protects Aboriginal heritage sites and objects, requiring consultation and permits for activities affecting such sites.
	Water Agencies (Powers) Act 1984 (WA)	DWER	Empowers water management authorities to regulate water resources, including those of the Swan River.
	A Compilation of Australian Standards on Water Holding Tanks	DoH	summarizing Australian standards for designing, building, installing, and maintaining water tanks, ensuring they meet quality and safety regulations.
	Best practice guidance for the notification and risk management of sewage overflows into buildings	DoH	Guidelines for managing and minimizing risks associated with sewage overflows into buildings.
	DBCA Policies, plans and guidelines manual	DBCA	The policies, plans and guidelines provide direction and guidance on what information DBCA considers when assessing an application for permits, land use planning and development in, adjacent to, or affecting the waters of the Swan Canning Development Control Area (DCA).
	Wastewater after cyclones floods and other disasters (HealthyWA)	DoH	Provides guidelines for managing wastewater after cyclones, floods, and other disasters.
	Western Australian Guidelines for Biosolids Management	DoH	Provides recommendations for managing and disposing of biosolids in compliance with regulations
	Environmental Protection Act 1986	EPA	Approval to undertake an assessed proposal, with conditions
	Soil and Land Conservation Act 1988	DPIRD	Conservation of soil and land resources and mitigation of the effects of erosion, salinity and flooding.
Erosion affecting adjacent areas	*State Planning Policy No. 3.4 Natural Hazards and Disasters*	DPIRD	Conservation of soil and land resources and mitigation of the effects of erosion, salinity and flooding.

Item	Relevant Legislation	Approval Agency	How it applies
Bush fire	*Bush Fires Act 1954*	DFES	Provision for diminishing the dangers resulting from bush fires, for the prevention, control and extinguishment of bush fires and for other purposes. Minimise the adverse impacts of natural disasters (including fires) on communities, the economy and the environment.
	Public Health Act 2016 (WA) *Health (Miscellaneous Provisions) Act 1911 (WA)*		This act empowers the Department of Health and local government authorities to manage public health risks, including vector-borne diseases transmitted by mosquitoes. It may include provisions for mosquito control programs and measures to prevent mosquito breeding. This act may include provisions related to public health nuisances, which can encompass mosquito infestations and breeding sites.
Mosquito management	*Environmental Protection Act 1986 (WA)*	DoH	This legislation addresses environmental management and protection in Western Australia. While not specific to mosquitoes, it may include provisions relevant to managing water bodies and habitats to reduce mosquito breeding.
	Local Government Bylaws	LGA	Local councils in Western Australia may have specific bylaws related to mosquito management within their jurisdictions. These may include regulations on standing water, sanitation, and other measures to prevent mosquito breeding.
	Biosecurity and Agriculture Management Act 2007 (WA)		While primarily focused on agricultural biosecurity, this act may include provisions related to preventing the introduction and spread of diseases transmitted by mosquitoes.
	Pest Control Regulations 1988 (WA)		These regulations may cover the use of pesticides and other control methods for managing pest populations, including mosquitoes.
	Water Agencies (Powers) Act 1984 (WA)		This act empowers water management authorities in Western Australia to regulate water resources, including water bodies where mosquitoes breed.

Appendix 2. Foreshore Assessment Methods.

FORESHORE ASSESSMENT METHODS

A field-based condition assessment was undertaken for the length of the foreshore in early March 2025. The area extended from Bicton to Bull Creek including approximately 18km of City of Melville foreshore across each of 12 COM study units (Appendix A). The assessment was conducted over 102 field segments corresponded to previously determined DBCA foreshore segments classified as built and natural assets (Appendix A).

The methodology employed followed a previously adopted process for the Swan River to assess asset condition, consequence of impacts to assets, the presence/absence of local failure, mechanisms for erosion that are active at each site along with the likelihood of foreshore response within discrete timeframes and maintenance comments where applicable.

Information was recorded as follows and provided in the accompanying EXCEL field assessment database:

- Asset Name
- Asset Type
- Condition Score 1(good) to 5(bad)
- Condition Comment
- Local Failure (Y or N)
- Consequence score 1(good) to 5(bad)
- Consequence comment
- Maintenance Comment
- Identification of hazards
- Rater and Date
- Likelihood

Information collected in the field was collated and used to produce an Overall Condition Index (OCI) calculated from Condition and consequence scores.

The criteria used to determine each of the assessment elements are discussed in the remainder of this Appendix with corresponding scales provided where appropriate. The information provided here should be considered in conjunction with the condition assessment outputs and discussion in Report Section 1.3 above.

B1. Condition

The condition of natural assets was assessed according to a 1 to 5 ranking. Separate assessment criteria were determined for overarching shore types:

1. Rocky shore (Table A)

2. Vegetated shore (Table B)

3. Sedimentary shore (Table C)

When undertaking the assessment, the criteria used to rate the condition were noted in the Condition Comments (Cond_Comm) recorded in an EXCEL database. Any focal areas of condition 4 or 5 are noted in a separate column.

Criteria incorporate a component of the alongshore extent of indicators of poor condition or failure. Key factors for each asset type are:

- **Rocky shore – Cliffs**: Collapse, block failure, cracking, undercutting, erosion at the base (e.g. no talus or beach) and vertical slips/scarping.
- **Rocky shore – Rocky Emergent**: erosion behind and around the rock features generally involving retreat and scarping, embayed retreat or slumping. For pool/riffle systems the extent of vertical scarping was also considered.
- **Sedimentary – Beach:** beach width, beach grade, alongshore extent and height of scarping at the back of the beach (or other erosion such as embayed retreat) and foreshore retreat. Broad terraces were not included directly within the criteria, but will be considered on a case-by-case basis in terms of increased foreshore resilience.
- **Sedimentary – Exposed Bank:** alongshore extent of erosion, height of scarp/slumping/undercutting, tree coverage (by definition <50%), height of bank and retreat.
- **Sedimentary – Perched beach**: Same as beach.
- **Sedimentary – Scarp**: height of scarp, alongshore extent of scarp, cross-shore width of scarp.
- **Sedimentary – Embankment:** height of exposed banks, level of sedimentation and braiding, tree coverage, active erosion of banks subject to approximately average winter flow levels.
- **Vegetated – Sedges:** Width of sedge (varied criteria for estuarine and fluvial environments), alongshore cover, destabilisation processes. Bank steepness and terrace presence were not included directly within the criteria but will be considered on a case-by-case basis.
- **Vegetated – Tree Lined:** Width of trees, alongshore cover, destabilisation processes, erosion/undercutting and bank steepness

Rocky (a – cliffs, b – rocky emergent (inc. pool/riffles)				
Rating	**Condition descriptor**	**Performance**	**Photo (with associated code)**	**Detail**
1	(a) Relatively stable	Good Condition		(i) cliffs/steep bank with talus or beach buffer ensuring cliff/steep bank is generally protected from the hydraulic zone in most conditions. No undercutting/incising/cracking/slips.
	(b) Relatively stable			(i) low elevation bank surrounding rock with good veg cover and no undercutting/incising/slumping OR (ii) low elevation rocky foreshore with talus or beach buffer ensuring upper bank is generally protected from the hydraulic zone in most conditions OR (iii) steep bank to landward with <10% undercutting/incising/slumping. (iv) pool-riffle system with limited erosion and trampling of the riverbanks
2	(a) Limited areas of undercutting or low elevation slip failure	Minor Defects		(i) 10-25% undercutting/incising. (ii) vertical scarps or slips 0.2 - 0.5m height
	(b) Limited areas of undercutting, embayed retreat or low elevation scarps			(i) 10-25% undercutting/incising/erosion OR (ii) embayed retreat 1-4m, 10-33% OR (iii) embayed retreat 0.3-1m, 33-67% OR (iv) vertical scarps or slips 0.2-0.5m height (v) pool-riffle system with scarping, some sedimentation and some trampling of the banks
3	(a) Some undercutting, cracking or slip failure	Fair Condition		(i) 25-50% length undercutting/incising OR (ii) cracking 5-33% OR (iii) vertical scarps/slips of 0.5 to 1m vertical height.
	(b) Some undercutting, embayed retreat or scarps			(i) 25-50% length undercutting/incising OR (ii) embayed retreat 1-4m, 33-67% OR (iii) embayed retreat 0.3-1m, >67% OR (iv) embayed retreat >4, 10-33% OR (v) vertical scarps/slips of 0.5 to 1m vertical height. (vi) pool-riffle system with extensive sedimentation and trampling
4	(a) Moderate undercutting, cracking or slip failure	Poor Condition		(i) >0.5m horizontal undercutting/incising (>50% length) OR (ii) cracking >33% OR (iii) vertical scarps/slips of 1-2m horizontally/1-2m vertical height
	(b) Moderate undercutting, embayed retreat or scarps			(i) >0.5m horizontal undercutting/incising/slumping (>50% length) OR (ii) embayed retreat 1-4m >67% OR (iii) embayed retreat >4m, 33-67% OR (iv) vertical scarps/slips of 1-2m horizontally/1-2m vertical height
5	(a) Collapsed or large slip failure	Failed Shoreline		(i) evidence of recent (<5 year?) cliff collapse OR (ii) slip failure on steeply scarped foreshore OR (iii) vertical scarps/slips of >2m horizontally/>2m vertical height.
	(b) Extensive undercutting, embayed retreat or scarps			(i) embayed retreat of >4m (and >67% alongshore) [implies rocks aren't providing control for stability] OR (ii) >1m horizontal undercutting/incising/slumping (>50% length) OR (iii) vertical scarps/slips of >2m horizontally/>2m vertical height.
Note: Pool-riffle systems with rocky riffles were only considered to be ranked as conditions 1 to 3 due to the nature of their definition on the Swan-Canning. They are generally long subsegments in areas subject to adequate winter river flows on the Swan River to scour sediment from the pools. Sedimentation occurs upstream and downstream of the steeper river gradient pool-riffle areas.				

Vegetated (a – sedge, b – tree lined)				
Rating	**Condition descriptor**	**Performance**	**Photo (with associated code)**	**Detail**
1	(a) Wide sedge area with good alongshore coverage	Good Condition		(i) veg width >20m (non-estuarine 10-20m), veg cover >90% OR (ii) veg width >20m (non-estuarine 10-20m), veg cover 70-90% OR (iii) veg width 10-20m (non estuarine 3-10m), veg cover 100% OR (iv) veg cover 50-70%, and only areas width <5m are in allocated recreational beaches or boat ramps (v) Destabilising processes by human extra influence impacting <10% of the alongshore length
	(b) Wide tree cover or low damage			(i) >10m tree width, veg cover 100%, 0% undercutting, <10% erosion and steepness <1:1 OR (ii) low damage factors (iii) Destabilising processes by human extra influence impacting <10% of the alongshore length
2	(a) Wide sedge area with adequate coverage or moderate width sedge and good coverage	Minor Defects		(i) veg cover >90%, veg width 10-20m (non-estuarine 3-10m) OR (ii) veg cover 70-90% and width 10-20m (non-estuarine 3-10m) OR (iii) veg width 3-10m (non estuarine 1-3m) and veg cover 100% OR (iv) veg cover 50-70% and only areas with <3m width are in allocated recreational beaches or boat ramps (v) Destabilising processes by human extra influence impacting 10-25% of the alongshore length
	(b) Moderate to wide tree cover with low undercutting for steep banks or wide tree cover with moderate undercutting for gentle-grade banks.			(i) 5-10m tree width, veg cover >70%, 10-40% undercutting, steepness >1:1 OR (ii) >10m tree width with lots of erosion, steepness >1:1 OR (iii) 5-10m tree width, veg cover 50-70%, 40-70% undercutting and steepness <1:1 (iv) Destabilising processes by human extra influence impacting 10-25% of the alongshore length
3	(a) Narrow band of sedge with good coverage or moderate width sedge with adequate coverage	Fair Condition		(i) veg width 3-10m (non-estuarine 1-3m), veg cover >90% OR (ii) veg width 3-10m (non-estuarine 1-3m), veg cover 70-90% OR (iii) veg width 1-3m (non estuarine <1m), veg cover 100% (iv) Destabilising processes by human extra influence impacting 25-50% of the alongshore length
	(b) Single line of trees with good alongshore coverage OR moderate width with moderate undercutting			(i) single line of trees with veg cover >90% OR (ii) tree width 5-10m, veg cover 50-70%, 10-40% undercutting and steepness <1:1, OR (iii) tree width 5-10m, veg cover >70%, steepness >1:1 (iv) Destabilising processes by human extra influence impacting 25-50% of the alongshore length
4	(a) Narrow band of sedge with limited coverage	Poor Condition		(i) veg width 1-3m (non-estuarine <1m), veg cover 50-70% OR (ii) veg width 1-3m (ie single line of sedge) [non estuarine <1m], veg cover 90% OR (iii) veg width 1-3m (<1m for non-estuarine), veg cover 70-90% (iv) Destabilising processes by human extra influence impacting >50% of the alongshore length
	(b) Single line of trees with >30% alongshore tree loss and >40% undercutting/erosion			(i) Single line of trees with veg cover 50-70%, >40% undercutting, >30% erosion (check steepness >1:1) (iii) Destabilising processes by human extra influence impacting >50% of the alongshore length
5	(a) Limited sedge remaining and no longer providing stabilisation	Failed Shoreline		(i) veg width <1m (estuarine areas) with veg cover 50-70% and no wetlands to landward Note: failed sedges would be classed as sedimentary or tree-lined. There may only be a few condition 5 sedge foreshores
	(b) Single line of trees with >50% erosion on steep bank			(i) Single line of trees on bank >1:1 grade with veg cover 50-70% (check 70% undercutting, >50% erosion) Note: failed tree-lined bank would be classed as sedimentary. There may only be a few condition 5 tree-lined foreshores

Sedimentary 1 of 2 (a–beach/perched, b–exposed bank)				
Rating	**Condition descriptor**	**Performance**	**Photo (with associated code)**	
1	(a) Relatively stable	Good Condition		(i) wide beach (>10m), gentle grade (<1V:6H) and <10% alongshore erosion to landward
				(ii) beach width >4m and accreted >1m from 2008-2015
				(iii) low damage factors to landward with minimal scarping, undercutting and retreat
	(b) Relatively stable			(i) Vertical scarps/exposed face of <0.3m for <50% of the alongshore length (trees/sedge may cover 50% of the shoreline)
				(ii) low damage factors (<10% alongshore extent of undercutting/incising/slumping)
				(iii) Destabilising processes by human extra influence impacting <10% of the alongshore length
2	(a) Limited areas of erosion of the beach or of the bank behind the beach	Minor Defects		(i) Beach width >4m and <10% erosion
				(ii) Beach grade >1:6 and <10% alongshore erosion
				(iii) Beach grade <1:6 and 10-40% alongshore erosion with scarping <0.5m vertically
				(iv) Some realignment of the beach from 2008-2015 with no gross change
				(v) Scarps of 0.2-0.5m vertically on bank to landward
	(b) Limited areas of, or low elevation, erosion indicators			(i) 40-50% vegetation cover and ~50% alongshore extent of undercutting/incising/slumping of 0.5-0.75m height
				(ii) Vertical scarps/exposed face of 0.3-0.75m for 20-50% of the alongshore length
				(iii) Vertical scarps/face of <0.3m vertical height for >50% of the alongshore length
				(iv) Destabilising processes by human extra influence impacting 10-25% of the alongshore length
3	(a) Some erosion of the beach or of the bank behind the beach	Fair Condition		(i) Beach width <1m and 10-40% erosion
				(ii) Beach grade >1:6 and 10-40% alongshore erosion with >40% scarping along the backshore
				(iii) Beach grade <1:6 and 40-70% alongshore erosion
				(iv) Realignment of the beach from 2008-2015 (gross change 0.5-2m horizontal)
				(v) Scarps of 0.5-1m vertically on bank to landward
	(b) Some areas of, or low-to-moderate elevation, erosion indicators			(i) 20-40% vegetation cover and >60% alongshore extent of undercutting/incising/slumping of 0.5-0.75m height
				(ii) Vertical scarps/exposed face of 0.75 to 1.5m for 20-50% of the alongshore length
				(iii) Vertical scarps/exposed face of 0.3 to 0.75m vertical height for >50% of the alongshore length
				(iv) Retreat of 2-5m across 20-50% of the alongshore length from 2008-2015 (this may most likely be a condition 4)
				(v) Destabilising processes by human extra influence impacting 25-50% of the alongshore length
4	(a) Moderate erosion of the beach or of the bank behind the beach	Poor Condition		(i) Beach width <1m and 40-70% erosion
				(ii) Beach grade >1:6 and 40-70% alongshore erosion with >40% scarping along the backshore with scarps >1m height
				(iii) Beach grade <1:6 and >70% alongshore erosion
				(iv) Retreat of 2-5m from 2008-2015 or realignment of the beach (gross change >2m horizontal)
				(v) Scarps of 1-1.5m vertically on bank to landward
	(b) Moderate areas of, or moderate-to-high elevation, erosion indicators			(i) 10-20% vegetation cover and >80% alongshore extent of undercutting/incising/slumping of 0.75-1m height
				(ii) Vertical scarps/exposed face of >1.5m for 20-50% of the alongshore length
				(iii) Vertical scarps/exposed face of 0.75-1.5m vertical height for >50% of the alongshore length
				(iv) Retreat of 2-5m across >50% of the alongshore length from 2008-2015
				(v) Destabilising processes by human extra influence impacting >50% of the alongshore length
5	(a) Extensive erosion of the beach or of the bank behind the beach	Failed Shoreline		(i) Beach width <1m and >70% alongshore erosion
				(ii) Beach grade >1:6 and >50% alongshore erosion with >70% scarping along the backshore with scarps >1m height
				(iii) Retreat of >5m from 2008-2015

Sedimentary 1 of 2 (a–beach/perched, b–exposed bank)				
Rating	**Condition descriptor**	**Performance**	**Photo (with associated code)**	
			 5bii, 5biii	(iv) Scarps of >1.5m vertically on bank to landward
	(b) Extensive erosion on moderate to high elevation exposed banks			(i) 0% vegetation cover and >90% alongshore extent of undercutting/incising/slumping of >1m height (ii) Vertical scarps/exposed face of >1.5m vertical height for >50% of the alongshore length (iii) Retreat of >5m across >50% of the alongshore length from 2008-2015

Sedimentary 2 of 2 (c – scarp, d – embankment)				
Rating	**Condition descriptor**	**Performance**	**Photo (with associated code)**	
1	(c) Relatively stable	Good Condition	No photos available for these criteria	(i) Scarped foreshore with talus or beach buffer ensuring upper bank is generally protected from the hydraulic zone in most conditions (ii) <10% undercutting/incising/slumping/scarping/slip failure (technically wouldn't be defined as a scarp).
	(d) Relatively stable			(i) vertical scarps <10% of alongshore length (ii) straight or meandering channel (implying low sedimentation) (iii) bare sediment for <30% of alongshore length (>70% vegetation)
2	(c) Limited areas of, or low elevation, vertical scarps or slips	Minor Defects	 2cii	(i) vertical scarps or slips 0.2 - 0.5m height for >50% of the alongshore length (ii) vertical scarps/slips of 0.5 to 1m vertical height for 20-50% of the alongshore length
	(d) Some sedimentation, limited areas of scarps and limited bare sediment			(i) vertical scarps 10-25% of alongshore length (ii) some sedimentation, with a meandering channel with <25% braided (iii) bare sediment for 30-50% of alongshore length (50-70% vegetation)
3	(c) Some areas of low-to-moderate elevation vertical scarps or slips	Fair Condition	 3cii	(i) vertical scarps/slips of 0.5 to 1m vertical height for >50% of the alongshore length (ii) vertical scarps/slips of 1-2m horizontally/1-2m vertical height for 20-50% of the alongshore length
	(d) Moderate sedimentation, some scarps and moderate vegetation cover			(i) vertical scarps 25-50% of alongshore length (ii) moderate sedimentation, with braided or meandering channel (iii) bare sediment for 50-70% of alongshore length (30-50% vegetation)
4	(c) Moderate areas of moderate-to-high elevation vertical scarps or slips	Poor Condition	4cii, 4ciii 	(i) Retreat of 2-5m across >50% of the alongshore length from 2008-2015 (ii) vertical scarps/slips of 1-2m horizontally/1-2m vertical height for >50% of the alongshore length (iii) vertical scarps/slips of >2m horizontally/>2m vertical height for 20-50% of the alongshore length
	(d) High sedimentation, moderate scarps and limited vegetation cover			(i) vertical scarps on banks of main river channel for 50-70% of alongshore length (ii) high sedimentation, with braided channel (iii) bare sediment for 70-90% of alongshore length (10-30% vegetation)
5	(c) Extensive areas of high elevation vertical scarps or slips or extensive retreat	Failed Shoreline		(i) vertical scarps/slips of >2m horizontally/>2m vertical height for >50% of the alongshore length. (ii) Retreat of >5m across >50% of the alongshore length from 2008-2015

Sedimentary 2 of 2 (c – scarp, d – embankment)				
Rating	**Condition descriptor**	**Performance**	**Photo (with associated code)**	
	(d) Extensive sedimentation, extensive scarps or poor vegetation cover			(i) vertical scarps on banks of main river channel for >70% of alongshore length (ii) extensive sedimentation, with anastomosing channel (iii) bare sediment for >90% of alongshore length (<10% vegetation)

Field photographs were recorded along the length of each segment as appropriate with focused consideration of any areas of local failure. Field photographs have been geotagged and added to a project GIS to provide a visual support for the condition assessment results provided. A folder with photography for each of the 102 segments has also been collated as an additional resource to be delivered to COM.

Condition of built assets was assessed for areas of foreshore with walls, revetments, gabions and groynes. Foreshore protection assets were the focus of this assessment due to their impact on foreshore stability. Condition of jetties, boardwalks, steps and other aquatic structural assets in COM was assessed by MRA (2024). While the condition of walls, gabions, revetments and groynes also rated by MRA (2024), consequences were not assigned and were therefore all built structures needed to be revisited to inform an updated foreshore management strategy for the City.

Table A: Description of built foreshore assets (from Oceanica, 2007)

Type	Description	Example
Wall	Steep foreshore structure (>60°). Usually constructed from concrete, steel, rock or timber. Includes: 1. Sheet piling; 2. Concrete panels; 3. Limestone blocks; 4. Rubble walls; and 5. Log and other timber walls.	
Revetment	Inclined foreshore structure (<60°). Usually constructed from rock. Material can be tipped, placed or cut to fit together.	
Gabions	Baskets filled with rock units. These porous cages can be constructed as a wall, revetment or toe protection. Often placed in conjunction with revegetation.	
Groynes	Shore-connected, and often shore-perpendicular, structures placed to reduces the quantity of alongshore sediment transport by partitioning the shoreline.	

Structural condition was assessed according to a 1 to 5 ranking:

Table E: Condition Rating for Built Assets

Rating	Performance	Description
1	Good Condition	Newly installed or upgraded
2	Minor Deterioration	The asset shows early stages of deterioration
3	Fair Condition	Obvious deterioration and some service delivery losses
4	Poor Condition	Shows severe signs of deterioration, with prompt action required to avoid failure
5	Failed Asset	The asset has failed and no longer provides function/service

B.2 Likelihood

An additional dataset was required to modify the condition rating, providing an indicator of potential timeframe of foreshore response. This follows from the traditional approach of assessing risk which incorporates value/consequence and likelihood. It was felt necessary because indicators of 'poor' condition may not represent imminent risk of failure, as the processes likely to cause adverse consequences may be episodic, with potentially long times between stresses. Elsewhere in the Swan River, this was illustrated for Ashfield Parade and Fauntleroy Avenue, with 'poor' conditions identified in 1990 (Marine & Harbours 1990) noted to have changed little by 2005 (Damara 2005) and 2013 (Damara WA 2013).

Values for likelihood (Table F) have followed from the approach already used in the Swan-Canning for the BMP (2009), based on a simple assessment of processes.

Table F: General rating for likelihood (after BMP 2009)

Likelihood	Descriptor	Likely Impact Timeframe
1	Low	Only during an extreme event.
2	Moderate	Within more than a few years
3	High	Within approximately one year, which may include sites exposed to storms anticipated on an annual basis.

B.3 Consequence

A five-point ranking of consequence was applied for each segment assessed using the outlined in Table B).

It should also be noted that private property value to landward was neglected from consideration of consequence as the focus is on public assets.

Table B: Consequence Rating (DBCA Supplied)

Rank	Rating	Consequence Descriptions
1	Insignificant	• Loss of $0-$1,000 • Impact resolved: can be repaired within 1 month • Unlikely to be raised in public; Complaints unlikely to be received • No or little impact on existing recreational uses • Significant setback remains (relative to natural asset type & river conditions) • Bare or exotic grassed area impacted
2	Minor	• Loss $1,000-$10,000 • Impact repairable; can be repaired 1-6 months • Local adverse media coverage: some complaints received • Reduction of one or more recreational uses. • Setback suitable (relative to natural asset type and river conditions) • Single line of trees/scattered vegetation impacted
3	Moderate	• Loss $10,000-$100,000 • Environmental damage; can be repaired within 6-12 months • Adverse media coverage; coordinated representation • Number of recreational uses reduced by half • Setback not suitable (relative to natural asset type and river conditions) • Vegetated foreshore/bushland impacted
4	Major	• Loss $100,000-$1,000,000 • Long term environmental damage; will require at least 12 months to repair • Only informal passive recreation possible (ie walking on goat tracks) • Setback significantly compromised (relative to natural asset type and river conditions) • Quality foreshore vegetation/bushland impacted (few weeds, structure evident, little disturbance)
5	Catastrophic	• Loss of more than $1.0M of infrastructure • Irreversible impact; cannot be repaired or restored • Inquiry, dismissal or persecution • Long term reputational damage at state level • Nil recreation possible • Nil setback • A Class nature Reserve or bush forever site impacted
Note: *this scale intentionally excludes personal injury.*		

B.4 Overall Condition Index (OCI)

A simple method of combining condition and consequence into an overall condition index (OCI) was used as a first pass approach for identification of priority sites along the City of Melville foreshore. This approach has limitations, but is a consistent approach used for the 2012-2015 structure assessment (Damara WA 2015; MP Rogers & Associates 2012).

Table C: Overall Condition Index (OCI) for Consequence and Condition

Colour coding corresponds to combined rank with dark green (1 – low priority), light green (2), yellow (3), peach (4), orange (5) and red (6 – high priority). After MP Rogers & Associates (2012)

		Condition				
		1	**2**	**3**	**4**	**5**
Consequence	**5**	5	10	15	23	25
	4	4	9	14	20	24
	3	3	8	13	19	22
	2	2	7	12	18	21
	1	1	6	11	16	17

Condition and likelihood were combined to form a 5-point revised condition rank with a clarification of likely timeframe.

Table D: Revised Condition Rank including Likelihood

dark green (1 – good condition), light green (2), yellow (3), orange (4) and red (5 – failed condition).

		Condition				
		1	**2**	**3**	**4**	**5**
Likelihood	**1 (2 multiplier)**	1 (2)	1 (4)	2 (6)	3 (8)	4 (10)
	2 (3 multiplier)	1 (3)	2 (6)	3 (9)	4 (12)	5 (15)
	3 (4 multiplier)	1 (4)	3 (8)	4 (12)	5 (16)	5 (20)

B.5 Maintenance Comments

Simplified three-word descriptors with respect to maintenance were provided with field notes as per Table J.

Table J: Three Word Descriptors for Maintenance Comments (after FAMS: SRT 2008)

Objective: To protect and enhance the riverbanks and shorelines to mitigate threats to foreshore values		
Issue	**Management Strategy**	**Three Word Descriptor**
Inadequate foreshore setback	Managed migration. Where appropriate, allow natural erosion processes to occur (i.e.: outside meander bends and mobile sedimentary shores). This may require removal of some infrastructure and restricting public access.	Managed foreshore migration
	Ensure future developments have sufficient foreshore setback to allow for inundation and channel planform / bank migration.	Ensure sufficient setback
	Address potential for increased flooding and inundation in prone areas.	Address increased inundation
	Undertake renourishment where appropriate.	Renourish where appropriate
	Where valuable infrastructure or recreational amenity is threatened by erosion and renourishment is not an option, consider appropriate stabilisation works, including bioengineering.	Consider stabilisation works
Inadequate natural stability	Prepare a foreshore revegetation plan to widen vegetation buffer. Use bioengineering where appropriate. Ensure foreshore is stabilised when weeds are removed.	Widen vegetation buffer
	Manage recreation use areas by providing controlled pedestrian access, fishing platforms and minimise impact of boat launching and landing control.	Provide controlled access
	Fencing to minimise animal trampling with management of introduced animal pests.	Minimise animal trampling
Disturbance of sediment transport patterns	Investigate measures to reduce sedimentation, including increased river flow through dam release, review of private abstraction licences to ensure sufficient environmental flows, sediment extraction or removal of artificial barriers to flow.	Sedimentation reduction measures
	Reduce sediment input through a comprehensive sediment management plan.	Reduce sediment inputs
	Improve control of boating, including enforcement of low speed zones and establish low or no wash zones. Continue community awareness and education projects about boat wash.	Improve boating control
	Encourage retrofitting of existing drainage structures to incorporate sediment traps and design features to minimise scour. Promote stormwater management plan.	Retrofit drainage structure
	Encourage modification of fixed paths or other structures to landward to avoid runoff scour of the banks, particularly due to low points to landward (added since FAMS 2008)	Reduce overbank flow

Inadequate structural stability (unlikely to be relevant to natural foreshores)	Develop plan for monitoring and maintenance of structures, including structures which are no longer functional and could be removed.	Structure maintenance plan
	Identify mechanisms for sourcing funds (including Riverbank) to support maintenance works.	Source maintenance funding

B.6 Characterisation of Erosion Mechanisms

Mechanisms for erosion at each site were interpreted while in the field, using the scheme identified in FAMS (SRT 2008).

Table K: Erosion Mechanisms

Mechanism	Description
Energetic Wave Conditions	Often associated with quite dramatic loss on beaches during single storm events.
Increase in Mean Water Level	Causes an upwards migration of the active hydraulic zone.
Decrease in Mean Water Level	Lowered water levels cause a downwards migration of the active hydraulic zone.
Vegetation Loss	Loss of vegetation tends to provide a bank that is less resistant to hydraulic action.
Sediment Sink/Sources	Locations where there is an imbalance of sediment transport experience net erosion or accretion.
Sediment Deficit	Change that alters the prevailing sediment transport conditions, removing a quantity of sediment from active forcing before normal transport patterns return.
Strong Currents	Located principally where there are restrictions in cross-sectional area.
Seasonality	Both the intensity of prevailing conditions and their persistence may affect the net sediment transport rate.
Drainage Structures	Erosion associated with drainage outfalls may extend beyond the immediate vicinity of the flow path.
Flow over Banks	Erosion, often in the form of gully erosion, associated with water flowing directly over the banks due to drainage of overtopped water or as a result of stormwater runoff.
Sedimentation	Sedimentation of the channel decreases the channel cross-sectional area.
Trampling	Loss of vegetation and sediment can occur due to uncontrolled access, worm digging, boat launching and animal activity.

B7: Foreshore Segment Assessment – Explanation of Column Headings for the Associated Shapefile and Excel Worksheet

Code		Details	Built	Natural
FID	***Field ID***	**1-114 corresponding to DBCA Foreshore Segments for built and natural datasets**		
DATASET	*DBCA dataset Category*	Built Asset or Natural Asset		
asset_name	*DBCA Segment Name*	River Reach and asset dataset (Appendix A)	e.g. SLBic01 Point Walter East-Boat ramp and jetty.B06	e.g. SLApl02 Beach Rd to Coffee Pt Reserve.N04
asset_type	*Typology of Built or Natural Asset*	Built or Natural classes	Wall; Gabion; Groyne; Revetment Appendix B - Table D	Rocky; Vegetated; Sedimentary Appendix B - Tables A-C
cond_score	*Condition Score*	5-point rating of built and natural foreshore asset condition	1 (Good Condition) to 5 (Failed Asset) Appendix B - Table E	1 (Good Condition) to 5 (Failed Shoreline) Appendix B - Tables A-C
cond_comm	*Condition Comment*	Description of asset condition noting, for e.g. nature of deterioration and comparison to previous assessment	In-situ comments from field engineer assessment.	Appendix B - Tables A-C 'Details'
local_fail	*Local Failure*	Noting the presence (Y) and absence (N) of points of local failure within the segment	Description of failure - e.g. exposed footing near jetty	Description of failure - e.g. erosion scraps and loss of foreshore buffer (point source)
cons_score	*Consequence Score*	5-point rating of the consequences of the condition encompassing potential loss of infrastructure, amenity and environmental value	1(insignificant) to 5(catastrophic) Appendix B - Table G	
cons_comm	*Consequence Comment*	Description of the consequences of observed impacts	Economic, environmental, social, recreational - Appendix B Table G	
maint_comm	*Maintenance Comment*	Descriptors for maintenance comments related to key issues	Appendix B - Table J	
haz_risk		DBCA Erosion mechanisms - 12 categories & NA (Not Applicable)	Appendix B - Table K	

Code		Details	Built	Natural
rater	*Consultant undertaking Rating*	Name of Company		
rate_date	*Date of Assessment*	Date of Assessment		
likelihood	*Likelihood of foreshore response*	Potential timeframe of foreshore response on a 3-point scale	1 (Low - only during an extreme event to 3 (High - within one year) Appendix B - Table F	

Appendix 3. Foreshore asset condition assessment results by segments

COM	Name	Field Segment	Dataset	Asset Type	OCI	OCI_lik	Length (m)
COM 1. Quaada Gabee - Bicton Baths and Blackwall Reach Parade	SLBic06 Bicton Quarantine Park to Bicton Bath Reserve.B04	1	BUILT	Wall	12	12	79.6
	SLBic06 Bicton Quarantine Park to Bicton Bath Reserve.B03	2	BUILT	Revetment	9	9	75.4
	SLBic06 Bicton Quarantine Park to Bicton Bath Reserve.B02	3	BUILT	Wall	8	8	70.6
	SLBic06 Bicton Quarantine Park to Bicton Bath Reserve.N02	4	NATURAL	Sedimentary - Beach	8	8	118.3
	SLBic06 Bicton Quarantine Park to Bicton Bath Reserve.B01	5	BUILT	Wall	14	14	114.8
	SLBic06 Bicton Quarantine Park to Bicton Bath Reserve.N01	6	BUILT	Revetment	3	3	42.4
	SLBic06 Bicton Quarantine Park to Bicton Bath Reserve.N01	7	NATURAL	Sedimentary - Scarp	7	7	80.7
	SLBic05 Blackwall Reach Parade to Ledbrooke Street.N06	8	NATURAL	Sedimentary - Scarp	7	7	212.3
	SLBic05 Blackwall Reach Parade to Ledbrooke Street.N05	9	NATURAL	Sedimentary - Beach	13	13	80.9
	SLBic05 Blackwall Reach Parade to Ledbrooke Street.B03	10	BUILT	Wall	9	9	51.4
	SLBic05 Blackwall Reach Parade to Ledbrooke Street.B02	11	BUILT	Revetment	4	4	25.9
	SLBic05 Blackwall Reach Parade to Ledbrooke Street.N04	12	BUILT	Revetment	4	4	37.8
	SLBic05 Blackwall Reach Parade to Ledbrooke Street.B01	13	BUILT	Wall	9	9	59.4
COM 2. Jenalup - Blackwall Reach cliffs, little beaches, including Kent Street	SLBic05 Blackwall Reach Parade to Ledbrooke Street.N03	14	BUILT	Bioengineering	12	12	26.6
	SLBic05 Blackwall Reach Parade to Ledbrooke Street.N03	15	NATURAL	Sedimentary - Perched beach	12	12	24.6
	SLBic05 Blackwall Reach Parade to Ledbrooke Street.N02	16	BUILT	Bioengineering	7	7	23.8
	SLBic05 Blackwall Reach Parade to Ledbrooke Street.N01	17	NATURAL	Sedimentary - Perched beach	13	13	157.6
	SLBic04 Honour Avenue Point Walter Golf Course.N01	18	NATURAL	Rock Shore - Cliff	7	2	506.8
	SLBic03 Point Walter Reserve to Honour Avenue.N01	19	NATURAL	Rock Shore - Rocky Emergent	12	12	535.2
	SLBic02 Point Walter West.N01	20	NATURAL	Rock Shore - Rocky Emergent	7	7	152.2
COM 3. Dyoondalup - Point Walter Foreshore Reserve through to Attadale Dog Beach	SLBic02 Point Walter West.B01	21	BUILT	Revetment	13	13	49.8
	SLBic01 Point Walter East to Boat ramp and jetty.B06	22	BUILT	Revetment	19	22	47.5
	SLBic01 Point Walter East to Boat ramp and jetty.B05	23	BUILT	Groyne / Beach	8	3	158.2
	SLBic01 Point Walter East to Boat ramp and jetty.B04	24	BUILT	Revetment	13	13	68.0
	SLBic01 Point Walter East to Boat ramp and jetty.B03	25	BUILT	Groyne / Beach	13	8	277.9
	SLBic01 Point Walter East to Boat ramp and jetty.B02	26	BUILT	Revetment	3	3	111.2
	SLBic01 Point Walter East to Boat ramp and jetty.B01	27	BUILT	Revetment	7	2	52.5
	SLBic01 Point Walter East to Boat ramp and jetty.N01	28	NATURAL	Sedimentary - Beach	7	7	138.5
COM 4. Marradungup - Attadale Reserve from Page Street to Alfred Cove	SLAtt05 Burke Drive to Page Street.N01	29	NATURAL	Sedimentary - Beach	8	8	401.8
	SLAtt05 Burke Drive to Page Street.N01	30	NATURAL	Sedimentary - Beach	13	13	140.0
	SLApl10.N01	31	NATURAL	Vegetated - Sedges	8	8	703.6
	SLAtt03 Attadale Reserve Burke Drive to Tanson Street.N01	32	NATURAL	Vegetated - Sedges	14	9	606.9
	SLAlf01 Tompkins Park Avenue.N01	33	NATURAL	Vegetated - Sedges	14	14	783.8
	SLApl09 Melville to Beach Road to Cunningham Street.N01	34	NATURAL	Vegetated - Sedges	10	10	996.3

COM	Name	Field Segment	Dataset	Asset Type	OCI	OCI_lik	Length (m)
COM 5. Margamangup - Tompkins Park	SLAtt04 Attadale Reserve Burke Drive to Tanson Street.N01	35	NATURAL	Vegetated - Sedges	14	9	473.8
	SLAtt02 Troy Park.N01	36	NATURAL	Vegetated - Sedges	14	14	847.6
COM 6. Margamangup - Melville Beach Road	SLApl09 Melville to Beach Road to Cunningham Street.N01	37	BUILT	Bioengineering	14	14	176.4
	SLApl09 Melville to Beach Road to Cunningham Street.N01	38	BUILT	Wall	13	13	21.9
	SLAtt01 Alfred Cove Nature Reserve.N01	39	NATURAL	Vegetated - Sedges	14	14	56.4
	SLApl08 Beach Road to Dee Road.B03	40	BUILT	Revetment	8	3	168.9
	SLApl08 Beach Road to Dee Road.N01	41	BUILT	Bioengineering	9	9	510.7
	SLApl08 Beach Road to Dee Road.B02	42	BUILT	Revetment	8	3	168.4
	SLApl08 Beach Road to Dee Road.B01	43	BUILT	Gabion	13	13	65.3
COM 7. Moondaap - Majestic Cove and Point Dundas	SLApl07 Point Dundas Boardwalk to Jeff Joseph Reserve.N02	44	NATURAL	Sedimentary - Beach	13	19	486.6
	SLApl07 Point Dundas Boardwalk to Jeff Joseph Reserve.N01	45	BUILT	Revetment	13	19	275.8
	SLApl07 Point Dundas Boardwalk to Jeff Joseph Reserve.N01	46	NATURAL	Sedimentary - Beach	13	13	207.0
COM 8. Kooyagoordup - Jeff Joseph and the Strand	SLApl06 Jeff Joseph Reserve.N02	47	BUILT	Revetment	13	13	82.0
	SLApl06 Jeff Joseph Reserve.N02	48	BUILT	Bioengineering	13	13	29.3
	SLApl06 Jeff Joseph Reserve.B02	49	BUILT	Bioengineering	21	21	123.7
	SLApl06 Jeff Joseph Reserve.N01	50	NATURAL	Sedimentary - Beach	8	3	335.9
	SLApl06 Jeff Joseph Reserve.B01	51	BUILT	Groyne / Beach	7	2	119.3
	SLApl05 Point Heathcote Reserve.N02	52	NATURAL	Sedimentary - Beach	13	13	211.1
COM 9. Goolugatup foreshore	SLApl05 Point Heathcote Reserve.N02	53	NATURAL	Sedimentary - Beach	8	3	46.1
	SLApl05 Point Heathcote Reserve.N02	54	BUILT	Bioengineering	2	2	142.8
	SLApl05 Point Heathcote Reserve.B01	55	BUILT	Revetment	7	2	77.7
	SLApl05 Point Heathcote Reserve.N01	56	NATURAL	Rock Shore - Cliff	11	6	25.9
	SLApl04 Groyne.N01	57	NATURAL	Rock Shore - Rocky Emergent	6	1	133.1
	SLApl04 Groyne.N01	58	NATURAL	Revetment	6	1	40.2
COM 10. Gabbi Kowangulup - Coffee Point and Canning Beach Road	SLApl02 Beach Rd to Coffee Point Reserve.N05	60	NATURAL	Vegetated - Sedges	8	8	186.3
	SLApl02 Beach Rd to Coffee Point Reserve.N04	61	NATURAL	Sedimentary - Beach	19	22	23.0
	SLApl01 Beach Rd to Coffee Point Reserve.B06	62	BUILT	Revetment	3	3	44.4
	SLApl01 Beach Rd to Coffee Point Reserve.B05	63	BUILT	Revetment	13	19	98.5
	SLApl01 Beach Rd to Coffee Point Reserve.B04	64	BUILT	Revetment	19	22	149.6
	SLApl01 Beach Rd to Coffee Point Reserve.N02	65	NATURAL	Vegetated - Sedges	19	22	89.7
	SLApl01 Beach Rd to Coffee Point Reserve.B03	66	BUILT	Revetment	13	8	32.0
	SLApl01 Beach Rd to Coffee Point Reserve.N01	67	NATURAL	Vegetated - Sedges	19	22	373.7
	SLApl01 Beach Rd to Coffee Point Reserve.B02	68	BUILT	Revetment	13	13	74.9

COM	Name	Field Segment	Dataset	Asset Type	OCI	OCI_lik	Length (m)
	SLApl01 Beach Rd to Coffee Point Reserve.B01	69	BUILT	Wall	7	2	125.7
COM 11. Wagoorjup - The Esplanade North	SLApl01 Beach Rd to Coffee Point Reserve.B01	70	BUILT	Wall	8	3	31.3
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.B08	71	BUILT	Revetment	8	8	59.9
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.B08	72	NATURAL	Sedimentary - Beach	8	8	172.3
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.B07	73	BUILT	Wall	4	4	58.1
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.B06	74	BUILT	Groyne / Beach	13	13	62.9
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.B05	75	BUILT	Revetment	3	3	74.5
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.N04	76	NATURAL	Vegetated - Sedges	19	19	10.7
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.B04	77	BUILT	Gabion	19	22	19.6
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.N03	78	NATURAL	Vegetated - Sedges	13	13	82.3
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.B03	79	BUILT	Revetment	8	3	16.8
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.N02	80	NATURAL	Vegetated - Sedges	13	19	45.1
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.B02	81	BUILT	Gabion	8	3	62.2
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.N01	82	NATURAL	Vegetated - Sedges	13	19	38.3
	CLPle06 Apex Reserve to JohnXXIII Rowing Club.B01	83	BUILT	Revetment	13	19	74.7
	CLPle05 The Esplanade to Rookwood Street Jetty.N03	84	NATURAL	Vegetated - Sedges	13	19	81.5
	CLPle05 The Esplanade to Rookwood Street Jetty.B??	85	BUILT	Revetment	13	19	43.6
	CLPle05 The Esplanade to Rookwood Street Jetty.N02	86	NATURAL	Vegetated - Tree Lined	13	19	71.4
	CLPle05 The Esplanade to Rookwood Street Jetty.B01	87	BUILT	Revetment	8	8	22.9
	CLPle05 The Esplanade to Rookwood Street Jetty.N02	88	NATURAL	Vegetated - Tree Lined	13	19	75.6
	CLPle05 The Esplanade to Rookwood Street Jetty.N02	89	NATURAL	Vegetated - Sedges	13	19	312.3
COM 12. Wagoorjup – Deep Water Point	CLPle05 The Esplanade to Rookwood Street Jetty.N01	90	NATURAL	Sedimentary - Beach	3	3	227.6
	CLPle03 Henry Bridge.B10	91	BUILT	Groyne / Beach	3	3	183.3
	CLPle04 Deep Water Point Reserve.N01	92	NATURAL	Sedimentary - Beach	8	3	494.2
COM 13. Wagoorjup - The Esplanade South	CLPle03 Henry Bridge.B09	93	BUILT	Revetment	19	22	93.0
	CLPle03 Henry Bridge.N04	94	NATURAL	Vegetated - Tree Lined	13	13	161.0
	CLPle03 Henry Bridge.B08	95	BUILT	Revetment	13	8	93.6
	CLPle03 Henry Bridge.B07	96	BUILT	Revetment	19	19	149.2
	CLPle03 Henry Bridge.B06	97	BUILT	Wall	19	22	39.7
	CLPle03 Henry Bridge.B05	98	BUILT	Revetment	7	7	206.5
	CLPle03 Henry Bridge.N03	99	NATURAL	Vegetated - Sedges	12	7	60.5
	CLPle03 Henry Bridge.N02	101	NATURAL	Vegetated - Sedges	12	7	46.1
	CLPle03 Henry Bridge.B03	102	BUILT	Revetment	8	3	24.3
	CLPle03 Henry Bridge.N01	103	NATURAL	Vegetated - Sedges	12	12	28.1
	CLPle03 Henry Bridge.B02	104	BUILT	Wall	2	2	31.2

COM	Name	Field Segment	Dataset	Asset Type	OCI	OCI_lik	Length (m)
	CLPle03 Henry Bridge.B01	105	BUILT	Revetment	4	4	41.7
	CLPle02 The Esplanade to Regents Way.N01	106	NATURAL	Vegetated - Tree Lined	18	18	191.9
	CLPle02 The Esplanade to Regents Way.B02	107	BUILT	Wall	8	3	14.9
	CLPle02 The Esplanade to Regents Way.N01	108	NATURAL	Vegetated - Tree Lined	18	18	19.5
	CLPle02 The Esplanade to Regents Way.B01	109	BUILT	Revetment	13	13	105.6
	CLPle01 The Esplanade to Beamish Ave.N01	110	NATURAL	Vegetated - Sedges	12	12	251.0
COM 14. Gabbijee - Thomas Middleton through to Bateman Park	CLBre02 Thomas Middleton Park.N03	111	NATURAL	Sedimentary - Beach	6	1	49.6
	CLBre02 Thomas Middleton Park.N02	112	NATURAL	Vegetated - Tree Lined	12	12	132.1
	CLBre02 Thomas Middleton Park.N01	113	NATURAL	Vegetated - Tree Lined	12	12	91.6
	CLBre01 Bateman Park.N01	114	NATURAL	Vegetated - Tree Lined	13	13	408.3

Appendix 4. Prioritisation of sites for Restoration 2025 – 2030.

GIS ID #	CoM ID#	Segment	Foreshore Segment Name	Location	Asset Description	Threat to Asset	OCI-L	Descriptors for Ranking of Asset	Ranking of Asset	Descriptors for Ranking of Threat	Ranking of Threat	Priority for Works	Management Solutions
TBD	COM 03	22	SLBic01 Point Walter East to Boat ramp and jetty.B06	Dyoondalup - Point Walter Foreshore Reserve through to Attadale Dog Beach	Limestone revetment has experienced degradation and the rocks are spread out into the water. Ramp has been undermined and grassy areas undercut. Asset has a high community value.	Energetic wave conditions, frequent access and trampling by public.	22	Active erosion is a high public safety issue, a recreational amenity, and a site visited by migratory bird species.	Very High	Further infrastructure degradation in the short term, safety hazard to public, likely impact on recreation in the area	Very High	Priority 1	Repair revetment as a temporary measure/ maintenance action. Reinstate or redesign as part of a strategic renewal project CAPEX works.
TBD	COM 07	44	SLApl07 Point Dundas Boardwalk to Jeff Joseph Reserve.N02	Moondaap - Majestic Cove and Point Dundas	Narrow eroded sandy shoreline with recently planted sedges in sections supporting sand retention. Gabion wall to the south is leaning towards beach but still stable. Grassy vegetation provides bank stability in some sections.	Energetic wave conditions; increase in mean water level; vegetation loss; sediment sink/source; seasonality; trampling; erosion 2-5m observed when measured 2015-2023.	19	Limited setback to path in south section (typ 1-3m), which has low elevation (1.2-1.3m AHD, susceptible to inundation). Path is highly used and connects to broader foreshore. Backed by high value private property.	High	Likely further loss of vegetation without dense sedge planting. Scarping and steep shoreline with loose sand after weed control can destabilise shore.	Very High	Priority 1	Path reinforcement / reconstruction and revegetation to remove weeds and establish thick sedges to buffer wave action and prevent sand loss. * Review gabion function / repair gabions.
TBD	COM 07	45	SLApl07 Point Dundas Boardwalk to Jeff Joseph Reserve.N01	Moondaap - Majestic Cove and Point Dundas	Rock revetment structures have been variably constructed to provide protection, with elevation and rock size increasing for smaller setbacks.	Energetic wave conditions; Increase in mean water level; Erosion due to structures.	19	Some segments with very limited setback; Path is highly used and connects to broader foreshore; Backed by high value private property (not assessed in consequence rating). Segments of low level revetment have been overtopped. Apparent pressure points have higher revetment & parts have been mortared.	Very High	Overtopping and further loss of sediment. Damage to the boardwalk.	High	Priority 1	Overtopped revetment may require raising; Mortared revetment requires frequent inspection. Boardwalk repairs required.
TBD	COM 08	49	SLApl06 Jeff Joseph Reserve.B02	Kooyagoordup - Jeff Joseph and the Strand	Shoreline eroding with erosion scarps adjacent to the jetty and landward of the baffles areas. Some uptake of revegetation, but evidence of overwash and scour is present along the foreshore.	Energetic wave conditions; Increase in mean water level	21	Loss of environmental and amenity value. Eroded 26m since 1995.	Very High	The energetic wave conditions will continue to cause vegetation loss within 1 - 2 years and threaten further losses landward if interim revegetation/bioengineering using dense sedges is not implemented to slow the progress of erosion.	Very High	Priority 1	Baffles provide minimal functionality - only a few shore parallel components remain; consider removal - consult with DBCA and the Marine engineer first. Apply a managed retreat approach, with revegetation landward of existing. Underprune Acacia to facilitate sedge establishment behind a low brushwall.
TBD	COM 10	61	SLApl02 Beach Rd to Coffee Point Reserve.N04	Gabbi Kowangulup - Coffee Point and Canning Beach Road	Loss of ~5m of foreshore since 2019 with loss of beach width and vegetation/trees at upstream and downstream ends. Erosion scarp at upstream end approx. 30cm with <1m buffer to path.	Increase in mean water level; vegetation loss.; informal access.	22	Path at risk of collapse; erosion scarp public hazard; loss of amenity and environmental value.	Very High	The scarp morphology and unconsolidated sediment alongside boat wake will cause site to erode further in the short term with potential to destabilise existing vegetation upstream.	Very High	Priority 1	Address erosion scarps. Consider the movement of the pathway landward. Bioengineering is possible with a small extension of the rock revetment next to the adjacent functional revetment upstream.
TBD	COM 10	63	SLApl01 Beach Rd to Coffee Point Reserve.B05	Gabbi Kowangulup - Coffee Point and Canning Beach Road	Scour to landward adjacent to path affecting quality of turf and public safety due to gaps behind existing (old) rock revetment,	Energetic wave conditions, sediment deficit, trampling	19	Unstable revetment and scour behind it are public risks and also affect the stability of the pathway.	High	Hazard to public safety and stability of the pathway due to further loss of sediment and rock movement.	Medium	Priority 2	Repair revetment in the short term and continue nourishment with coarse sand. Reinstate rock revetment to make congruent with the downstream section.
TBD	COM 10	64	SLApl01 Beach Rd to Coffee Point Reserve.B04	Gabbi Kowangulup - Coffee Point and Canning Beach Road	Prompt action required; holes to landward of rock toe/ revetment a public safety hazard; evidence of washout from overland flow; no vegetation; deterioration of grass where present and threat to path.	Increase in mean water level; energetic wave conditions; undercutting.	22	Public safety issue (unstable revetment a public safety issue); low amenity value and environmental value; threat to path and adjacent to road	Very High	Hazard to public safety and stability of the pathway due to further loss of sediment and rock movement.	High	Priority 1	Repairs to rock riprap required, including to address holes created by overwash (infill with coarse sand).Temporary measure until appropriate designs are developed.

GIS ID #	CoM ID#	Segment	Foreshore Segment Name	Location	Asset Description	Threat to Asset	OCI-L	Descriptors for Ranking of Asset	Ranking of Asset	Descriptors for Ranking of Threat	Ranking of Threat	Priority for Works	Management Solutions
TBD	COM 10	65	SLApl01 Beach Rd to Coffee Point Reserve.N02	Gabbi Kowangulup - Coffee Point and Canning Beach Road	Narrow band of sedge with limited coverage; destabilising processes by informal access (extra influence) impacting >50% of the alongshore length; erosion scarps. at W end tree undermined. GSC bags washed out; limited sedge and scouring around/behind	Increase in mean water level; vegetation loss, weeds, trampling	22	Erosion scarps a public safety issue; path at risk; sedge degraded and landward trees being undermined; overwash along entire segment	Very High	Hazard to public safety and stability of the pathway due to further loss of sediment and rock movement.	High	Priority 1	Managed foreshore migration (path movement landward); Widen vegetation buffer (to landward); Provide controlled access; Ensure sufficient setback from road. Maintain drains free from obstructing vegetation.
TBD	COM 10	67	SLApl01 Beach Rd to Coffee Point Reserve.N01	Gabbi Kowangulup - Coffee Point and Canning Beach Road	Loss of sedges along the length; extensive overwash, undercutting, erosion; pinch points with minor scarps; areas where veg width is less than 1m; grassed area adjacent to sedges, broken drain pipe at Moreau Mews and death of sedges to the south.	Increase in mean water level; trampling, adjacent development effects on groundwater, weeds.	22	Loss of environmental and amenity value; complete loss of sedge in some areas and degradation in others	Very High	Further loss of sedges is expected due to wave conditions at the upstream end of this segment in front of new development.	High	Priority 1	Managed foreshore migration; Widen vegetation buffer (to landward see actions 129 - 133); Provide controlled access; Ensure sufficient setback; Liaise with Water Corp regarding migration of sewer infrastructure.
TBD	COM 11	76	CLPle06 Apex Reserve to John XXIII Rowing Club.N04	Wagoorjup - The Esplanade North	11m segment; focal erosion at block wall/limestone revetment; limited sedge width (1-3m); sedge loss.	Increase in mean water level; SE wind waves; interruption of sediment transport; Structural failure	19	Eroding sedges proximal to hard infrastructure. Limited space.	High	Loss of sedges is highly likely due to water conditions and the hard structures up and downstream of the segment.	Very High	Priority 1	Consider infill and bioengineering.
TBD	COM 11	77	CLPle06 Apex Reserve to John XXIII Rowing Club.B04	Wagoorjup - The Esplanade North	Deformed lower exposed gabion baskets; render cracked; no loss of rocks yet and baskets intact but undermining present. Loss of sedges and undermining of a native paperbark tree.	Increase in mean water level; SE wind waves; interruption of sediment transport; Structural failure.	22	Upstream end undermined with flanking erosion and creates potential to destabilise stairs to foreshore; park bench and path - public safety risk.	Very High	Structure is already undermined and will continue to worsen particularly in summer.	High	Priority 1	Pack stones around gabion cages to reduce undermining. Plant large sedges. Plan for replacement of stairs with retreat at upstream end.
TBD	COM 11	80	CLPle06 Apex Reserve to John XXIII Rowing Club.N02	Wagoorjup - The Esplanade North	Vegetated with 80-100% cover. Upper bank erosion across the majority of the section with scarp <0.5m. Undermining of the trees adjacent to pathway.	Energetic wave conditions; Increase in mean water level; vegetation loss; drainage structures; flow over banks; trampling	19	Path w/ limited setback (<1 m in some sections) with undermined trees adjacent.	High	Wave conditions and variation in the MSL will cause further erosion particularly in a location adjacent to pathway.	Very High	Priority 1	Widen vegetation buffer(sedge); Consider stabilisation works or path edging (if path threatened); apply bioengineering / large sedge planting and renourishment landward in the interim. rock toe tree protection. Revisit the upstream gabion and the effect of this on the area immediately adjacent to devise the most appropriate response.
TBD	COM 11	82	CLPle06 Apex Reserve to John XXIII Rowing Club.N01	Wagoorjup - The Esplanade North	Narrow sedge/veg line, upper bank erosion near path. Downstream erosion due to revetment flanking.	Energetic wave conditions; Increase in mean water level; vegetation loss; drainage structures; flow over banks; trampling	19	Path with limited setback. Erosion at light pole at upstream end where there is limited setback to path <0.2m	High	Wave conditions and variation in the MSL will cause further erosion particularly in a location adjacent to pathway.	Very High	Priority 1	Repair mortared rock pitching adjacent to path. Widen vegetation buffer(sedge); Consider stabilisation works (extend revetment if path threatened/ path edging). This segment should be joined to segment 83.
TBD	COM 11	83	CLPle06 Apex Reserve to John XXIII Rowing Club.B01	Wagoorjup - The Esplanade North	Riprap rock with variable sizes/height, path protection.	Increase in mean water level; overbank flow.	19	Limited buffer and path beginning to be undermined for some sections;	High	Wave conditions and variation in the MSL will cause further erosion particularly around existing trees.	High	Priority 1	Protection to path level where erosion is observed (edging/bank stabilisation); Revegetate upper bank where possible. Repair tree protection nodes as a minimum.

GIS ID #	CoM ID#	Segment	Foreshore Segment Name	Location	Asset Description	Threat to Asset	OCI-L	Descriptors for Ranking of Asset	Ranking of Asset	Descriptors for Ranking of Threat	Ranking of Threat	Priority for Works	Management Solutions
TBD	**COM 11**	**84**	CLPle05 The Esplanade to Rookwood Street Jetty.N03	Wagoorjup - The Esplanade North	Narrow band of sedge with limited coverage [veg width 1-3m (i.e. single line of sedge and trees), with less coverage at downstream end. Greater coverage at upstream end.	Increase in mean water level; vegetation loss; overbank flow; Trampling; Drainage Structures	**19**	Downstream end, where sedges are sparse and mixed with a tree-lined bank, and erosion occurs downdrift of the drain. Narrow buffer to path.	**High**	Isolated pockets will be impacted in the short term by water level fluctuations and derelict drainage structures with a negative focused impact.	**High**	**Priority 1**	Widen Vegetation Buffer (increase sedge coverage); Consider stabilisation works and path edging; Retrofit drainage structure; Reduce overbank flow (focal)
TBD	**COM 11**	**85**	CLPle05 The Esplanade to Rookwood Street Jetty??	Wagoorjup - The Esplanade North	Rip-rap rock low in height at downstream end, with erosion evident to landward.	Increase in mean water level; Overbank flow	**19**	Path with extremely limited setback, with erosion of upper bank encroaching. Loss of vegetation and undermining of paperbarks	**High**	Very narrow space between path and the high water level.	**High**	**Priority 1**	Raise the low section of the rock rip rap, infill any eroded soil. Widen vegetation buffer (upper bank); Consider path stabilisation works (edging) if path cannot move before revegetation. In medium to long term consider moving pathway landward.
TBD	**COM 11**	**86**	CLPle05 The Esplanade to Rookwood Street Jetty.N02	Wagoorjup - The Esplanade North	Mixed tree-lined/revetment: Condition varies over the discrete sections; rock revetment section where erosion has encroached on path; drain and failed section of bioengineering (too far into the river). Local gaps in sedges in front of tree-lined shore.	Energetic Wave Conditions; Increase in mean water level; Vegetation Loss; Drainage Structures; Flow Over Banks; Trampling	**19**	Vegetation buffer is too narrow as well as the gap between the pathway and the high water mark. Rock rip rap is low in height. Undermining of vegetation is occurring as well as erosion.	**High**	Very narrow space between path and the high water level.	**High**	**Priority 1**	Widen Vegetation Buffer (increase sedge coverage); Consider stabilisation works or edging if path at risk; Managed foreshore migration (move path); Retrofit drainage; Reduce overbank flow (focal). Use brushwall or similar to downstream end closer to the shole edge and revegetate with large sedges/infill planting.
TBD	**COM 11**	**88**	CLPle05 The Esplanade to Rookwood Street Jetty.N02	Wagoorjup - The Esplanade North	Mixed sedge/revetment: Condition varies over the discrete sections. Sections of steep bank & narrow buffer to path including near 20m rock riprap, 120m south of downstream end & sedges in central section where recent backfill/coir installed due to focal bank undermining at tree.	Energetic Wave Conditions; Increase in mean water level; Vegetation Loss; Drainage Structures; Flow Over Banks; Trampling	**19**	Local gaps in sedges and path beginning to be undermined towards upstream end.	**High**	Very narrow space between path and the high water level and low height rock riprap causing overwash and sediment loss	**High**	**Priority 1**	Widen Vegetation Buffer (increase sedge coverage); Consider stabilisation works or edging if path at risk; Managed foreshore migration (move path); Retrofit drainage; Reduce overbank flow (focal)
TBD	**COM 11**	**89**	CLPle05 The Esplanade to Rookwood Street Jetty.N02	Wagoorjup - The Esplanade North	Mixed tree-lined/revetment: Condition varies over the discrete sections; rock revetment section where erosion has encroached on path; drain and failed section of bioengineering.	Energetic wave conditions; increase in mean water level; vegetation loss; drainage structures; flow over banks; trampling	**19**	Local gaps in sedges in front of tree-lined shore. Pathway too close to some sections of the shoreline.	**High**	Gaps in sedges are acting as focal points for erosion. Small areas adjacent to path	**Very High**	**Priority 1**	Widen Vegetation Buffer (increase sedge coverage); Consider stabilisation works or edging if path at risk; Managed foreshore migration (move path); Retrofit drainage; Reduce overbank flow (focal).
TBD	**COM 13**	**93**	CLPle03 Henry Bridge.B09	Wagoorjup - The Esplanade South	Northern extension from original structures (brushwall) is subject to flanking. Rock revetment. - low & poor retention/scarping. Void where drain removed, occupied by samphire.	Energetic wave conditions; increase in mean water level; drainage structures; sediment sink/source.	**22**	Local flanking, inadequate crest and lack of protection following drain removal. Negligible foreshore setback, putting dual use path at risk; vegetated section of foreshore has limited space.	**Very High**	High level of erosion due to temporary shoreline structures and scarping.	**Very High**	**Priority 1**	Address structure flanking; provide stabilisation for area with inadequate setback. Rebuild the revetment next to the drain
TBD	**COM 13**	**96**	CLPle03 Henry Bridge.B07	Wagoorjup - The Esplanade South	Widely graded limestone (~0.2-0.8m, some areas smaller) over geotextile; very low crest (DS); irregular armour face; limited embedment with exposed geotextile sections at toe & trees - some trees may collapse.	Energetic wave conditions; drainage structures; trampling	**19**	Path in close proximity to revetment along sections. Lack of understory (sedges) Eroded transition to he Jetty on the downstream side.	**High**	Trampling and energetic wave conditions alongside poor rock riprap placement will continue to erode shoreline - slightly wider buffer to path but negligible.	**High**	**Priority 1**	Managed foreshore migration (limited space); consider raising crest or path stabilisation works (edging); increase toe protection against undermining (local)

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TBD	**COM 13**	**97**	CLPle03 Henry Bridge.B06	Wagoorjup - The Esplanade South	Timber wall failure due to flanking caused by scarping ~0.8m, retreat ~3m, leaving narrow/steep buffer to path. Dense canopy of remnant *Melaleuca rhaphiophylla* trees. Non native trees also present - large. No understory beyond limited sedges right at water edge.	Energetic wave conditions; timber wall structure flanking.	**22**	Timber wall protects path - with failure at the narrowest point; does not connect to the adjacent upstream revetment.	**Very High**	Energetic wave conditions and flanking caused by existing timber structures will continue to degrade, therefore prompting the need for urgent work (timber wall is supporting bank landward.	**Very High**	**Priority 1**	Urgent work required. May require removal of the polar tree. Interim works to consider use of GSCs and rock toe until detail design developed. Seed advice of marine engineer for positioning of the GCS and or rock toe.
TBD	**COM 13**	**106**	CLPle02 The Esplanade to Regents Way.N01	Wagoorjup - The Esplanade South	Single tree line with >30% alongshore tree loss; erosion/undercutting; <5m buffer between trees/path; overwash; 2 broken drains on sandy beach. Overwash / scarping evident downstream.	Trampling and vegetation loss.	**18**	Broken drains public safety issue; amenity value of foreshore degraded; visible loss of trees, scarping, failing vegetation & overwash; threat to heavily used public path . Narrow buffer between eroding shoreline and path; loss of beach width	**High**	Small but adequate buffer form pathway. Scarped section most susceptible to erosion.	**Medium**	**Priority 2**	Managed foreshore migration; Expect retreat and increase resilience; widen vegetation buffer; renourish/ bioengineer scarping section where appropriate; provide controlled access; reduce overbank flow
TBD	**COM 13**	**108**	CLPle02 The Esplanade to Regents Way.N01	Wagoorjup - The Esplanade South	Single tree line with >30% alongshore tree loss; erosion/undercutting; <5m buffer between trees/path; overwash; 2 broken drains on sandy beach. Overwash / scarping evident.	No significant hazards identified.	**18**	Narrow buffer between eroding shoreline and path; loss of beach width, undermining of trees.	**High**	Trampling and water level changes will continue to undermine the bank and threaten pathway stability within 2-3 years.	**Medium**	**Priority 2**	Managed foreshore migration; Expect retreat and increase resilience; widen vegetation buffer.

Appendix 5. Review of 2019 Foreshore Restoration Strategy.

Item Number	General Recommendations (2014)	Comments (2019)	Comments (2025)
1	Implement the revised restoration strategy detailed in this report with a view to softening the impact of the urban form on the landscape and re-establish a natural environment. *	Attempts to re-establish a natural environment for the City's foreshore area have been made but a mix of hard and soft foreshore treatments is currently present.	While both soft and hard engineering solutions exists along the foreshore the City has predominantly implemented soft engineering solutions over the past 3 years, this process will be ongoing, however due to some areas containing key infrastructure like roads soft engineering is not possible . Wherever possible space is made on the upper embankment to promote green links and biodiversity.
2	Revegetate the foreshore with native species using local seed stock, where practicable, particularly for species that may have developed a level of salt tolerance. *	Revegetation has occurred in a number of locations along the foreshore, and is ongoing.	Revegetation is ongoing with planting works conducted annually.
3	Consider the presence of the Threatened Ecological Community 'Temperate and subtropical saltmarsh' along the foreshore and prioritise the revegetation of this community using appropriate species.	The patch of vegetation, south of the South of Perth Yacht Club, is considered likely to be the 'Temperate and subtropical saltmarsh community'. This remnant vegetation has some evidence of trampling however dense stands of *Juncus* spp. is inhibiting weed invasion. The City may want to consider a fence or some other sort of barrier to prevent trampling.	No action on this matter completed.
4	Continue to work in partnership with DBCA, formerly the Swan River Trust, to maintain and improve foreshore areas. *	The partnership between the DBCA and the City of Melville is ongoing and consultation was undertaken as part of this review.	DBCA and the City have established a strong partnership, especially as a result of establishing a dedicated Foreshore Officer.
5	Continue to delineate native vegetation from parkland by edge spraying to prevent grasses from invading native vegetation.* If possible, where new works are undertaken (works that include the provision of new footpaths) use the footpaths as a barrier between parkland and native vegetation to prevent grasses invading native vegetation.	Edge spraying is apparent in a number of areas along the foreshore. Other areas had substantial grass growth around rock revetments	While a number of areas still require attention, particularly in high traffic zones like Point Walter, there is a notable difference in controlling grasses inhabiting the space between the pathway and the riparian vegetation (rushes and sedges). High utilisation of the foreshore reserves poses issues for the teams to treat grasses and weeds via chemical methods during warm months (best time to target invasive turf grasses).
6	Provide for greater community involvement in the City of Melville restoration programmes.	The City has continued to support community action groups and maintained community involvement in restoration programs. A Friends of Bull Creek Catchment (FOBCC) group was formed and a Water Quality Improvement Plan (WQIP) for the Bull Creek Catchment.	The City is continuing to work collaboratively with local community groups, including new groups like the Friends of Applecross Foreshore. Partnerships were also developed with Landcare groups, including Wirambi Landcare.
7	Pursue funding sources to deal with Declared Plants and other highly invasive weeds on the Melville foreshore.	Some control of these species is apparent along the foreshore	Weed control is ongoing across the foreshore, however, a number of sites still contain declared weeds.
8	Undertake an assessment of the inundated/damaged drainage outlets along the foreshore to ensure flow rates are acceptable and implement remedial action where applicable. Consideration by the city should be made to ensure that all existing drainage outlets have suitable flow efficiency and are not contaminating the river. Depending on the results of such investigations, storm water treatment devices could be installed to remove contaminants from outflows before they reach the City's waterways..	Observation recorded as part of the 2019 survey.	Four new gross pollutant traps were installed along Blackwall Reach Parade; three along the Strand and one at Blue Gum Lake since 2019. A number of street drains remain open and can cause potential pollutant entry into the river.
9	Manage foreshore access to ensure traffic is directed away from sensitive areas and diverted to designated public access points. *	Fences, stairs and paths are installed throughout the Melville foreshore to manage traffic but trampling in areas of unrestricted access is still a problem.	Trampling is still a problem, however a number of foreshore sites have been fenced off and provide good protection with minimum visual impact.
10	Remove failed foreshore treatments along the foreshore that have become potential safety hazards.	Observation recorded as part of the 2019 survey. Some areas noted have not been removed, such as failed sandbags located -The Strand opposite #54A 	 This area has been rehabilitated, however additional areas are showing degradation - Refer to site specific report cards.

Item Number	General Recommendations (2014)	Comments (2019)	Comments (2025)
11	Continue to monitor weeds along the foreshore and update the weed list and mapping undertaken during the foreshore inventory in order to identify new weed species or new populations that may be able to be eradicated before they become fully established. Conduct future weed surveys in Spring to allow identification of greater numbers of weed species.	Weeds observation have been combined within vegetation survey.	Weed monitoring is ongoing and the maps produced with each revision of the FMP. Weeds are also monitored for individual sections of the foreshore undergoing restoration.
12	Review and audit these recommendations within five years of implementation of this report by the Melville City Council. *	This review is being undertaken five years after the 2014 GHD's 'Foreshore Restoration Strategy Review' report.	This review is being undertaken five years after the 2019 GHD's 'Foreshore Restoration Strategy Review' report (GHD, 2019a).
BC	Bull Creek		
BC1	Maintain ongoing weed control for invasive weeds, including Giant Reed, Pampas Grass, Japanese Pepper tee, Arum Lily, Blackberry, Lantana, Grape Vine etc. Follow-up weed control with revegetation (direct planting) in areas with extensive weed invasion (particularly adjacent to Spinaway Crescent)	Infestation of Arum Lily, Blackberry and bridal creeper has increased since 2014. Arum lily and blackberry are beginning to dominate mid stratum in sections of the southern extent of Bateman Park in VT2.Couch and Kikyu are also dominating. Weed eradication and management should be employed .	Japanese Pepper trees have been removed along the entire stretch of the Canning River – City conducts regular monitoring for regrowth and new seedlings and is following up with control as required. Infestation of other species recorded in 2014 has also reduced but species still persist.
BC2	Undertake repairs to the bitumen path through Bateman Park.	Tree roots have been repaired and no longer exposed. No undercutting of path that was noted in the 2019 survey.	 Tree roots are still present and growing through the bitumen path. Path needs repair.
BC3	Repair the damaged drainage outlet located at the path providing access to the river at Spinaway Crescent.	Does not appear to have occurred.	Drain headwall is new however the pipe behind is exposed (not buried fully) and sedges are growing in front of the drain - monitor to check if sedge trimming / removal is required to facilitate stormwater flows.
BC4	Assess usage and access to the boardwalk located within the wetlands at Bateman Park.	Two wooden planks are rotted and need replacement. Most of structure good condition	Four damaged planks, Minor splits and paint loss on handrails and surface corrosion on fixings (GHD, 2024)
CR	**Canning River**		
CR1	Restore areas experiencing erosion by obtaining funding and implementing the prioritised project; Medium Term Stabilisation of Foreshore from Canning Bridge to Mt Henry Bridge	The Canning River is exposed to high level erosive conditions and there has been limited success from the remedial actions proposed in the previous review.	Erosion is ongoing mainly as a result of increased water levels
CR2	Connect vegetated areas with infill planting of sedge species	Some control of these species is apparent along the foreshore; however more work is required.	Additional revegetation is required to provide a more resilient foreshore edge.
SoPYC	**South of Perth Yacht Club**		
SoPYC1	Investigate and restore areas experiencing erosion by obtaining funding and implementing the prioritised project; Maintenance and Management of Sinkholes and Pathway Subsidence from South Perth Yacht Club to Raffles Hotel	No comment as area will be managed by the Yacht Club.	Erosion is prominent at Coffee Reserve, and the Canning Beach Road foreshore shows signs of deterioration and some revetment collapse.
SoPYC2	Weed control of sedgelands and sedge planting	Does not appear to have occurred.	No evident change in weed management noted.
PHWB	**Point Heathcote and Waylen Bay**		
PHWB1	Infill planting at Point Heathcote following restoration works	Weed invasion from **Ehrharta* spp. (Veldt Grass) and other species is minimal in the revegetated area at Point Heathcote. Restoration works appear to have been successful with native recruits recorded.	Restoration works on the slope eroding and the synthetic fibre erosion matting (Grassroots fabric) is damaged / ripped and largely does not offer support. Surface water erosion present.

Item Number	General Recommendations (2014)	Comments (2019)	Comments (2025)
PHWB2	Weed control of Giant Reed infestations east of Point Heathcote	Weed control has not been undertaken. **Arundo donax* (Giant Reed) still dominates the area 	Giant reed was removed (mechanically) and sprayed. There is an ongoing management for regrowth.
PHWB3	Connect vegetation along The Strand and Jeff Joseph Reserve through revegetation	Does not appear to have taken place. Replacement of asset has been undertaken	Additional planting was conducted near Sea scout club, however the area is largely impacted by turf grasses such as Couch.
PHWB4	Maintain weed control within the areas of vegetation in good condition in Jeff Joseph Reserve	Some control work is apparent; however ongoing work is required.	Weed control is ongoing. Some improvements achieved, however further control of turf grasses particularly Couch, mature Canary palm and poplar trees is required.
PHWB5	Investigate the replenishment of rocks for the Applecross Jetty and the two groynes to the west.	Does not appear to have occurred. Small rocks have been displaced from wave conditions	As at 2019.
PHWB6	Restore areas experiencing erosion at Point Heathcote and Jeff Joseph Reserve by obtaining funding and implementing the prioritised projects; Point Heathcote Stabilisation and Jeff Joseph Foreshore Restoration.	The wetland area behind the tennis courts is now stable and in good health however the grass verge line to the east is experiencing erosion issues. Some areas are experiencing significant trampling and undercutting of pathway.	Path was realigned in October 2021 increasing space between the river and the path. Vegetation and erosion have not significantly increased since 2019.
MB	**Melville Beach**		
MB1	Perform maintenance and repairs to the three sets of coastal stairs which are becoming inundated with sediment and plant waste.	Does not appear to have occurred. - TBC Sediment and plant matter building up. Vegetation buildup and undermining the stairs	Some maintenance was conducted. Vegetation buildup is seasonal.
MB2	Connect fringing vegetated areas with infill planting of sedge species	Does not appear to have occurred.	Works ongoing and a new restoration project completed in 2024.
MB3	Assess/monitor/repair the footpath opposite number 97 Melville Beach Road which is being significantly raised by a tree's root network.	Have been repaired.	No change
MB4	Weed control of Giant Reed infestations south of Point Dundas	Does not appear to have occurred.	Removed and replaced with native vegetation.
PW	**Point Walter**		
PW1	Monitor and maintain the recent restoration work.	Native vegetation and re-vegetation area - already fenced and management works evident	Monitoring ongoing. Fence still in place.
PW2	Monitor the erosion occurring at the eastern boat ramp and implement stabilisation measures as necessary.	Point Walter Reserve has undergone a transformation to reduce environmental impacts such as erosion, vegetation loss and weed invasion as well as an upgrade to recreational facilities, however there are some erosion causing instability at Bush Forever Site 331. - TBC	Erosion is ongoing mainly as a result of increased water levels
BR	**Blackwall Reach**		
BR1	Restore areas experiencing erosion by obtaining funding and implementing the prioritised project; Bicton Foreshore Restoration.	Some control work is apparent; however more work is required. This will be an ongoing management measure. The foreshore area is regularly used for recreation and is presenting manageable safety hazard -TBC.	The erosion control works were completed on the lower sections of Blackwall Reach / Bicton area with revetment installation and stair construction,. The erosion to the north, adjacent to Poojnt Walter is ongoing and there is evidence of sedge planting as well as coir log installation that failed to establish good cover.
BR2	Investigate public access through the bushland by undertaking the prioritised project requiring additional investigations; Blackwall Reach Planning Advice.	Does not appear to have occurred in 2019. - TBC	While the project is yet to occur due to unsuccessful finding grants thus far, the foreshore management team has installed ttemporary revegetation fencing in some areas to reduce the number of informal tracks and 'guide' people through the bush area rather than trampling throughout
BR3	Maintain ongoing weed management for invasive weeds	Sedgebeds look to have been revegetated and are in Very good condition.	Weed control is ongoing and shows good progress.

Appendix 6. Foreshore Flora and Vegetation Lists and Descriptions (after NAMS, 2024).

Excerpted from NAMS (2024)

The complete flora list for the site is provided in the table below, with flora listed by family. *Denotes introduced species and # denotes species that are native to Western Australia but not to this local region.

Family	Scientific Name	Common Name	Declared Pest and/or Weed of National Significance
Agapanthaceae	**Agapanthus praecox*		
Aizoaceae	**Carpobrotus edulis*	Hottentot Fig	
Aizoaceae	**Tetragonia decumbens*	Sea Spinach	
Aizoaceae	**Tetragonia tetragonoides*	New Zealand Spinach	
Alliaceae	**Nothoscordum gracile*		
Amaranthaceae	*Ptilotus polystachyus*	Prince of Wales Feather	
Anacardiaceae	**Schinus terebinthifolia*		
Anarthriaceae	*Lyginia imberbis*		
Apiaceae	*Apium prostratum*	Sea Celery	
Apiaceae	*Centella asiatica*	Centella	
Apocynaceae	**Asclepias curassavica*	Redhead Cottonbush	
Apocynaceae	**Nerium oleander*		
Apocynaceae	*Alyxia buxifolia*	Dysentery Bush	
Araceae	**Philodendron* sp.		
Araceae	**Thaumatophyllum bipinnatifidum*	Split-Leaf Philodendron	
Araceae	**Zantedeschia aethiopica*	Arum Lily	DP
Araliaceae	**Hedera helix*		
Araliaceae	*Trachymene coerulea*	Blue Lace Flower	
Araliaceae	*Trachymene pilosa*	Native Parsnip	
Araucariaceae	**Araucaria heterophylla*	Norfolk pine	
Arecaceae	**Phoenix canariensis*		
Arecaceae	**Phoenix dactylifera*	Date Palm	
Arecaceae	**Syagrus romanzoffiana*	Cocos Palm	
Arecaceae	**Washingtonia filifera*		
Asparagaceae	**Agave americana*		
Asparagaceae	**Asparagus asparagoides*	Bridal Creeper	DP, WoNS
Asparagaceae	**Lachenalia reflexa*		
Asparagaceae	**Lomandra longifolia*		
Asparagaceae	*Acanthocarpus preissii*		
Asparagaceae	*Lomandra caespitosa*	Tufted Mat Rush	
Asparagaceae	*Lomandra maritima*	Maritime Mat Rush	
Asparagaceae	*Thysanotus arenarius*	Sand-dune Fringed Lily	
Asparagaceae	*Thysanotus manglesianus*	Mangles' Fringed Lily	
Asphodelaceae	**Aloe vera*		
Asphodelaceae	**Asphodelus fistulosus*	Onion Weed	
Asphodelaceae	**Trachyandra divaricata*		
Asteraceae	**Arctotheca calendula*	Cape Weed	
Asteraceae	**Arctotis stoechadifolia*	White Arctotis	
Asteraceae	**Bidens pilosa*	Cobbler's Pegs	
Asteraceae	**Cotula coronopifolia*	Waterbuttons	

Family	Scientific Name	Common Name	Declared Pest and/or Weed of National Significance
Asteraceae	**Cotula turbinata*	Funnel Weed	
Asteraceae	**Erigeron bonariensis*		
Asteraceae	**Erigeron sumatrensis*		
Asteraceae	**Gamochaeta calviceps*		
Asteraceae	**Gazania linearis*		
Asteraceae	**Hypochaeris glabra*	Smooth Cats-ear	
Asteraceae	**Hypochaeris radicata*	Flat Weed	
Asteraceae	**Lactuca serriola*	Prickly Lettuce	
Asteraceae	**Leontodon rhagadioloides*	Cretan Weed	
Asteraceae	**Osteospermum ecklonis*		
Asteraceae	**Pseudognaphalium luteoalbum*	Jersey Cudweed	
Asteraceae	**Reichardia tingitana*	False Sowthistle	
Asteraceae	**Senecio condylus*	Perth Groundsel	
Asteraceae	**Senecio vulgaris*	Common Groundsel	
Asteraceae	**Sonchus asper*	Rough Sowthistle	
Asteraceae	**Sonchus oleraceus*	Common Sowthistle	
Asteraceae	**Symphyotrichum squamatum*	Bushy Starwort	
Asteraceae	**Urospermum picroides*	False Hawkbit	
Asteraceae	**Ursinia anthemoides*	Ursinia	
Asteraceae	*Cotula australis*	Common Cotula	
Asteraceae	*Leucophyta brownii*		
Asteraceae	*Olearia axillaris*	Coastal Daisybush	
Basellaceae	**Anredera cordifolia*		
Bignoniaceae	**Catalpa bignonioides*		
Bignoniaceae	**Tecoma stans*		
Boraginaceae	**Heliotropium curassavicum*	Smooth Heliotrope	
Brassicaceae	**Brassica tournefortii*	Mediterranean Turnip	
Brassicaceae	**Cakile maritima*	Sea Rocket	
Brassicaceae	**Raphanus raphanistrum*	Wild Radish	
Brassicaceae	**Rorippa nasturtium-aquaticum*	Watercress	
Campanulaceae	**Monopsis debilis*		
Campanulaceae	**Wahlenbergia capensis*	Cape Bluebell	
Campanulaceae	**Wahlenbergia preissii*		
Campanulaceae	*Lobelia anceps*	Angled Lobelia	
Cannabaceae	**Celtis occidentalis*		
Caprifoliaceae	**Centranthus macrosiphon*		
Caryophyllaceae	**Cerastium glomeratum*	Mouse Ear Chickweed	
Caryophyllaceae	**Petrorhagia dubia*		
Caryophyllaceae	**Polycarpon tetraphyllum*	Fourleaf Allseed	
Caryophyllaceae	**Silene gallica*	French Catchfly	
Casuarinaceae	**Casuarina cunninghamiana*		
Casuarinaceae	**Casuarina glauca*		
Casuarinaceae	*Allocasuarina fraseriana*	Sheoak	
Casuarinaceae	*Allocasuarina humilis*	Dwarf Sheoak	
Casuarinaceae	*Casuarina obesa*	Swamp Sheoak	
Chenopodiaceae	**Atriplex prostrata*	Hastate Orache	

Family	Scientific Name	Common Name	Declared Pest and/or Weed of National Significance
Chenopodiaceae	**Chenopodium album*	Fat Hen	
Chenopodiaceae	*Atriplex cinerea*	Grey Saltbush	
Chenopodiaceae	*Atriplex hypoleuca*		
Chenopodiaceae	*Atriplex nummularia*	Old Man Saltbush	
Chenopodiaceae	*Enchylaena tomentosa*	Barrier Saltbush	
Chenopodiaceae	*Rhagodia baccata*	Berry Saltbush	
Chenopodiaceae	*Salicornia quinqueflora*	Beaded Samphire	
Chenopodiaceae	*Suaeda australis*	Seablite	
Chenopodiaceae	*Tecticornia halocnemoides*	Shrubby Samphire	
Colchicaceae	*Burchardia congesta*	Milkmaids	
Convolvulaceae	**Ipomoea indica*	Morning Glory	
Crassulaceae	**Crassula alata*		
Crassulaceae	**Crassula glomerata*		
Cupressaceae	**Cupressus sempervirens*		
Cupressaceae	**Juniperus conferta*	Japanese Shore Juniper	
Cupressaceae	*Callitris preissii*	Rottenest Island Pine	
Cupressaceae	*Callitris pyramidalis*	Swamp cypress	
Cyperaceae	**Carex divisa*	Divided Sedge	
Cyperaceae	**Cyperus congestus*	Dense Flat-sedge	
Cyperaceae	**Cyperus involucratus*		
Cyperaceae	**Cyperus tenuiflorus*	Scaly Sedge	
Cyperaceae	**Ficinia marginata*	Coarse Club Rush	
Cyperaceae	*Bolboschoenus caldwellii*	Marsh Club-rush	
Cyperaceae	*Cyperus gymnocaulos*	Spiny Flat-sedge	
Cyperaceae	*Ficinia nodosa*	Knotted Club Rush	
Cyperaceae	*Gahnia decomposita*		
Cyperaceae	*Gahnia trifida*	Coast Saw-sedge	
Cyperaceae	*Lepidosperma calcicola*		
Cyperaceae	*Lepidosperma gladiatum*	Coast Sword-sedge	
Cyperaceae	*Lepidosperma longitudinale*	Pithy Sword-sedge	
Cyperaceae	*Lepidosperma squamatum*		
Cyperaceae	*Machaerina articulata*	Jointed Rush	
Cyperaceae	*Machaerina juncea*	Bare Twigrush	
Cyperaceae	*Mesomelaena pseudostygia*	Semaphore Sedge	
Cyperaceae	*Schoenoplectus tabernaemontani*	Lake Club-rush	
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	
Dilleniaceae	*Hibbertia cuneiformis*	Cutleaf Hibbertia	
Dilleniaceae	*Hibbertia racemosa*	Stalked Guinea Flower	
Dilleniaceae	*Hibbertia scandens*	Snake Vine	
Euphorbiaceae	**Euphorbia maculata*		
Euphorbiaceae	**Euphorbia peplus*	Petty Spurge	
Euphorbiaceae	**Euphorbia terracina*	Geraldton Carnation Weed	
Euphorbiaceae	**Ricinus communis*	Castor Oil Plant	
Euphorbiaceae	*Ricinocarpos glaucus*		
Fabaceae	**Acacia longifolia*		
Fabaceae	**Bauhinia acuminata*	White orchid-tree	
Fabaceae	**Ceratonia siliqua*		

Family	Scientific Name	Common Name	Declared Pest and/or Weed of National Significance
Fabaceae	**Dipogon lignosus*	Dolichos Pea	
Fabaceae	**Erythrina × sykesii*		
Fabaceae	**Lotus subbiflorus*		
Fabaceae	**Lupinus angustifolius*	Narrowleaf Lupin	
Fabaceae	**Lupinus cosentinii*		
Fabaceae	**Medicago laciniata*	Cutleaf Medic	
Fabaceae	**Medicago polymorpha*	Burr Medic	
Fabaceae	**Melilotus indicus*		
Fabaceae	**Quercus suber*	cork oak	
Fabaceae	**Trifolium angustifolium*	Narrowleaf Clover	
Fabaceae	**Trifolium arvense*	Hare's Foot Clover	
Fabaceae	**Trifolium campestre*	Hop Clover	
Fabaceae	**Trifolium tomentosum*	Woolly Clover	
Fabaceae	**Vicia benghalensis*	Purple Vetch	
Fabaceae	**Vicia hirsuta*	Hairy Vetch	
Fabaceae	**Vicia sativa*	Common Vetch	
Fabaceae	*Acacia cochlearis*	Rigid Wattle	
Fabaceae	*Acacia cyclops*	Coastal Wattle	
Fabaceae	*Acacia pulchella*	Prickly Moses	
Fabaceae	*Acacia rostellifera*	Summer-Scented Wattle	
Fabaceae	*Acacia saligna*	Orange Wattle	
Fabaceae	*Acacia xanthina*	White-stemmed Wattle	
Fabaceae	*Daviesia divaricata*	Marno	
Fabaceae	*Hardenbergia comptoniana*	Native Wisteria	
Fabaceae	*Jacksonia furcellata*	Grey Stinkwood	
Fabaceae	*Jacksonia sternbergiana*	Stinkwood	
Fabaceae	*Kennedia prostrata*	Scarlet Runner	
Fabaceae	*Templetonia retusa*	Cockies Tongues	
Fabaceae	*Viminaria juncea*	Swishbush	
Frankeniaceae	*Frankenia pauciflora*	Seaheath	
Geraniaceae	**Erodium botrys*	Long Storksbill	
Geraniaceae	**Pelargonium capitatum*	Rose Pelargonium	
Goodeniaceae	*Lechenaultia linarioides*	Yellow Leschenaultia	
Goodeniaceae	*Scaevola aemula*	Fairy Fan-flower	
Goodeniaceae	*Scaevola crassifolia*	Thick-leaved Fan-flower	
Goodeniaceae	*Scaevola nitida*	Shining Fanflower	
Goodeniaceae	*Scaevola thesioides*		
Haemodoraceae	*Anigozanthos flavidus*	Tall Kangaroo Paw	
Haemodoraceae	*Conostylis aculeata*	Prickly Conostylis	
Haemodoraceae	*Conostylis candicans*	Grey Cottonhead	
Hemerocallidaceae	*Dianella revoluta*	Flax Lily	
Hemerocallidaceae	*Tricoryne elatior*	Yellow Autumn Lily	
Iridaceae	**Ferraria crispa*	Black Flag	
Iridaceae	**Freesia leichtlinii* subsp. *alba* × *leichtlinii* subsp. *leichtlinii*		
Iridaceae	**Gladiolus angustus*	Long Tubed Painted Lady	
Iridaceae	**Gladiolus caryophyllaceus*	Wild Gladiolus	
Iridaceae	**Gladiolus undulatus*	Wild Gladiolus	

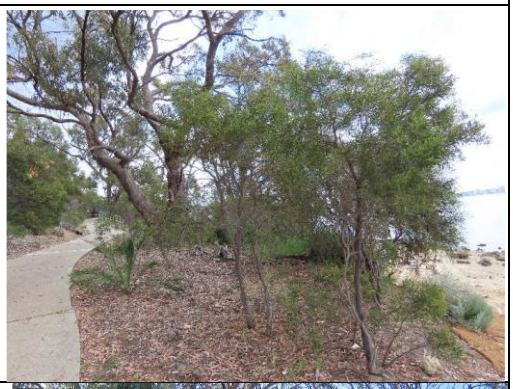
Family	Scientific Name	Common Name	Declared Pest and/or Weed of National Significance
Iridaceae	**Ixia paniculata*		
Iridaceae	**Moraea flaccida*	One-leaf Cape Tulip	DP, WoNS
Iridaceae	**Romulea rosea*	Guildford Grass	
Iridaceae	**Watsonia meriana* var. *bulbillifera*	Bugle Lily	
Iridaceae	*Patersonia occidentalis*	Purple Flag	
Juncaceae	**Juncus acutus*	Spiny Rush	
Juncaceae	**Juncus bufonius*	Toad Rush	
Juncaceae	*Juncus kraussii*	Sea Rush	
Juncaceae	*Juncus pallidus*	Pale Rush	
Lamiaceae	**Lavandula stoechas*	Italian Lavender	
Lamiaceae	*Hemiandra pungens*	Snakebush	
Lauraceae	*Cassytha glabella*	Tangled Dodder Laurel	
Loranthaceae	*Amyema linophylla*		
Loranthaceae	*Amyema miquelii*	Stalked Mistletoe	
Lythraceae	**Lythrum hyssopifolia*	Lesser Loosestrife	
Magnoliaceae	**Magnolia grandiflora*		
Malvaceae	**Brachychiton acerifolius*		
Malvaceae	**Brachychiton* sp.		
Malvaceae	**Malva parviflora*	Marshmallow	
Malvaceae	**Malva pseudolavatera*		
Malvaceae	*Alyogyne huegelii*	Lilac Hibiscus	
Meliaceae	**Melia azedarach*	White Cedar	
Moraceae	**Ficus carica*	Common Fig	
Moraceae	**Ficus macrophylla*		
Moraceae	**Ficus microcarpa* var. *hillii*		
Myrtaceae	*#Corymbia ficifolia*	Red-flowering Gum	
Myrtaceae	*#Eucalyptus camaldulensis*	River Gum	
Myrtaceae	*#Eucalyptus spathulata* subsp. *spathulata*	Swamp Mallet	
Myrtaceae	*#Eucalyptus torquata*	Coral Gum	
Myrtaceae	*#Eucalyptus utilis*	Coastal Moort	
Myrtaceae	*#Eucalyptus victrix*		
Myrtaceae	*#Eucalyptus websteriana*	Webster's Mallee	
Myrtaceae	*#Melaleuca lanceolata*	Rottnest Teatree	
Myrtaceae	**Angophora costata*		
Myrtaceae	**Callistemon citrinus*		
Myrtaceae	**Chamelaucium uncinatum*	Geraldton Wax	
Myrtaceae	**Corymbia citriodora*		
Myrtaceae	**Corymbia maculata*		
Myrtaceae	**Eucalyptus botryoides*		
Myrtaceae	**Eucalyptus grandis*		
Myrtaceae	**Eucalyptus leucoxylon*		
Myrtaceae	**Eucalyptus petiolaris*		
Myrtaceae	**Eucalyptus sideroxylon*		
Myrtaceae	**Gaudium laevigatum*	Coastal Teatree	
Myrtaceae	**Kunzea baxteri*	Baxter's Kunzea	
Myrtaceae	**Melaleuca nesophila*	Mindiyed	

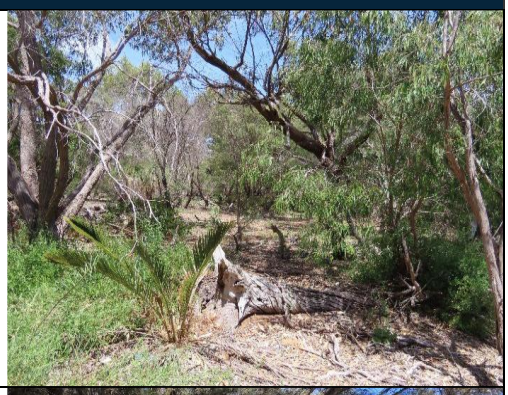
Family	Scientific Name	Common Name	Declared Pest and/or Weed of National Significance
Myrtaceae	**Melaleuca quinquenervia*		
Myrtaceae	**Melaleuca quinquenervia*		
Myrtaceae	**Melaleuca styphelioides*		
Myrtaceae	**Melaleuca viminalis*		
Myrtaceae	*Agonis flexuosa*	Peppermint	
Myrtaceae	*Calothamnus quadrifidus*	One-sided Bottlebrush	
Myrtaceae	*Calothamnus quadrifidus* subsp. *homalophyllus*	Murchison Clawflower	
Myrtaceae	*Calothamnus rupestris*	Mouse Ears	
Myrtaceae	*Corymbia calophylla*	Marri	
Myrtaceae	*Eremaea pauciflora*		
Myrtaceae	*Eucalyptus gomphocephala*	Tuart	
Myrtaceae	*Eucalyptus marginata*	Jarrah	
Myrtaceae	*Eucalyptus rudis*	Flooded Gum	
Myrtaceae	*Kunzea glabrescens*	Spearwood	
Myrtaceae	*Melaleuca cuticularis*	Saltwater Paperbark	
Myrtaceae	*Melaleuca huegelii*	Chenille Honeymyrtle	
Myrtaceae	*Melaleuca lateritia*	Robin Redbreast Bush	
Myrtaceae	*Melaleuca preissiana*	Modong	
Myrtaceae	*Melaleuca rhaphiophylla*	Swamp Paperbark	
Myrtaceae	*Melaleuca systena*	Coastal Honeymyrtle	
Myrtaceae	*Melaleuca viminea*	Mohan	
Oleaceae	**Olea europaea*	Olive	
Onagraceae	**Oenothera drummondii*	Beach Evening Primrose	
Onagraceae	**Oenothera stricta*	Common Evening Primrose	
Orchidaceae	**Disa bracteata*	South African Orchid	
Orchidaceae	*Caladenia flava*	Cowslip Orchid	
Orchidaceae	*Microtis media*	Tall Mignonette Orchid	
Orobanchaceae	**Orobanche minor*	Lesser Broomrape	
Oxalidaceae	**Oxalis pes-caprae*	Soursob	
Papaveraceae	**Fumaria capreolata*	Whiteflower Fumitory	
Papaveraceae	**Papaver somniferum*	Opium Poppy	
Pinaceae	**Pinus pinaster*	Pinaster Pine	
Pinaceae	**Pinus radiata*	Radiata Pine	
Platanaceae	**Platanus × hispanica*	London Plane	
Plumbaginaceae	**Limonium hyblaeum*		
Poaceae	**Aira caryophyllea*	Silvery Hairgrass	
Poaceae	**Aira cupaniana*	Silvery Hairgrass	
Poaceae	**Arundo donax*	Giant Reed	
Poaceae	**Avena barbata*	Bearded Oat	
Poaceae	**Briza maxima*	Blowfly Grass	
Poaceae	**Briza minor*	Shivery Grass	
Poaceae	**Bromus diandrus*	Great Brome	
Poaceae	**Bromus hordeaceus*	Soft Brome	
Poaceae	**Catapodium rigidum*	Rigid Fescue	
Poaceae	**Cenchrus clandestinus*	Kikuyu grass	
Poaceae	**Cenchrus setaceus*	Fountain Grass	

Family	Scientific Name	Common Name	Declared Pest and/or Weed of National Significance
Poaceae	**Cortaderia selloana*	Pampas Grass	
Poaceae	**Cynodon dactylon*	Couch	
Poaceae	**Ehrharta calycina*	Perennial Veldt Grass	
Poaceae	**Ehrharta longiflora*	Annual Veldt Grass	
Poaceae	**Eragrostis curvula*	African Lovegrass	
Poaceae	**Hordeum leporinum*	Barley Grass	
Poaceae	**Lagurus ovatus*	Hare's Tail Grass	
Poaceae	**Lolium rigidum*	Wimmera Ryegrass	
Poaceae	**Parapholis incurva*	Coast Barbgrass	
Poaceae	**Paspalum dilatatum*		
Poaceae	**Poa annua*	Winter Grass	
Poaceae	**Polypogon monspeliensis*	Annual Beardgrass	
Poaceae	**Rostraria cristata*		
Poaceae	**Stenotaphrum secundatum*	Buffalo Grass	
Poaceae	**Vulpia myuros*	Rat's Tail Fescue	
Poaceae	*Austrostipa elegantissima*		
Poaceae	*Poa poiformis*	Coastal Poa	
Poaceae	*Spinifex longifolius*	Beach Spinifex	
Poaceae	*Sporobolus virginicus*	Marine Couch	
Polygalaceae	**Polygala myrtifolia*	Myrtleleaf Milkwort	
Polygalaceae	*Comesperma integerrimum*		
Polygonaceae	**Rumex conglomeratus*	Clustered Dock	
Polygonaceae	**Rumex crispus*	Curled Dock	
Polygonaceae	*Muehlenbeckia adpressa*	Climbing Lignum	
Primulaceae	**Lysimachia arvensis*	Pimpernel	
Primulaceae	*Samolus junceus*		
Primulaceae	*Samolus repens*	Creeping Brookweed	
Proteaceae	*Banksia attenuata*	Slender Banksia	
Proteaceae	*Banksia littoralis*	Swamp Banksia	
Proteaceae	*Banksia menziesii*	Firewood Banksia	
Proteaceae	*Banksia sessilis*	Parrot Bush	
Proteaceae	*Grevillea crithmifolia*		
Proteaceae	*Grevillea obtusifolia*	Obtuse Leaved Grevillea	
Proteaceae	*Grevillea preissii*		
Proteaceae	*Grevillea thelemanniana*	Spider Net Grevillea	
Proteaceae	*Grevillea vestita*		
Proteaceae	*Hakea prostrata*	Harsh Hakea	
Proteaceae	*Hakea trifurcata*	Two-leaf Hakea	
Proteaceae	*Hakea varia*	Variable-leaved Hakea	
Proteaceae	*Petrophile macrostachya*		
Proteaceae	*Stirlingia latifolia*	Blueboy	
Ranunculaceae	*Clematis linearifolia*	Slender Clematis	
Rhamnaceae	*Spyridium globulosum*	Basket Bush	
Rosaceae	**Rubus ulmifolius*		DP
Rubiaceae	**Galium murale*	Small Goosegrass	
Rutaceae	**Citrus* sp.		
Rutaceae	**Citrus x aurantiifolia*	Key Lime	
Salicaceae	**Populus nigra*		

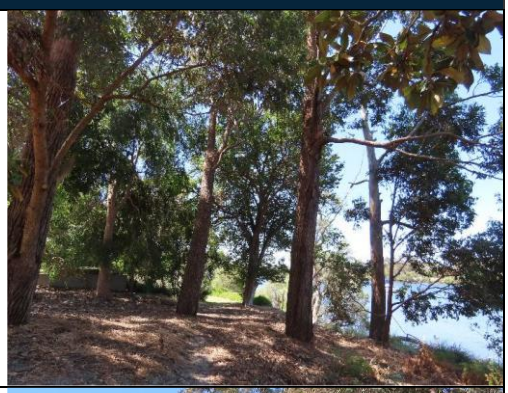
Family	Scientific Name	Common Name	Declared Pest and/or Weed of National Significance
Salicaceae	**Populus x canadensis*		
Salicaceae	**Salix babylonica*		
Sapindaceae	*Dodonaea aptera*	Coast Hop-bush	
Sapindaceae	*Dodonaea hackettiana*	Hackett's Hopbush	
Scrophulariaceae	**Dischisma capitatum*	Woolly-headed Dischisma	
Scrophulariaceae	*Eremophila glabra*	Tar Bush	
Scrophulariaceae	*Myoporum insulare*	Blueberry Tree	
Solanaceae	**Solanum lycopersicum*	Tomato	
Solanaceae	**Solanum nigrum*	Black Berry Nightshade	
Solanaceae	*Anthocercis ilicifolia*	Holly-leaf Tailflower	
Strelitziaceae	**Strelitzia reginae*		
Tamaricaceae	**Tamarix aphylla*	Athel Tree	DP, WoNS
Thymelaeaceae	*Pimelea ferruginea*		
Tropaeolaceae	**Tropaeolum majus*	Garden Nasturtium	
Typhaceae	**Typha orientalis*	Bulrush	
Typhaceae	*Typha domingensis*	Bulrush	
Ulmaceae	**Ulmus parvifolia*		
Urticaceae	*Parietaria cardiostegia*	Native Pellitory	
Verbenaceae	**Citharexylum spinosum*		
Verbenaceae	**Lantana camara*	Common Lantana	DP, WoNS
Violaceae	*Pigea calycina*	Wild Violet	
Vitaceae	**Parthenocissus quinquefolia*		
Vitaceae	**Vitis* sp.		
Vitaceae	**Vitis vinifera*		
Xanthorrhoeaceae	*Xanthorrhoea brunonis*		
Xanthorrhoeaceae	*Xanthorrhoea preissii*	Grass tree	
Zamiaceae	*Macrozamia riedlei*	Zamia	
Total number of weeds			204
Non-indigenous natives			8
Total number of natives (including non-indigenous)			135
Total species richness			347
Weeds % present of total species			59%
Indigenous species %			39%

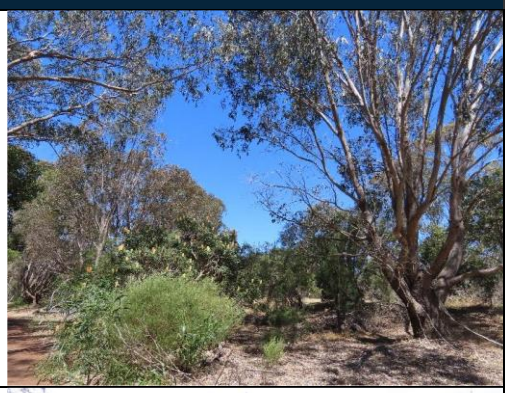
Vegetation Types recorded for the foreshore area (NAMS, 2024)

Vegetation Types	Description	Photograph
Acacia rostellifera **shrubland (ArS)**	A shrubland of *Acacia rostellifera* with scattered mixed native shrubs.	
Acacia rostellifera, Acacia saligna **and** ***Jacksonia sternbergiana*** **shrubland (ArAsJsS)**	A shrubland of *Acacia rostellifera*, *Acacia saligna* and *Jacksonia sternbergiana* over mixed closed sedgeland (including *Juncus kraussii*, *Lepidosperma gladiatum*, *Ficinia nodosa*, *Machaerina juncea*) over mixed native and introduced herbs and grasses.	
Acacia saligna **shrubland (AsS)**	A shrubland of *Acacia saligna* over *Ficinia nodosa* open sedgeland over mixed native and introduced herbs and grasses.	
Agonis flexuosa **woodland (AfW)**	A woodland of *Agonis flexuosa*.	

Vegetation Types	Description	Photograph
***Agonis flexuosa* and *Eucalyptus gomphocephala* woodland (AfEgW)**	A woodland of *Agonis flexuosa* and *Eucalyptus gomphocephala* with scattered *Banksia sessilis* over *Rhagodia baccata* and mixed introduced herbs and grasses.	
***Casuarina obesa* woodland (CoW)**	A woodland of *Casuarina obesa* over mixed native sedgeland.	
***Casuarina obesa* and *Agonis flexuosa* woodland (CoAfW)**	A woodland of *Casuarina obesa* and *Agonis flexuosa* over mixed coastal shrubland over mixed sedgeland.	
***Casuarina obesa* and *Melaleuca rhaphiophylla* woodland (CoMrW)**	A woodland of *Casuarina obesa* and *Melaleuca rhaphiophylla* over *Juncus kraussii* and *Ficinia nodosa* sedgeland.	

Vegetation Types	Description	Photograph
***Corymbia calophylla* woodland (CcW)**	A woodland of Corymbia calophylla over scattered mixed shrubland over introduced herbs and grasses	
***Corymbia calophylla, Melaleuca preissiana* and *Banksia attenuata* woodland (CcMpBaW)**	A woodland of *Corymbia calophylla*, *Melaleuca preissiana* and *Banksia attenuata* over introduced herbs and grasses.	
***Eucalyptus gomphocephala* woodland (EgW)**	A woodland of *Eucalyptus gomphocephala* over *Banksia sessilis*, *Jacksonia furcellata* and *Macrozamia riedlei* shrubland over mixed introduced herbs and grasses.	
***Eucalyptus gomphocephala* and *Casuarina obesa* woodland (EgCoW)**	A woodland of *Eucalyptus gomphocephala* and *Casuarina obesa* with scattered *Agonis flexuosa* over *Lepidosperma gladiatum*, *Machaerina juncea* and *Juncus kraussii* sedgeland.	

Vegetation Types	Description	Photograph
***Eucalyptus grandis* woodland (EgrW)**	A woodland of **Eucalyptus grandis* over mixed introduced grasses.	
***Eucalyptus rudis* and *Casuarina obesa* woodland (ErCoW)**	A woodland of *Eucalyptus rudis* and *Casuarina obesa* over mixed introduced herbs and grasses.	
***Eucalyptus rudis* and *Melaleuca rhaphiophylla* woodland (ErMrW)**	A woodland of *Eucalyptus rudis* and *Melaleuca rhaphiophylla* over mixed sedgeland over mixed introduced herbs and grasses.	
***Eucalyptus rudis* woodland (ErW)**	A woodland of *Eucalyptus rudis* over mixed shrubland over mixed sedgeland over mixed introduced herbs and grasses.	

Vegetation Types	Description	Photograph
***Eucalyptus rudis*, *Banksia attenuata* and *Banksia menziesii* woodland (ErBaBmW)**	A woodland of *Eucalyptus rudis*, *Banksia attenuata* and *Banksia menziesii* over open *Kunzea glabrescens* shrubland over mixed introduced herbs and grasses.	
***Juncus kraussii* sedgeland (JkS)**	A sedgeland of *Juncus kraussii* with other mixed sedge species scattered throughout.	
***Lepidosperma gladiatum* sedgeland (LgS)**	A sedgeland of *Lepidosperma gladiatum* over mixed introduced herbs and grasses.	
***Melaleuca rhaphiophylla* woodland (MrW)**	A low-lying woodland of *Melaleuca rhaphiophylla* over mixed coastal shrubland over *Juncus kraussi*i sedgeland over mixed native and introduced grasses.	

Vegetation Types	Description	Photograph
***Melaleuca rhaphiophylla* woodland over Typha orientalis sedgeland (MrWToS)**	A woodland of *Melaleuca rhaphiophylla* over *Typha orientalis* sedgeland.	
***Salicornia quinqueflora* samphire shrubland (SqSS)**	A samphire shrubland of *Salicornia quinqueflora* over *Samolus repens*.	

Vegetation types recorded in revegetated areas (NAMS, 2024)

Revegetation Category	Description	Photograph
Revegetation (coastal)	Revegetated area with mixed coastal shrubs, including *Acacia saligna*, *Olearia axillaris* and *Scaevola crassifolia*.	
Revegetation (sedges)	Revegetated area with mixed sedges, including *Lepidosperma gladiatum, Ficinia nodosa* and *Juncus kraussii.*	

Appendix 7. Foreshore Fauna List (After NAMS, 2024).

Family	Scientific Name	Common Name	Conservation Status
Bird			
Anatidae	*Anas superciliosa*	Pacific Black Duck	
Anhingidae	*Anhinga novaehollindae*	Australasian Darter	
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	
Scolopacidae	*Calidris ruficollis*	Red-necked Stint	
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black-Cockatoo	Vulnerable
Laridae	*Chroicocephalus novaehollandiae*	Silver Gull	
Columbidae	**Columba livia*	Domestic Pigeon (Rock Dove)	Introduced
Campephagidae	*Coracina novaehollindae*	Black Faced Cuckoo Shrike	
Corvidae	*Corvus coronoides*	Australian Raven	
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird	
Anatidae	*Cygnus atratus*	Black Swan	
Alcedinidae	**Dacelo novaeguineae*	Laughing Kookaburra	Introduced
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird	
Scincidae	*Egernia kingii*	King Skink	
Ardeidae	*Egretta garzetta*	Little Egret	
Ardeidae	*Egretta novaehollindae*	White-faced Heron	
Cacatuidae	*Eolophus roseicapilla*	Galah	
Meliphagidae	*Gavicalis virescens*	Singing Honeyeater	
Monarchidae	*Grallina cyanoleuca*	Magpie-lark	
Artamidae	*Gymnorhina tibicen*	Australian Magpie	
Haematopodidae	*Haemotopus longirostris*	Pied oystercatcher	
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	
Hirundinidae	*Hirundo neoxena*	Welcome Swallow	
Laridae	*Hydroprogne caspia*	Caspian Tern	
Meliphagidae	*Lichenostomus virescens*	Singing Honeyeater	
Meliphagidae	*Lichimera indistincta*	Brown Honeyeater	
Meropidae	*Merops ornatus*	Rainbow Bee Eater	
Phalacrocoracidae	*Microcarbo melanoleucos*	Little Pied Cormorant	
Strigidae	*Ninox boobook*	Boobook Owl	
Columbidae	*Ocyphaps lophotes*	Crested Pigeon	
Pandionidae	*Pandion haliaetus cristatus*	Eastern Osprey	
Pelecanidae	*Pelicanus conspicillatus*	Australian Pelican	
Phalacrocoracidae	*Phalacrocorax sulcirostris*	Little Black Cormorant	
Phalacrocoracidae	*Phalacrocorax varius*	Australian Pied Cormorant	
Columbidae	*Phaps chalcoptera*	Common Bronzewing	
Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater	
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail	
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren	
Columbidae	*Spilopelia chinensis*	Spotted Turtle Dove	
Columbidae	*Spilopelia senegalensis*	Laughing Dove	
Laridae	*Sternula nereis*	FairyTern	
Anatidae	*Tadorna tadornoides*	Australian Shelduck	
Laridae	*Thalasseus bergii*	Crested Tern	
Threskiornithidae	*Threskiomis molucca*	Australian White Ibis	
Psittaculidae	**Trichoglossus moluccanus*	Rainbow Lorikeet	Introduced, Declared Pest
Mammal			
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattle Bat	
Felidae	**Felis catus*	Domestic Cat	Introduced

Leporidae	**Oryctolagus cuniculus*	Rabbit	Introduced, Declared Pest
Muridae	**Rattus rattus*	Black Rat	Introduced
Molossidae	*Tadarida australis*	White-striped Free-tailed Bat	
Reptile			
Scincidae	*Cryptoblepharus buchananii*	Fence Skink	
Scincidae	*Ctenotus fallens*		
Scincidae	*Tiliqua rugosa*	Bobtail	
Amphibian			
Myobatrachidae	*Crinia georgiana*	Quacking Frog	

Appendix 8. Stakeholder Engagement Summary.

Foreshore Strategy Review

ENGAGEMENT REPORT

As stewards of the foreshore, it's crucial for the City to ensure the sustainable management of our beloved waterfront areas.

To get a better understanding of our communities priorities for foreshore preservation and enhancement, we invited all members of our community in April and May 2024 to complete a quick three minute survey or chat to us at one of our pop up listening posts.

This document provides an overview of the community feedback we received which will inform the review of the Foreshore Strategy.

Reach

1445
Melville Talks unique views

2188
Direct emails issued

27.6K
Facebook reach

33K
eNews recipients

Newspaper advertising in PerthNow

Participation

408
Submissions

92.6%
Local residents

86.8%
Ratepayers

What you said about our foreshore areas

79.59%
believe foreshore areas are **very important** to the overall well-being of the City of Melville

Your most significant concerns or worries about foreshore management

- Environmental degradation
- Balancing development
- Community voice being heard
- Infrastructure and maintenance
- Wildlife protection
- Climate change resilience

Action to best protect and preserve our foreshore

- Reducing recreational activities including dog walking and water based activities
- Native species preservation
- Erosion control and management
- Community education and participation
- Infrastructure and access including pathways and river entry
- Regulation and enforcement of damage to foreshores

Below are your priority areas for improvement or conservation with the community listing some areas in multiple categories.

Leave as is

- Bicton Baths
- Heathcote
- Point Walter Reserve
- Blackwall Reach
- Bicton Foreshore

Improve

- Canning Bridge
- Attadale
- Troy Park
- Tompkins Park
- Alfred Cove

Conserve

- Blackwall Reach
- Point Walter Reserve
- Alfred Cove
- Attadale
- Troy Park

City of Melville

Vegetation

60.5% believe vegetation buffers along foreshore areas are **very important** for environmental health

74.38% said that **more** vegetation should be planted in foreshore areas

Vegetation and plants you believe are important to prioritise

- Native trees and plants
- Riparian vegetation including native sedges and shrubs
- Salt-tolerant plants
- Low-growing plants that reduce erosion and preserve views
- Indigenous flora appropriate for wildlife and the river
- Drought-resistant species

There was also recognition of the importance of consulting with experts on the appropriate vegetation for foreshore areas.

Trees

69.34% believe maintaining a healthy tree canopy is **very important** in foreshore areas

73.91% said that **more** trees should be planted in foreshore areas

Areas were you believe more trees should be planted or preserved

Community feedback identified over 20 areas across the 18km of foreshore in the City of Melville.

With more tree planting at:

- *"The dog park near Troy Park needs some more trees."*
- *"Large lawn areas like Attadale and Jeff Joseph are great places to plant more trees."*
- *"at Mount Henry Bridge Playground site."*
- *"More trees should be planted in areas along Melville Beach Rd."*
- *"Burke Drive foreshore is the hottest, most barren, ugliest, hostile to wildlife, wasted piece of foreshore in Perth."*

Tree preservation at:

- *"Trees in Point Walter Reserve and along Burke drive should be preserved as much as possible."*
- *"All existing native and significant trees should be preserved."*
- *"Deep Water Point between both bridges especially where boating takes place."*

Wildlife

68.28% feel protecting the wildlife in our area is **very important**

Protecting wildlife is essential for maintaining the balance of nature and for preserving our environment for future generations. Below are your priority areas for improvement or conservation with the community listing some areas in multiple categories.

Leave as is	Improve	Conserve
• Heathcote • Bicton Baths • Blackwall Reach • Troy Park • Jeff Joseph	• Tompkins Park • Point Walter Reserve • Attadale • Troy Park • Melville Beach Road	• Point Walter Reserve • Blackwall Reach • Alfred Cove • Attadale • Tompkins Park

Action to enhance wildlife conservation in our foreshore areas

- Planting and vegetation management including planting more native species, expand and restore vegetation, and *"replace some turfed areas with bushland."*
- Habitat creation and preservation by providing roosting and nesting boxes, and *"create more wildlife protection zones and enforce these zones."*
- Control of domestic and invasive species including dog access and management of feral animals
- Education programs and signage *"that informs the public of the bird life that can be seen"* and *shares "the importance of conservation in our local areas."*
- Access management and protection of sensitive areas
- Waste and noise pollution control
- Seek expert advice

Freshore restoration and management

47% said you were very concerned about human impacts

such as littering, trampling and inappropriate dog access have on foreshore restoration and management.

You shared concerns about

- The effect of recreational activities including foot traffic associated with walking, jogging and dog walking can lead to soil compaction, trampling of vegetation, and disturbance to wildlife habitats
- The effect of water sports such as boating and jet skiing which could cause erosion and disturb marine life, particularly in shallow waters close to the shore
- Littering and pollution was mentioned as a major problem along with concerns about chemical pollutants
- Residential expansion close to foreshore areas
- Over-fishing and harvesting of shellfish and other marine life
- The impact of tourism and visitors in peak seasons, increasing footfall, littering, and demand for amenities.

Addressing these human threats along with rising sea levels, erosion control and natural environment degradation will require a coordinated effort involving the City of Melville, State Government, scientists, community members, and conservation organisations and groups. Actions you shared to reduce or eliminate these risks included:

- Coordination and collaboration between all stakeholders
- Public education and awareness campaigns on topics such as environmental conservation, responsible pet ownership, waste management, and the impact of human activities on the foreshore ecosystem
- Strengthening regulations related to waste management, dog control, and inappropriate use of foreshore areas to help mitigate threats and enforcing them when needed
- Infrastructure designed to help manage human activities and protect sensitive habitats
- Community involvement to foster ownership and responsibility towards foreshore environments.

Vistor experience

Improvements, additions or activities to enhance and improve visitor experience to make it more enjoyable

- Infrastructure including ramps, picnic areas, BBQs, drink fountains, seating and *"wider multi-user paths to accommodate walkers, runners, and cyclists..."*
- Environmental enhancements including planting, restoration, signage and interactive displays
- Increased safety and security
- Educational programs, tours, walks and *"more information of area in signage & interactive displays."*
- Community participation via events, workshops, volunteer opportunities and *"community led conservation..."*
- Improved transport options and pathways
- Aboriginal cultural education, signage, art and *"Noongar and other First Nations cultural events..."*
- Continued community engagement to align future planning and development with community needs and expectations
- Place activation including *"more venues along the foreshore that can be visited for food and beverage"* along with *"community art events and festivals."*

Educational programs

There was a diverse array of suggestions for educational programs and initiatives to enhance community awareness and appreciation for our foreshore areas.

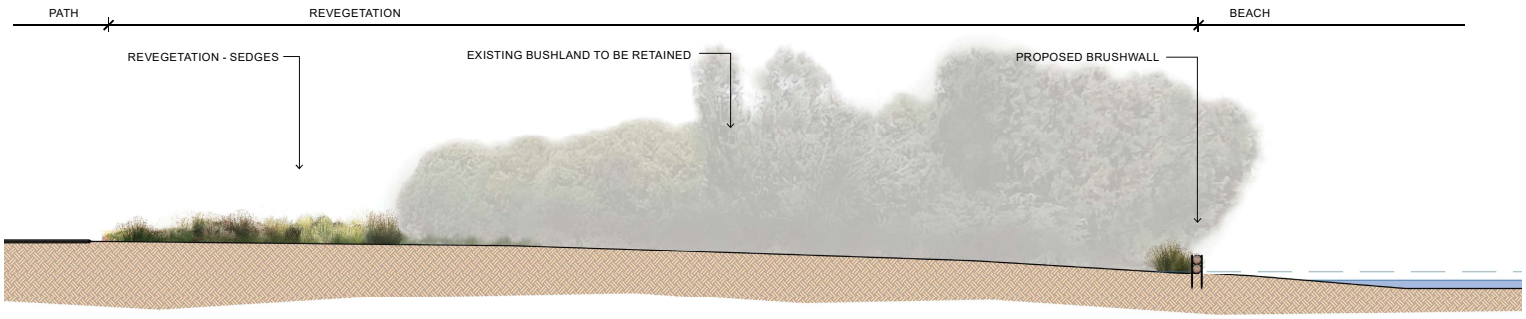
School programs and visits
Signage
Guided nature walks
Information boards
Planting, weeding, or cleanup activities
Interactive learning
Virtual tours and QR code markers
Incorporate Noongar traditional knowledge
Volunteering
Littering, conservation and sustainability campaigns

Appendix 9. Concept Plan Sketches.

JEFF JOSEPH RESERVE - CONCEPT PLAN

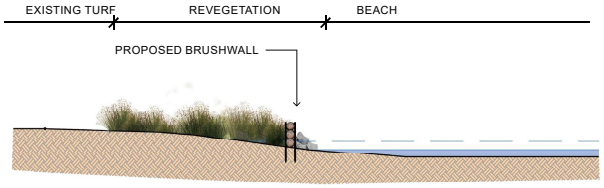
CONCEPT PLAN

0 25 50 m



SECTION A-A'

0 1 2m



SECTION B-B'

0 1 2m

LEGEND

- EXISTING VEGETATION TO BE RETAINED
- REVEGETATION AREA
- SUPLEMENTARY REVEGETATION
- MAINTANENCE ACCESS (*Sporobolus virginicus, Ficinia nodosa)*
- TURF AREA TO BE RETAINED
- LOW NATIVE SPECIES PLANTING
- INFORMAL ACCESS
- BEACH
- PROPOSED TREES
- EXISTING TREES
- EXISTING BRUSHWALL TO BE REPAIRED
- PROPOSED NEW BRUSHWALL

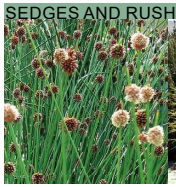
KEY PLANT SPECIES

TREES

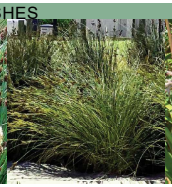
Eucalyptus rudis
15 m

Melaleuca raphiophylla
10 m

SEDGES AND RUSHES



Ficinia nodosa
0.8 m

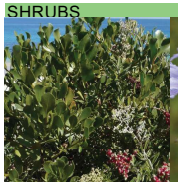


Juncus kraussii
0.8 m

Lepidosperma gladiatum
1 m

Machaerina juncea
1.2 m

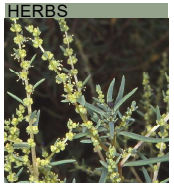
SHRUBS



Rhagodia baccata
0.6 m

Scaevola crassifolia
1 m

HERBS



Suaeda australis
0.3 m

CITY OF MELVILLE
FORESHORE MANAGEMENT PLAN

CLIENT :	CITY OF MELVILLE	DRAWING :	CONCEPT DESIGN	DATE :	24.09.2025
PROJECT :	FORESHORE MANAGEMENT PLAN	DRAWING # :	A1 25001_SK1_002	SCALE :	AS SHOWN @ A1
PROJECT # :	25001	DRAWING REV :	-	DRAWN BY :	SV

SYRINX

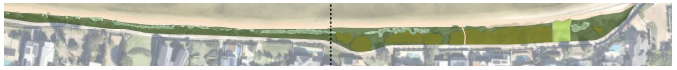
MAJESTIC COVE - CONCEPT PLAN

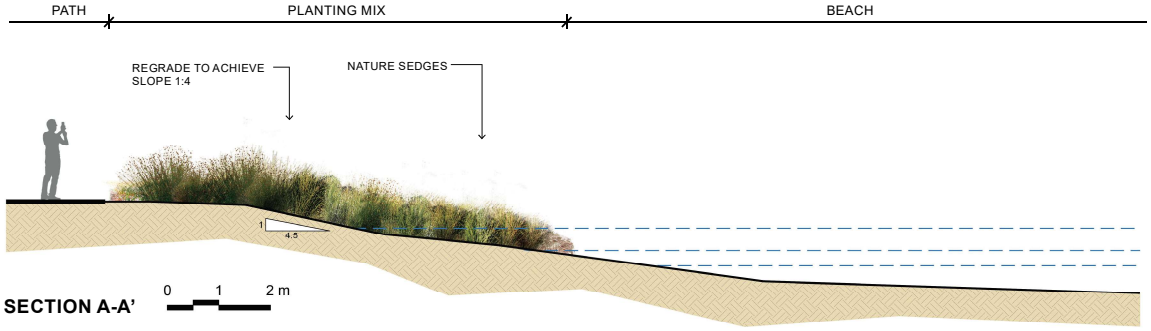
CONCEPT PLAN - SOUTH

0 25 50 m

CONCEPT PLAN - NORTH

0 25 50 m





SECTION A-A'

0 1 2 m

LEGEND

- EXISTING VEGETATION TO BE RETAINED
- REVEGETATION AREA
- SUPPLEMENTARY REVEGETATION
- EXISTING TURF TO BE RETAINED
- INFORMAL ACCESS
- BEACH
- PROPOSED TREES
- EXISTING TREES

KEY PLANT SPECIES

SEDGES

Juncus kraussii
0.8 m

Lepidosperma gladiatum
0.5 m

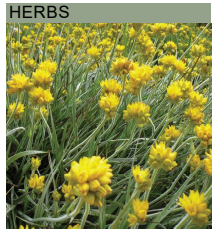
Ficinia nodosa
0.5 m

SHRUBS

Rhagodia baccata
0.6 m

Scaevola crassifolia
0.7 m

HERBS



Conostylis-candicans
0.3 m

TREES

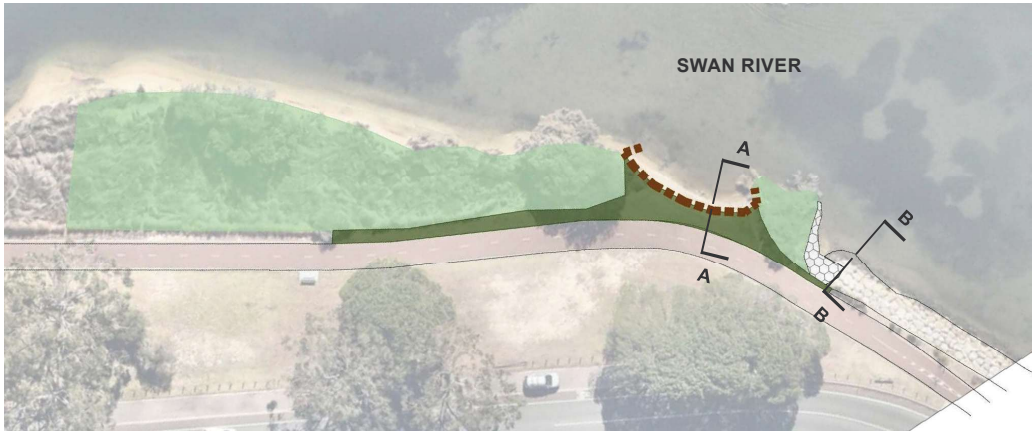
Melaleuca cuticularis
9 m

CITY OF MELVILLE
FORESHORE MANAGEMENT PLAN

CLIENT :	CITY OF MELVILLE	DRAWING :	CONCEPT DESIGN	DATE :	30.07.2025
PROJECT :	FORESHORE MANAGEMENT PLAN	DRAWING # :	A1 25001_SK1_001	SCALE :	AS SHOWN @ A1
PROJECT # :	25001	DRAWING REV :	-	DRAWN BY :	SV

SYRINX

COFFEE POINT - CONCEPT PLAN



CONCEPT PLAN

0 25 50 m

LEGEND

- EXISTING VEGETATION TO BE RETAINED
- REVEGETATION AREA
- BEACH
- ROCK REVETMENT
- PROPOSED NEW BRUSHWALL

KEY PLANT SPECIES

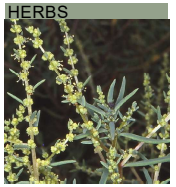
SEDGES AND RUSHES

Ficinia nodosa 0.8 m

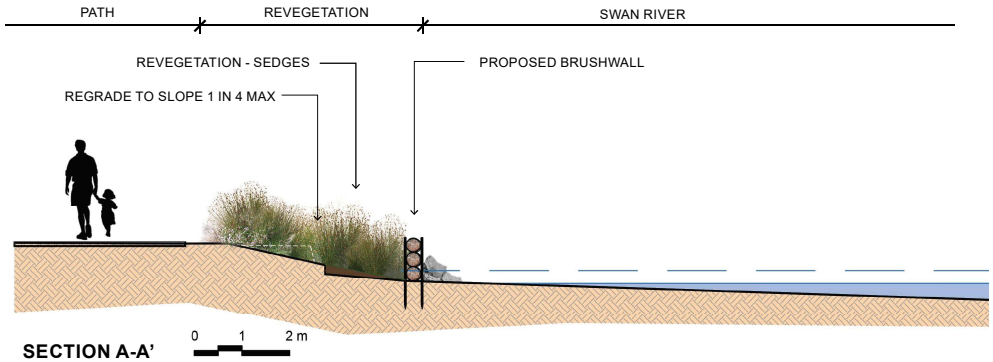
Juncus kraussii 0.8 m

Lepidosperma gladiatum 1 m

HERBS

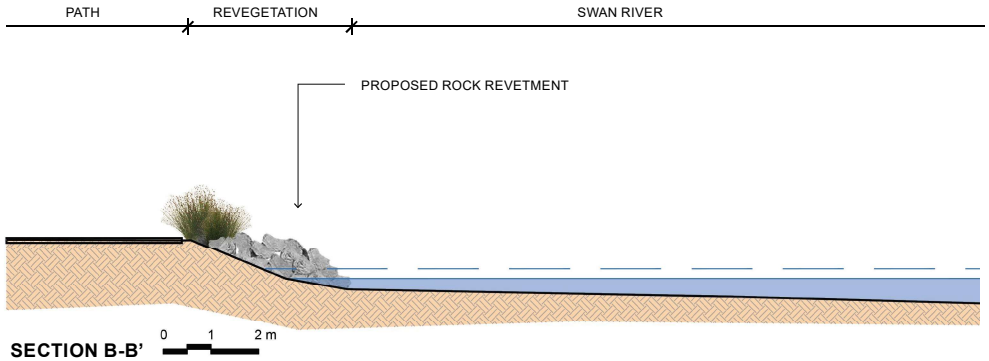


Suaeda australis 0.3 m



SECTION A-A'

EXISTING CONDITION A-A'



SECTION B-B'

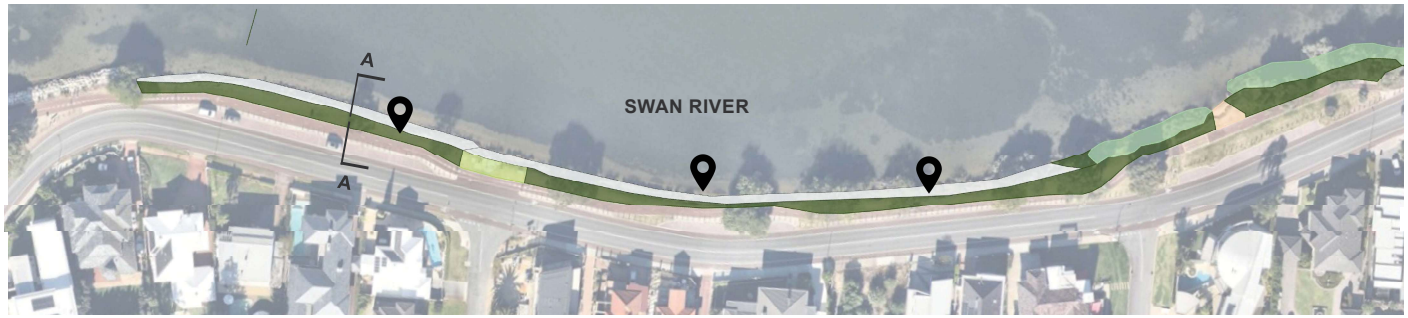
EXISTING CONDITION B-B'

CITY OF MELVILLE
FORESHORE MANAGEMENT PLAN

CLIENT :	CITY OF MELVILLE	DRAWING :	CONCEPT DESIGN	DATE :	25.09.2025
PROJECT :	FORESHORE MANAGEMENT PLAN	DRAWING # :	A1 25001_SK1_003	SCALE :	AS SHOWN @ A1
PROJECT # :	25001	DRAWING REV :	-	DRAWN BY :	SV

SYRINX

CANNING ROAD - CONCEPT PLAN

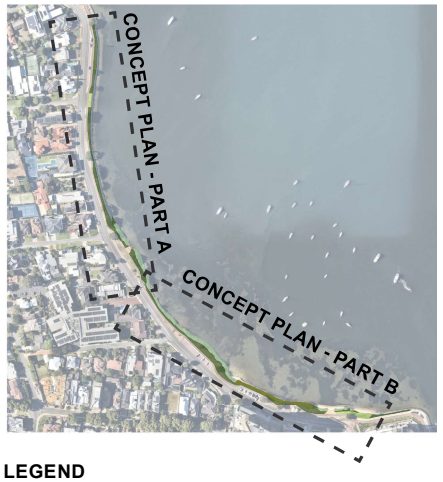


CONCEPT PLAN - PART A

CONCEPT PLAN - PART B

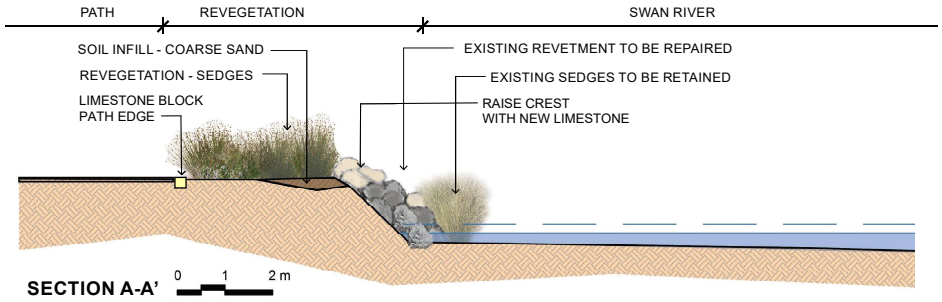
0 25 50 m

LOCALITY PLAN



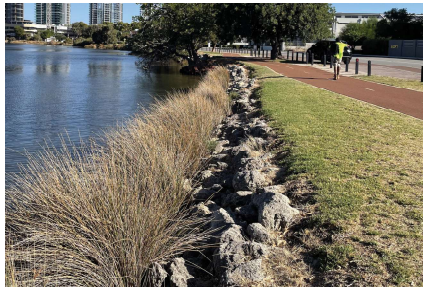
LEGEND

- EXISTING VEGETATION TO BE RETAINED
- REVEGETATION AREA
- SUPPLEMENTARY REVEGETATION
- EXISTING TURF TO BE RETAINED
- BEACH
- PROPOSED ROCK REVETMENT
- EXISTING REVETMENT TO BE REPAIRED
- LOCATION OF PRIORITY SITES FOR REPAIR

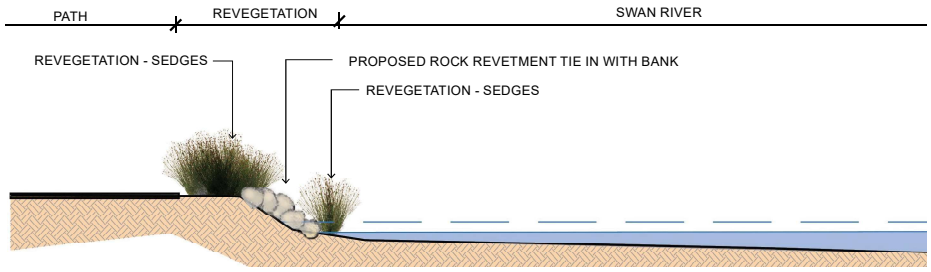


SECTION A-A'

0 1 2 m

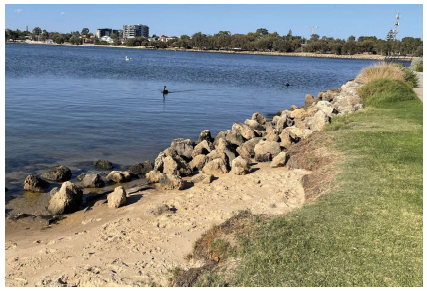


EXISTING CONDITION A-A



SECTION B-B'

0 1 2



EXISTING CONDITION B-B

KEY PLANT SPECIES

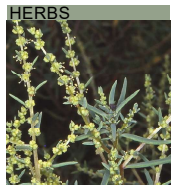
SEDGES AND RUSHES

Ficinia nodosa
0.8 m

Juncus kraussii
0.8 m

Lepidosperma gladiatum
1 m

HERBS



Suaeda australis
0.3 m

CITY OF MELVILLE
FORESHORE MANAGEMENT PLAN

CLIENT :	CITY OF MELVILLE	DRAWING :	CONCEPT DESIGN	DATE :	25.09.2025
PROJECT :	FORESHORE MANAGEMENT PLAN	DRAWING # :	A1 25001_SK1_004	SCALE :	AS SHOWN @ A1
PROJECT # :	25001	DRAWING REV :	-	DRAWN BY :	SV

SYRINX

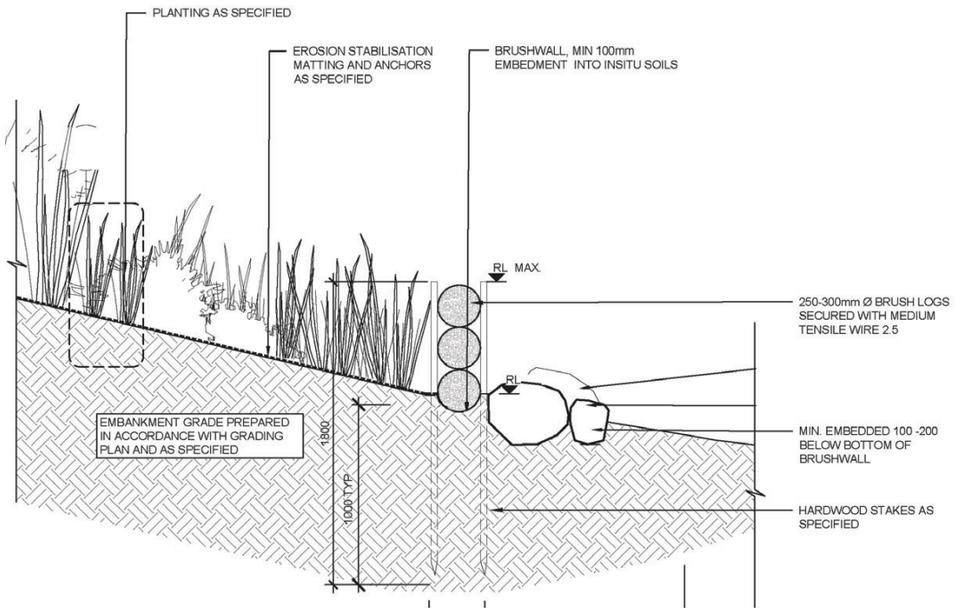
THE ESPLANADE - CONCEPT PLAN - SITE A

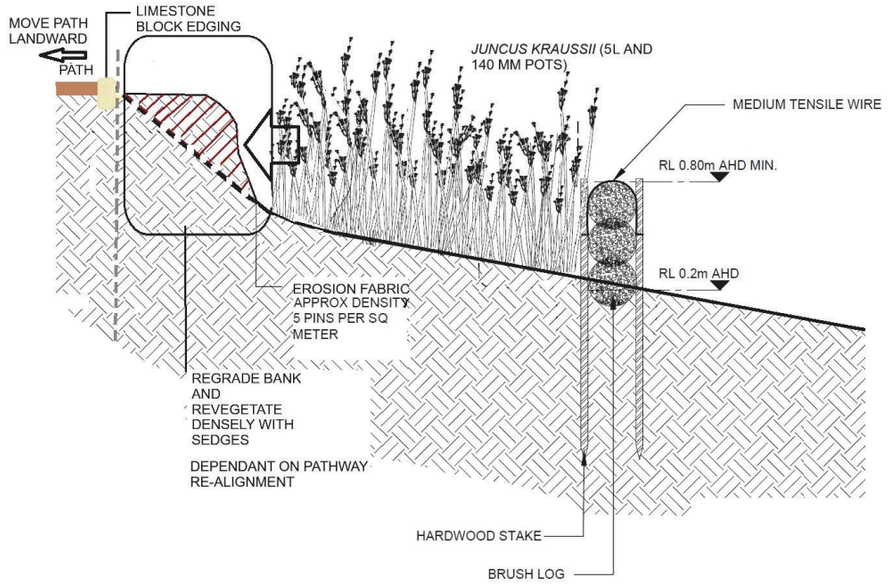
Legend

- Brushwall
- Brushwall with rock toe
- Rock toe
- Regrade/renourish and revegetate

LOCALITY PLAN

CONCEPT PLAN - SITE A





BRUSHWALL WITH ROCK TOE - SECTION 'A'

EXISTING CONDITION 'A'

BRUSHWALL WITH DENSE SEDGE PLANTING - SECTION 'B'

EXISTING CONDITION 'B'

KEY PLANT SPECIES

Ficinia nodosa
0.8 m

Juncus kraussii
0.8 m

Lepidosperma gladiatum
1 m

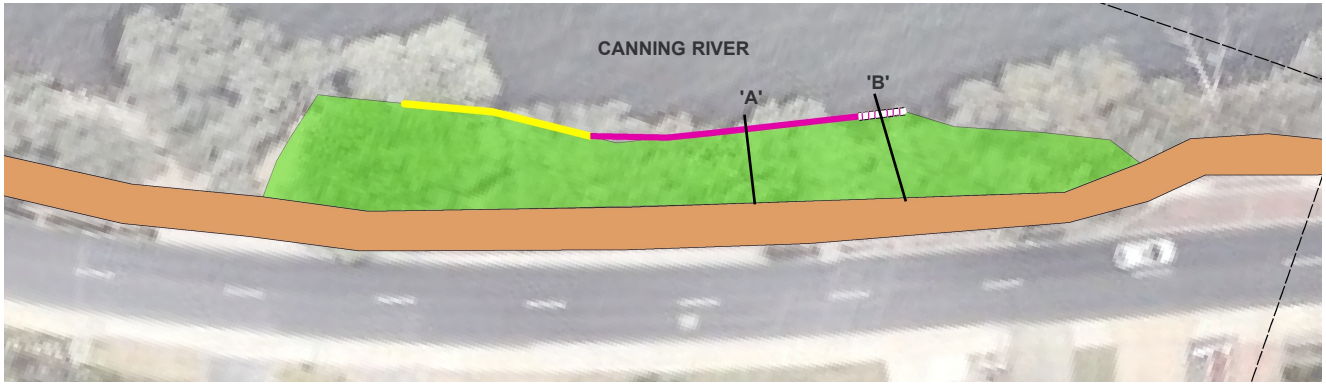
Machaerina juncea
0.8 m

CITY OF MELVILLE
FORESHORE MANAGEMENT PLAN

CLIENT :	CITY OF MELVILLE	DRAWING :	CONCEPT DESIGN	DATE :	16.10.2025
PROJECT :	FORESHORE MANAGEMENT PLAN	DRAWING # :	A1 25001_SK1_004	SCALE :	AS SHOWN @ A1
PROJECT # :	25001	DRAWING REV :	-	DRAWN BY :	RT

SYRINX

THE ESPLANADE - CONCEPT PLAN - SITE C

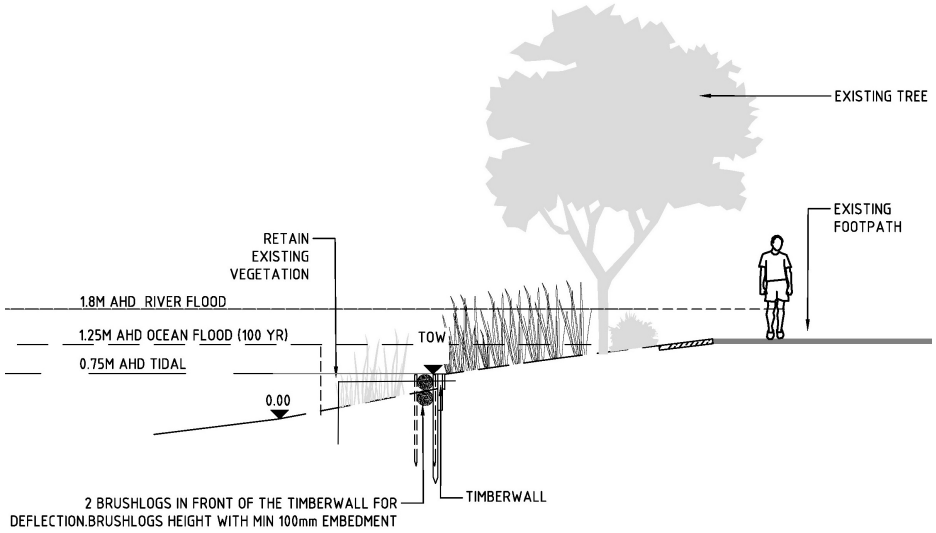


CONCEPT PLAN - SITE C

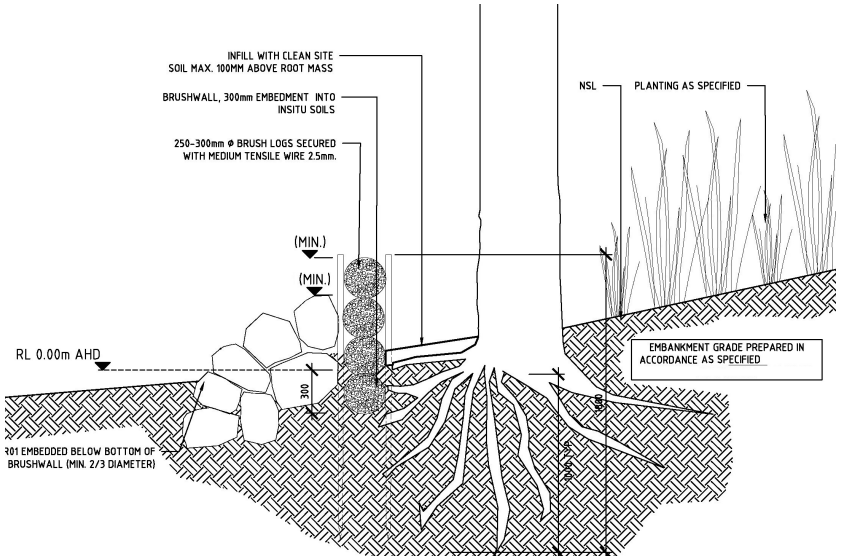
Legend

- Rock toe
- Timbber Wall / Brushwall
- Timber wall repair
- Regrade/renourish and revegetate

LOCALITY PLAN



TIMBER RETAINING WALL WITH BRUSHWALL AS WAVE DEFLECTOR - SECTION 'A'



BRUSHWALL WITH ROCK TOE TIE INS TO EXISTING ROCK RIPRAP UPSTREAM - SECTION 'B'

EXISTING CONDITION - SITE C

EXAMPLE OF RETAINING TIMBER WALL WITH BRUSHWALL WAVE DEFLECTOR

KEY PLANT SPECIES

Ficinia nodosa
0.8 m

Juncus kraussii
0.8 m

Machaerina juncea
0.8 m

CITY OF MELVILLE
FORESHORE MANAGEMENT PLAN

CLIENT :	CITY OF MELVILLE	DRAWING :	CONCEPT DESIGN	DATE :	23.10.2025
PROJECT :	FORESHORE MANAGEMENT PLAN	DRAWING # :	A1 25001_SK1_004	SCALE :	AS SHOWN @ A1
PROJECT # :	25001	DRAWING REV :	-	DRAWN BY :	RT

SYRINX

Appendix 10. Annual Maintenance Schedule.

ANNUAL MAINTENANCE PLAN

Task	Action	Timing / When												Where/ how
		J	F	M	A	M	J	J	A	S	O	N	D	
Erosion control	Repair any urgent erosion sites by placing appropriate erosion control fabric and or brushwall coir log or rock rip rap. Plan for Cap-Ex works. Repair any small eroded areas and or erosion fabric and revegetate.													At the site of erosion. Utilise best practice bioengineering (i.e. utilising biodegradable materials and teaming with revegetation OR rock riprap and revegetation. In severe cases of erosion where banks are very steep to precipitous a rock revetment and or walling (where existing is present) can be used however a detailed design and study needs to be completed prior to works taking place to ensure no up or downstream negative effects. ***NOTE: Urgent erosion control may occur throughout the year using GSCs***
Weed Control	Manually remove weeds growing over native plants (i.e., Sea Spinach, woody weeds) or slash grasses.													Focus on identified areas within sub precinct maps as well as the Natural Areas Team weed maps. Use brush cutters, mowers, loppers, edging tools, and pruning secateurs. Utilise steam weed control in areas of high public use (e.g. Pt Walter Gabions)
	Apply herbicide.													Utilise most appropriate herbicides for use near water and apply at a concentration that is as low as possible whilst being effective. Wherever possible, ensure whole area of the foreshore is treated each time. Specific attention to be given to High priority weeds but also others, particularly prior to revegetation works. Ensure Couch is treated at least three times before revegetation. When treating weeds in high public use areas plan to conduct works during times when the site is not busy and or appropriately fence off sections of the area.
Vegetation management	Prune all branches overhanging the pathways to 3 m (this should allow for the passage of cyclists and maintenance vehicles along the pathway.													Refer to individual sub precinct maps for locations. Alternatively (beyond 2026) refer to maintenance inspection sheets.
Fence repair and installation	Repair or install new fence in accordance with City's specifications. Repair gate latches as required.													Follow The City's guidelines regarding fencing type and height when installing new fences near natural areas. At the development interface, use the fence that is most appropriate to the site and either include or exclude public access to foreshore areas.
Hydraulic structure repair	Repair broken and damaged infrastructure (e.g. pipes headwalls pits etc) where possible and or replace with the standard infrastructure as specified by the City.													Refer to the City guidelines regarding Stormwater outlet structure maintenance and repair
Supplementary planting	Monitor site for plant establishment success in March at the end of summer.													Based on the level of plant losses and native plant coverage, determine the number of supplementary plants required.
	Order plants from nursery													Contact native plant nurseries to secure stock a minimum of 6 months before planting.
	Schedule planting days in collaboration with friends of group/volunteers OR organise contractors to install plants						Upper foreshore			Lower foreshore				Revegetate in accordance with Natural Areas Revegetation / Planting Works program utilising species that are indigenous to the area whenever possible. Lower banks and or bed can be planted from late October - January as this is the growth period for sedges.
	Ensure water is available to water plants upon installation if dry.													Supply water to dry sites using a water truck or a 1000L container like an IBC and a small petrol-driven pump.
	Install plants													Install plants as specified in the planting plan supplied by the Natural Areas team / Consultant.
	Water plants during the first summer													Supply water to dry sites using a water truck or a 1000L container like an IBC and a small petrol-driven pump. Engage the Natural Areas team or a contractor. Plan to avoid watering during or close to weed control.
Refuse, wrack and litter collection	Inspect the areas for litter and collect and remove off site. Wrack may smother sedges along the shoreline, negatively impacting their growth.													Inspect weekly in high use areas and collect and remove all litter material. Check for wrack accumulation, particularly in newly planted areas, after significant storms, and remove to facilitate growth. Remove litter on an ad hoc basis when conducting other maintenance works or do specific litter runs quarterly. Check if Community Volunteer groups can assist – The City to provide info for each site.
Sediment management	Manage stormwater and sediment capture within the catchment before entry into the river: Monitor and clean stormwater outlets.													At the source of sediment (generally a development site or erosion site along the foreshore).
Monitoring / Inspections	Monitor the site for weed invasion and plant establishment success/watering requirements, and erosion structure condition.													Visually inspect restored areas annually, and record data. Ad-hoc monitoring and inspections can be recorded using the Maintenance Inspection Sheet.


SYRINX
Seashore Engineering
GOVERNMENT OF WESTERN AUSTRALIA
Department of Biodiversity, Conservation and Attractions
City of Melville