

Lot 15450 on DP 40341 2397L Marmion Avenue, JINDALEE

Native vegetation clearing permit application

EIA Supporting documentation – Beach Access
Way (BAW) Central Site

December 2023

Table of Contents

1. Introduction	3
2. Background	3
3. Avoidance, Impacts and Mitigations	6
3.1 How impacts have been avoided	6
3.2 How impacts have been minimised	7
4. Scope	Error! Bookmark not defined.
5. Flora and Vegetation	7
6. Fauna	9
7. Clearing Principles	10
9. References	16

1. Introduction

The City of Wanneroo is proposing to undertake the clearing of vegetation within the boundaries of Lot 15450, 2397L Marmion Avenue, JINDALEE. The proposed clearing will enable the staged renewal and upgrade of two (2) existing Beach Access Way (BAW) structures (known as 'Central BAW' and 'South BAW') including demolition and installation works. This EIA document (Attachment A) focuses on the impact of the proposed Central BAW on the Jindalee Foreshore Reserve, JINDALEE, the impact of the proposed Jindalee South BAW is included as a separate EIA (Attachment B).

Table 1 below contains detailed land parcel information of coastal native vegetation affected by the proposed Central BAW clearing permit area and a Certificate of Title for the affected land parcel is included as Attachment C – Certificate of Title.

Table 1. Land ownership and zoning within the Central BAW clearing permit area.

Lot	Deposited Plan	Volume	Folio	Address	Reserve No.	Land Owner	MRS Zoning	Reserve Purpose
15450	40341	3133	575	2397L Marmion Avenue, JINDALEE	20561	Crown Land - City of Wanneroo Management	Parks and Recreation	Recreation and Purposes Incidental Thereto

To facilitate the clearing of coastal vegetation within the boundaries of Lot 15450, 2397L Marmion Avenue, JINDALEE the City submits this supporting documentation to assist the Department of Water and Environmental Regulation (DWER) assessment of the clearing permit application.

2. Background

A coastal assets structural assessment was undertaken by engineering consultants AECOM in 2015 (Attachment D) and updated by GHD in 2021 (Attachment E). The recommendations from these assessments included the renewal and upgrade of several of the City's beach access ways resulting in the development of the City's prioritised Beach Access Ways Upgrade Programme.

The aim of the programme is to renew and upgrade existing beach access ways to ensure they remain fit for purpose, providing safe access to the beach for the community. Each project generally occurs over 2 financial years, the first year includes site investigations, design, and public consultation, with demolition and construction works occurring in the second year.

The 2021 GHD Structural Condition Assessment identified several key structural issues with two beach access ways in Jindalee (Figure 1 below) with the recommendation that they were initially repaired to allow for continued use in the short-term, with full renewal occurring within five (5) years. The 2021 Report findings resulted in these structures being the highest priority for renewal and upgrade when compared to other BAW structures along the City's coastline.

In the 2022/2023 financial year, the site investigations, design and public consultation (occurring from 14/01/2023 to 05/03/2023) were progressed and finalised for both structures. The on-ground demolition and construction of these two structures have been scheduled across the following financial years:

- Summer 2023/24 – Renewal of Jindalee Beach Access Way South; and
- Summer 2024/25 – Renewal of Jindalee Beach Access Way Central.

The proposed clearing requirements for each BAW structure are listed below, with the total proposed clearing equalling 0.0836 hectares (836m²).

- Southern Beach Access Way Clearing Area = 0.0659ha
- Central Beach Access Way Clearing Area = 0.0177ha



Figure 1: Location of the existing BAW Central and BAW South Sites within Jindalee Foreshore Reserve, JINDALEE.

3. Scope

The purpose of this document is to provide an assessment of the Central BAW clearing areas against the *Environmental Protection Act 1986* – Ten Clearing Principles to determine the significance of the proposed Central BAW clearing areas and the impact on the environment. The clearing of coastal vegetation proposed within Lot 15450 for BAW Central Site is 0.0177 hectares (177m²) (Figure 2, Attachment H - Clearing Plan; and Attachment I – Shape files).



Figure 2: Location of the proposed BAW Central clearing area, totalling 0.0177 hectares (177m²) to support the renewal and upgrades to the existing beach access way infrastructure, JINDALEE.

4. Avoidance, Impacts and Mitigations

Unfortunately, there are no alternatives to clearing coastal vegetation in this instance. The western-most portion of the Jindalee Central BAW structure must be demolished, and materials removed from site as the key structural issues pertaining to the footings cannot be repaired. The proposed Jindalee Central BAW clearing area also considers the requirements of the newly designed stair structure and the requirement for the stair structure to be secured appropriately to its location on the rocky coastline. Therefore, the footings of the Jindalee Central BAW structure must be secured to competent rock foundations, and this may result in the need for machinery excavation work. The City and its contractor will ensure that clearing during demolition and construction activities is kept to only the minimum necessary to allow for safe demolition and construction works to occur.

The location of the proposed Central BAW clearing area is unable to be altered and is constrained by the following requirements:

- The location of the existing Jindalee Central BAW structure in the Jindalee Foreshore Reserve:
- The topography and limestone rock formations of the Jindalee Foreshore Reserve surrounding the existing Jindalee Central BAW structure:
- The western-most portion of the Central BAW structure is the only portion of the BAW structure affected by structural issues (GHD, 2021 – Attachment E): and
- The western-most portion of the Central BAW structure is the only portion of the BAW structure recommended for renewal (GHD, 2021).

3.1 How impacts have been avoided

The City undertook a thorough investigation and assessment of options for beach access along the Jindalee coastline, prior to deciding to proceed with the renewal of the stair portion of both the Central and South BAW structures. The investigation process included the following activities:

- Structural condition assessment of coastal structures (GHD, 2021).
- Geotechnical assessment of Jindalee's Central and South BAWs (Galt, 2022 – Attachment F); and
- Options assessment inclusive of multicriteria analysis (MP Rogers & Associates, 2023).

During the investigation and design process the City considered multiple options (MP Rogers & Associates, 2023 – see Attachment G), including:

- Option 1 - Renewing the stair structure of only one BAW (and the demolition of the other BAW structure and dune revegetation of its footprint).
- Option 2 - Renewing the stair sections of both BAW structures.
- Option 3 - Demolition, removal and revegetation of both BAW structures and replacement with a new BAW in a new location within the Jindalee foreshore reserve (located between the current Central and South BAW structures).

The three above options were assessed using multicriteria analysis against nine (9) criteria, including: coastal processes, environmental impacts, public safety, capital cost, maintenance requirements, durability, existing infrastructure, pedestrian traffic requirement, and community preference (MP Rogers & Associates, 2023). Option 2, renewing the stair structures of both BAWs scored highest and was the

preferred option by the community (MP Rogers & Associates, 2023). Option 1 and 2 were considered by the City as scores were similar, 40.6 and 42 respectively, out of a possible 55 (MP Rogers & Associates, 2023). The City resolved to proceed with Option 2 (renew the stair portion of both BAW structures) due to overwhelming community support for this option, 67% versus 11% for option 1 and 22% for option 3.

As only the stair portion of the BAW structure is being renewed, the footprint of each entire BAW structure is not affected, and therefore additional clearing has been avoided.

3.2 How impacts have been minimised

A summary of how the City proposes to mitigate impacts to the surrounding coastal foreshore reserve is listed below:

- Surveying, and clearly delineating, the proposed clearing area with boundary fencing and/or flagging to ensure that during demolition and construction activities, no unauthorised clearing occurs in the surrounding Jindalee coastal foreshore reserve, and that vegetation outside the approved clearing area is not adversely affected.
- A Construction Management Plan (CMP) will be submitted, reviewed, and approved by the City outlining how the Beach Access Ways will be constructed including clearing activities and methodology, the demolition of the existing BAW structures and removal of demolished materials, site hygiene, dust suppression methods and material storage, among other considerations.
- Jindalee foreshore reserve dune areas temporarily disturbed due to demolition and construction works will be stabilised and revegetated following the completion of construction activities, noting that the area is a rocky coastline, revegetation works may not be able to occur in all temporarily disturbed areas due to insufficient depth, or lack of, soil material. Revegetation activities will occur during suitable seasons in line with industry best practice and may be staged over multiple years pending construction completion timeframes.

5. Flora and Vegetation

On 04 October 2023, the City's Environmental Officer (Renee Hill) conducted a vegetation assessment of the proposed 0.0177-hectare Central BAW clearing area (Attachment H – Clearing Plan and Attachment I – Clearing Area shapefiles) identifying a total of 11 species, including 8 native flora and 3 weed species.

The Central BAW clearing area subject to this application are predominately in Good condition, with the dominant species being, *Olearia axillaris*, and *Scaevola crassifolia*. (Attachment J – Site Photographs, Attachment K – Photograph Locations and Flora List, Table 2 below). The site was observed to have low weed cover (predominantly in bare areas) with the dominant weed species being *Pelagonium capitatum* and *Tetragonia decumbens* (Sea Spinach).

Table 2. Species identified during the vegetation assessment on 04 October 2023.

Jindalee Central BAW, JINDALEE VEGETATION ASSESSMENT FLORA LIST

NATIVE SPECIES	WEED/PLANTED SPECIES
<i>Acanthocarpus preissii</i>	<i>Bromus diandrus</i> (Brome grass)
<i>Lepidosperma gladiatum</i>	<i>Pelagonium capitatum</i>
<i>Lomandra maritima</i>	<i>Tetragonia decumbens</i> (Sea Spinach)
<i>Olearia axillaris</i>	
<i>Rhagodia baccata</i>	
<i>Scaevola crassifolia</i>	
<i>Senecio pinnatifolius</i>	
<i>Threlkeldia diffusa</i>	

The vegetation proposed for clearing to facilitate the support the renewal and upgrades to the Central BAW contains remnant native vegetation belonging to the Quindalup Complex. The proposed clearing area occurs within an Environmentally Sensitive Area (Figure 4), Bush Forever Site No. 397 (Figure 3) and forms and Ecological Linkage (Figure 3) north-south through coastal foreshore reserves.

The proposed clearing area lies within an Environmentally Sensitive Area and therefore no possible exemptions may be applied under *Part V* of the *Environmental Protection Act 1986*.

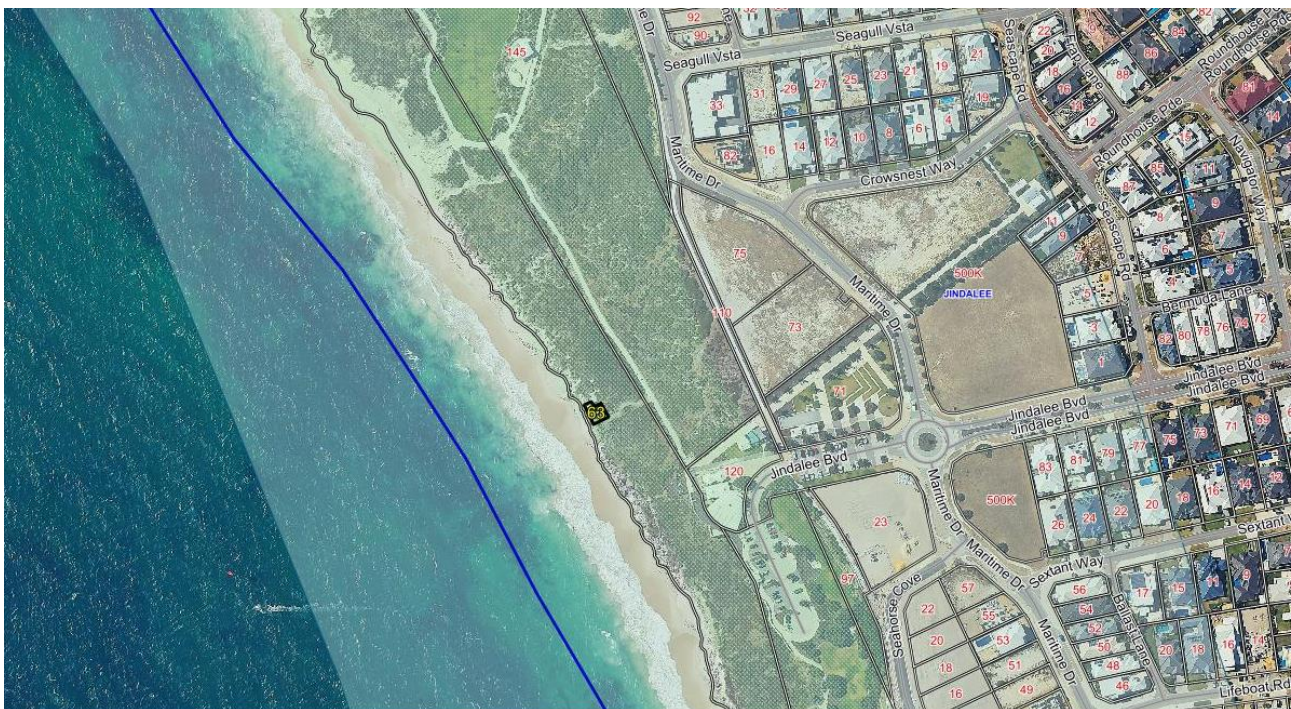


Figure 3. Bush Forever Site 397 shown in green hatching and Regional Ecological Linkages shown in light blue shading.

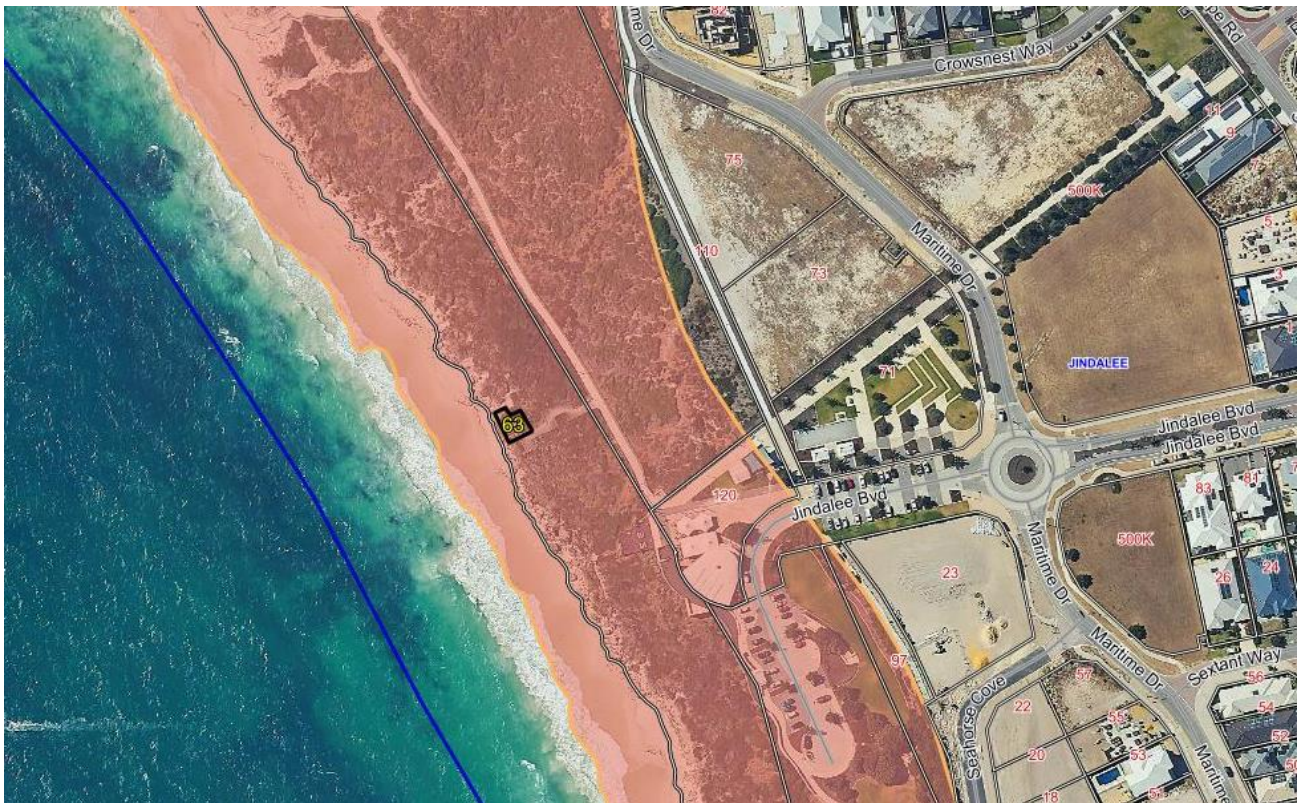


Figure 4. Environmentally Sensitive Area ESA shown in orange shading and the location of Jindalee Central BAW shown as a black-bordered polygon ('Site 63').

6. Fauna

No fauna was documented within the extent of the proposed clearing area during the 04 October 2023 Vegetation Assessment.

The City of Wanneroo's (the City's) Intramap's Environmental Planning Considerations Report (EPCR) did not identify any instances of threatened or priority fauna species within the selected footprint (see Attachment L for further details).

Within a 5km to 6km radius of the proposed clearing area, the City's EPCR, identified the following (see Attachment L for further details):

- Records of State and Federally listed Threatened fauna species.
- Records of State Priority listed fauna species.
- 'Confirmed and 'Possible' Breeding Area Buffer for Carnaby's Cockatoo (*Zanda latirostris*).
- 'Possible' Roosting Area Buffer for Carnaby's Cockatoo.
- Key Biodiversity Area for Birds (Northern Swan Coastal Plain IBA). The IBA is bounded by Moore Rive to the north, Darling Range to the east, Swan River to the South and Indian Ocean to the West and includes remnant vegetation in Spearwood and Bassendean North Heddle vegetation types.
- Contains vegetation mapped as Potential Quenda (*Isodon obesulus*) Habitat.

7. Clearing Principles

An Environmental Planning Considerations Report (EPCR) (Attachment L) and a Desktop Assessment Report for Native Vegetation Clearing (NVC) Application (Attachment M) were generated for the BAW Central Site using the City’s mapping program ‘Intramaps’ as supporting documentation for the below clearing principle assessment. These two reports, along with additional data sources provided by various state and federal departments, were reviewed to determine the level of impact and the level of variance to the clearing principles.

The following table summarises potential environmental impacts and the level of variance against the 10 clearing principles.

Table 3. Assessment of the identified impacts against the 10 Clearing Principles.

Clearing Principle	Proposed Project Impacts
<p><i>Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity</i></p>	<p>The 04/10/2023 Vegetation Assessment identified the proposed Jindalee Central BAW project area as predominately in Good condition, containing good coverage of native species, and weed species.</p> <p>Jindalee Central BAW has historically experienced disturbance in the form of unauthorised vehicle and pedestrian access prior to residential development and ongoing weed invasion. Following construction of the BAW by the Developer, bare foreshore dune areas were intentionally planted with native coastal species for the purposes of dune stabilisation and revegetation.</p> <p>The proposed clearing area is located within Bush Forever Site 397 (DPLH, 2019) and is a mapped Environmentally Sensitive Area (ESA).</p> <p>The City’s Intramap EPCR (Attachment L) identifies the following flora and fauna attributes within the proposed application area:</p> <ul style="list-style-type: none"> • No records of Federal, or State listed TECs. • No records of PEC’s, Threatened and Priority Flora records within the selected boundaries. • No records of EPBC and State listed (Threatened/Specially protected) Fauna, or Priority Fauna recorded within the selected boundaries. • ‘Confirmed and ‘Possible’ Breeding Area Buffer for Carnaby’s Cockatoo (<i>Zanda latirostris</i>). • The proposed clearing area is within an important birding area (Northern Swan Coastal Plain IBA) and • Contains vegetation mapped as Potential Quenda (<i>Isoodon obesulus</i>) Habitat.

	<p>The City's Intramap EPC (Attachment L) identifies the following flora and fauna attributes within 6kms of the proposed Jindalee Central BAW site:</p> <ul style="list-style-type: none"> • 20 Federal listed, and 18 State listed TECs (or their buffers) located within a 5km radius of the proposed application area • 28 PECs (or their buffers) located within a 5km radius of the proposed application area • No Federal listed Threatened Flora records located within a 5km radius of the proposed application area • 3 State listed Threatened, and 2 Priority Flora records located within a 5km radius of the proposed application area • 77 Federal listed, and 78 State listed Threatened Fauna, and 233 Priority listed Fauna recorded within a 5km radius of the proposed application area • 'Possible' Roosting Area for Carnaby's Cockatoo within a 6km radius of the proposed application area. <p>Considering the above, the Jindalee Central BAW application area is likely to be at variance with principle (a).</p>								
<p><i>Principle (b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia</i></p>	<p>The City's NVC (Attachment M) and EPC (Attachment L) identified the application area being within an important birding area (Northern Swan Coastal Plan IBA), containing vegetation mapped as potential Quenda habitat, being within the 'Confirmed and 'Possible' Breeding Area Buffer for Carnaby's Cockatoo, and within 6km's of Carnaby's Cockatoo 'Possible' roosting area.</p> <p>The vegetation assessment on 04/10/2023 identified no suitable breeding, or roosting, vegetation (trees) being present within the application area and as such, no hollows suitable for nesting are present. Vegetation conditioned during the vegetation assessment ranged from Degraded to Good, with majority being in Good Condition.</p> <p>Considering the above, the application area is not likely to be at variance with principle (b).</p>								
<p><i>Principle (c) – Native vegetation should not be cleared if it includes or is necessary for the continued existence of, rare flora.</i></p>	<p>No threatened or priority flora species are identified within the application area during the 04/10/2023 Vegetation Assessment or within the desktop assessment; however, there are threatened, and priority flora species found within 5km's of the proposed clearing area, summarised in the Table below (CoW, 2023a – Attachment L).</p> <p>Table 4. Threatened and Priority flora species within 5km of the Jindalee Central BAW project area.</p> <table border="1" data-bbox="564 1305 1886 1444"> <thead> <tr> <th>Conservation Status</th> <th>Number of Records</th> </tr> </thead> <tbody> <tr> <td>EPBC Act listed</td> <td>0</td> </tr> <tr> <td>State Listed</td> <td>3 Threatened (includes Endangered and Vulnerable records)</td> </tr> <tr> <td>Priority</td> <td>2 (includes Priority 2 and Priority 3 records)</td> </tr> </tbody> </table>	Conservation Status	Number of Records	EPBC Act listed	0	State Listed	3 Threatened (includes Endangered and Vulnerable records)	Priority	2 (includes Priority 2 and Priority 3 records)
Conservation Status	Number of Records								
EPBC Act listed	0								
State Listed	3 Threatened (includes Endangered and Vulnerable records)								
Priority	2 (includes Priority 2 and Priority 3 records)								

	<p>Considering the application area does not contain rare, or priority, flora and the vegetation contains both planted and remnant flora ranging from a Degraded to Good condition, the application area is not likely to be at variance with clearing principle (c).</p>																								
<p>Principle (d) - Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a Threatened Ecological Community.</p>	<p>The City's EPCR (Attachment L) identified Threatened Ecological Communities (and buffers) within a 5km radius of the application area, however no threatened or priority communities are present within the City's proposed 0.0177 hectare clearing area summarised in the Table below (CoW, 2023a).</p> <p>Table 5. Threatened and Priority Ecological Communities within 5km of the Jindalee Central BAW project area.</p> <table border="1" data-bbox="566 475 1890 619"> <thead> <tr> <th>Conservation Status</th> <th>Number of Records</th> </tr> </thead> <tbody> <tr> <td>EPBC Act listed</td> <td>20 (includes critically Endangered records)</td> </tr> <tr> <td>State Listed</td> <td>18 (includes Endangered and Priority records)</td> </tr> <tr> <td>Priority</td> <td>28 (includes Threatened and Priority 1, Priority 2 and Priority 4 records)</td> </tr> </tbody> </table> <p>Due to the absence of an identified TEC within the Jindalee Central BAW application area, the City's proposed clearing is not likely to be at variance to clearing principle (d).</p>	Conservation Status	Number of Records	EPBC Act listed	20 (includes critically Endangered records)	State Listed	18 (includes Endangered and Priority records)	Priority	28 (includes Threatened and Priority 1, Priority 2 and Priority 4 records)																
Conservation Status	Number of Records																								
EPBC Act listed	20 (includes critically Endangered records)																								
State Listed	18 (includes Endangered and Priority records)																								
Priority	28 (includes Threatened and Priority 1, Priority 2 and Priority 4 records)																								
<p>Principle (e) - Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been significantly cleared.</p>	<p>The vegetation proposed for clearing to facilitate the beach access way renewal works at Jindalee Central BAW contains remnant native vegetation belonging to the Quindalup Complex.</p> <p>The table below summarises the native vegetation statistics as described by Department of Biodiversity Conservation and Attractions (DBCA) (Government of WA, 2019).</p> <p>Table 6. Native vegetation statistics (Government of WA, 2019).</p> <table border="1" data-bbox="566 959 1890 1406"> <thead> <tr> <th></th> <th>Pre-European Extent (ha)</th> <th>Current Extent (ha)</th> <th>Extent remaining (%)</th> <th>Current extent in all DBCA managed lands (ha)</th> <th>Extent remaining in all DBCA managed lands (Proportion of Pre-European extent) (%)</th> </tr> </thead> <tbody> <tr> <td>IBRA bioregion</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Swan Coastal Plain /Perth (SWA02)</td> <td>850,785.09</td> <td>276,461.42</td> <td>32.49</td> <td>51,457.07</td> <td>3.25</td> </tr> <tr> <td>Swan Coastal Plain vegetation complexes</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Pre-European Extent (ha)	Current Extent (ha)	Extent remaining (%)	Current extent in all DBCA managed lands (ha)	Extent remaining in all DBCA managed lands (Proportion of Pre-European extent) (%)	IBRA bioregion						Swan Coastal Plain /Perth (SWA02)	850,785.09	276,461.42	32.49	51,457.07	3.25	Swan Coastal Plain vegetation complexes					
	Pre-European Extent (ha)	Current Extent (ha)	Extent remaining (%)	Current extent in all DBCA managed lands (ha)	Extent remaining in all DBCA managed lands (Proportion of Pre-European extent) (%)																				
IBRA bioregion																									
Swan Coastal Plain /Perth (SWA02)	850,785.09	276,461.42	32.49	51,457.07	3.25																				
Swan Coastal Plain vegetation complexes																									

	Quindalup Complex	54,573.87	33,011.64	60.49	5,994.64	10.98						
<p><i>Principle (f) - Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or a wetland</i></p>	<p>In accordance with DBCA’s South-west Vegetation Complex Statistics, vegetation representation within the Quindalup Complex is greater than 30%, with 60.49% currently persisting (Government of WA, 2019).</p> <p>The City’s proposed clearing is not likely to be at variance with clearing principle (e) due to the current extent of the Vegetation Complex and the small clearing requirement of 0.0177 hectares.</p> <p>Wetlands or watercourses are not located within the Jindalee Central BAW clearing permit application area, or within 50 metres of the application area (CoW, 2023b – Attachment M). The coastal foreshore vegetation within the Jindalee Central BAW application area is therefore, not growing in association with a wetland, or watercourse.</p> <p>The closest lake to the application area is Carabooda Lake, located approximately 4.65km, and Nowergup Lake, located approximately 4.66km from the application area (CoW, 2023b).</p> <p>Given the above, the proposed clearing is therefore not likely to be at variance to clearing principle (f).</p>											
<p><i>Principle (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</i></p>	<p>Department of Primary Industry and Regional Development’s (DPIRD) Natural Resource Information (WA) mapping tool identifies the application area as Quindalup South second dune Phase (211Qu_Q2) described as a complex pattern of dunes with moderate relief. Calcareous sands have organic staining to about 20 cm, passing into pale brown sand; some cementation below 1 metre (DPIRD, 2023).</p> <p>DWER’s Perth Groundwater Map identifies the surface geology within the application area as Safety Bay Sand: aeolian and beach lime sand (DWER, 2023).</p> <p>The Groundwater Salinity (Total Dissolved Solids) at the proposed clearing site is Marginal with a salinity range of between 500 - 1000mg/L (DWER, 2023).</p> <p>The proposed clearing area footprint receives an annual mean rainfall of 729mm and is not located within an Acid Sulfate Soil risk area (CoW, 2023b – Attachment M).</p> <p>The table below summarises the land degradation risk as described by DPIRD (2023).</p> <p>Table 7. Risks of land degradation summary for Jindalee Central BAW (DPIRD, 2023).</p> <table border="1" data-bbox="562 1326 1890 1433"> <thead> <tr> <th data-bbox="562 1326 927 1362">Risk categories</th> <th data-bbox="927 1326 1890 1362"></th> </tr> </thead> <tbody> <tr> <td data-bbox="562 1362 927 1399">Wind erosion</td> <td data-bbox="927 1362 1890 1399">50-70% of the map unit had a high to extreme hazard</td> </tr> <tr> <td data-bbox="562 1399 927 1433">Water erosion</td> <td data-bbox="927 1399 1890 1433">3-10% of the map unit has a very high to extreme hazard</td> </tr> </tbody> </table>						Risk categories		Wind erosion	50-70% of the map unit had a high to extreme hazard	Water erosion	3-10% of the map unit has a very high to extreme hazard
Risk categories												
Wind erosion	50-70% of the map unit had a high to extreme hazard											
Water erosion	3-10% of the map unit has a very high to extreme hazard											

Water repellence	50-70% of the map unit had a high susceptibility
Salinity hazard	<3% of map unit has a moderate hazard
Subsurface acidification	<3% of map unit has a high susceptibility
Subsurface compaction	<3% of map unit has a high susceptibility
Flood hazard	<3% of map unit has a moderate to high hazard
Water logging and inundation risk	<3% of map unit has a moderate to very high risk

The erosion risk (due to water and wind) of this site is medium to high noting its proximity to coastal conditions. To reduce the impact to surrounding vegetation, the City, on completion of construction works, will stabilise exposed, sandy areas with 900 GSM Coir mesh matting. Planting will occur into the Coir mesh matting in Winter following the completion of construction activities. In the areas where exposed limestone rock is present, coir mesh matting and planting will not occur due to unsuitable soil substrate material.

Given the above hydrogeological conditions and absence of risk factors associated with clearing within these hydrogeological features, it is not likely for the clearing to result in appreciable land degradation and therefore is not likely to be at variance to clearing principle (g).

Principle (h) - Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

The proposed clearing occurs within the boundaries of Jindalee Foreshore Reserve (BF Site 397 – Figure 3) and is 27 metres away from the adjacent City-managed Wardaanup Park, Jindalee (containing remnant coastal vegetation) and is 307 metres away from Royal James Park, Quinns Rocks (City managed conservation area).

Jindalee Foreshore Reserve is a mapped ESA (Figure 4) and a Regional Ecological Linkage (Figure 3).

There are 3 Bush Forever Sites found within 5km's of the proposed clearing area, summarised in the Table below (CoW, 2023b – Attachment M).

Table 8. Bush Forever Sites within 5km of the Jindalee Central BAW project area (CoW, 2023b).

Distance	Bush Forever Site and distance to project site
Within 1km	Bush Forever Site #397 (0km)
Within 2km	Nil
Within 3km	Bush Forever Site #383 (2.9km)
Within 4km	Nil
Within 5km	Bush Forever Site #130 (4.8km)

	<p>Due to the high value remnant vegetation proposed for clearing within the Jindalee Foreshore Reserve, and, that this vegetation is mapped Bush Forever Site 397, it is likely the proposed clearing is at variance to clearing principle (h).</p>
<p><i>Principle (i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.</i></p>	<p>Wetlands or watercourses are not located within the application area, or within 50 metres of the application area (CoW, 2023b – Attachment M). The coastal heath vegetation within the application area is therefore not growing in association with a wetland or watercourse.</p> <p>As no surface water is present within the proposed clearing area, the proposed clearing is not likely to cause deterioration in surface water quality through sedimentation or eutrophication.</p> <p>The proposed clearing area is not within a Public Drinking Water Source Area, however it is within the Perth Groundwater Area RIWI Act area (CoW, 2023b). Given the availability of adjacent remnant vegetation throughout Bush Forever Site 397, and the proposed small clearing area, it is not considered the proposed clearing will increase groundwater salinity.</p> <p>The proposed clearing is therefore not likely to be at variance to clearing principle (i).</p>
<p><i>Principle (j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause or exacerbate the incidence or intensity of flooding.</i></p>	<p>According to the DAFWA Land Quality flood risk categories <3% of the map unit has a moderate to high flood risk (CoW, 2023b – Attachment M). Noting this, and the small extent of the proposed clearing (0.0177ha), the proposed clearing is not likely to cause, or exacerbate the incidence, or intensity of flooding.</p> <p>The proposed clearing is not likely to be at variance to clearing principle (j).</p>

8. Conclusion

The City of Wanneroo has assessed the proposed clearing of 0.0177ha (177m²) against the ten clearing principles and has found that the clearing may be at variance to clearing principles A, and, H and not likely to be at variance to the remaining clearing principles.

9. References

AECOM Australia Pty Ltd (2015) *City of Wanneroo Coastal Assets – Condition Assessment Report*, 60339489-MA-REP-0001_0. Prepared for City of Wanneroo.

City of Wanneroo (2023b). *Intramaps. Desktop Assessment Report for Native Vegetation Clearing (NVC) Application*. (accessed 13/12/2023).

City of Wanneroo (2023a). *Intramaps. Environmental Planning Considerations Report (EPCR)*. (accessed 13/12/2023).

Department of Planning, Lands and Heritage. (2019). *Bush Forever Areas 2000*. Available at <https://catalogue.data.wa.gov.au/dataset/bush-forever-areas-2000-dop-071#:~:text=The%20policy%20recognises%20the%20protection,Bush%20Forever%20Areas%20in%202000>. (accessed 16/11/2023).

Department of Primary Industries and Regional Development (DPIRD). *Natural Resource Information (WA) Mapping Tool*. <https://maps.agric.wa.gov.au/nrm-info/> (accessed 14/12/2023).
<https://dpiird.maps.arcgis.com/apps/webappviewer/index.html?id=662e8cbf2def492381fc915aaf3c6a0f>

Department of Water and Environmental Regulation (DWER) 2023. *Perth Groundwater Map*. <https://maps.water.wa.gov.au/Groundwater/> (accessed 14/12/2023).

Galt, 2022. *Geotechnical Assessment Jindalee Access Stairs, J2201005 001 R Rev 1*. Prepared for City of Wanneroo.

GHD, 2021. *City of Wanneroo Assets Structural Assessment, 12537609-REP-002-1*. Prepared for City of Wanneroo.

Government of Western Australia. (2019). *2018 South West Vegetation Complex Statistics*. Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth, <https://catalogue.data.wa.gov.au/dataset/dbca>

MP Rogers and Associates Pty Ltd, 2023. *Jindalee Beach Access Way Options Assessment Report, R1793 Rev 1*. Prepared for City of Wanneroo.