



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9578/1
Permit Holder:	City of Wanneroo
Duration of Permit:	From 07 November 2022 to 07 November 2032

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of completing an Unexploded Ordinance (UXO) remediation search and geotechnical survey to enable final design completion, and construction of a beach access, car park, concrete pathway and associated infrastructure.

2. Land on which clearing is to be done

Lot 15452 on Deposited Plan 40341 (Crown Reserve 20561), Two Rocks

Lot 8613 on Deposited Plan 213232 (Crown Reserve 30959), Two Rocks

Lot 8989 on Deposited Plan 213232, Two Rocks

3. Clearing authorised

The permit holder must not clear more than 1.43 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

4. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 07 November 2027.

PART II – MANAGEMENT CONDITIONS

5. Avoid, minimise and reduce the impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

- (a) avoid the *clearing* of *native vegetation*;
- (b) minimise the amount of *native vegetation* to be cleared; and
- (c) reduce the impact of *clearing* on any environmental value.

6. Weed and dieback management

When undertaking any *clearing* authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared;
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared; and
- (d) ensure that personnel carrying out the works are trained in *appropriate plant disease hygiene procedures* and have access to any *equipment or materials needed for plant disease hygiene*.

7. Directional clearing

The permit holder must conduct *clearing* activities in a slow, progressive manner towards adjacent remnant *native vegetation* to allow fauna to move into adjacent *native vegetation* ahead of the *clearing* activity.

8. Erosion management

The permit holder shall begin works associated with the authorised activities under this permit within two (2) months of undertaking *clearing* authorised under this permit.

9. Revegetation and rehabilitation requirements (Bush Forever mitigation)

Within 12 months of the commencement of *clearing*, the permit holder must undertake *revegetation* and *rehabilitation* activities including but not limited to the following actions:

- (a) retain the vegetative material and topsoil removed by *clearing* authorised under this permit and stockpile the vegetative material and topsoil to be used in *revegetation* in an area that has already been cleared within the area cross-hatched red in Figure 1 of Schedule 1.
- (b) commence *revegetation* and *rehabilitation* of the areas cross-hatched red in Figure 1 of Schedule 1 by:
 - (i) laying the appropriate vegetative material and topsoil retained under condition 9(a);
 - (ii) deliberately *planting* tube stock and salvaged *native vegetation*;
 - (iii) ensuring only *local provenance* seeds and propagating material are used to *revegetate* and *rehabilitate* the areas; and
 - (iv) ensuring the *revegetation* and *rehabilitation* composition comprises vegetation resistant to wind erosion.
- (c) implement hygiene protocols by cleaning earth-moving machinery of soil and vegetation prior to entering and leaving the *revegetation* and *rehabilitation* sites;
- (d) establish at least four 5 x 5 metre quadrat monitoring sites within *revegetated* areas;

- (e) monitor quadrats specified in condition 9(d) at least annually;
- (f) monitoring of quadrats specified in condition 9(d) is to be undertaken by an *environmental specialist*;
- (g) achieve the completion criteria specified in the attached Schedule 2 (revegetation completion criteria) after the three year monitoring period for areas *revegetated* and *rehabilitated* under this permit;
- (h) undertake weed control activities on an 'as needs' basis to maintain a minimum criteria in the attached Schedule 2 (*revegetation* completion criteria);
- (i) undertake *remedial actions* for areas *revegetated* where monitoring indicates that revegetation has not met the completion criteria, outlined in the attached Schedule 2 (revegetation completion criteria), including:
 - (i) *revegetate* the area by deliberately *planting native vegetation* that will result in the minimum targets specified in the attached Schedule 2 (*revegetation* completion criteria) ensuring only *local provenance* seeds and propagating material are used;
 - (ii) undertake further weed control activities;
 - (iii) undertake watering activities; and
 - (iv) undertake annual monitoring of each *revegetated* and *rehabilitated* site, until the completion criteria outlined in the attached Schedule 2 (*revegetation* completion criteria) are met.

10. Flora management

- (a) Where *priority flora* is identified in accordance with the 'Two Rocks Beach Access Way Flora and Vegetation Survey – Detailed and Targeted: One Tree Botanical. Revision 2.1. 17 November 2020', the permit holder must clear no more than four *Beyeria cinerea* subsp. *cinerea* individuals identified within the area cross-hatched yellow in Figure 1 of Schedule 1.
- (b) The permit holder must ensure that the location of *priority flora* recorded in accordance with the 'Two Rocks Beach Access Way Flora and Vegetation Survey – Detailed and Targeted: One Tree Botanical. Revision 2.1. 17 November 2020', including all *Beyeria cinerea* subsp. *cinerea*, *Leucopogon maritimus* and *Stylidium maritimum* within 30 metres from the outer boundary of the area cross-hatched yellow in Figure 1 of Schedule 1, are identified and demarcated through flagging. These can be identified either as the location of individual plants, or where this is not practical, the areal extent of the population and an estimate of the number of plants are to be documented using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees. This must be completed prior to commencing:
 - (i) the Unexploded Ordinance Search and remediation works;
 - (ii) the construction of the beach access road, carpark, pathway and associated infrastructure; and
 - (iii) *revegetation* and *rehabilitation* required under condition 9 of this permit.
- (c) Where *priority flora* are identified and demarcated under condition 10b, the permit holder must ensure that no *clearing* of *priority flora* occurs.

11. Vegetation management – fencing

The permit holder must:

- (a) Within 12 months of *clearing*, the permit holder must construct a fence along the perimeters of the areas cross-hatched red on attached Schedule 1, Figure 3.
 - (i) Fences should allow for the movement of wildlife by being raised 15 centimetres from the ground.
 - (ii) Within one month of installing the fences in accordance with condition 11(a)(i) of this permit, the permit holder must notify the *CEO* in writing that the fencing has been completed.
 - (iii) The permit holder must inspect the fence constructed in accordance with condition 11(a)(i) of this permit every 12 months for the duration of this permit to ensure the fence is protecting adjacent vegetation by excluding pathway users and vehicles.
 - (iv) Where the permit holder identifies that the fence constructed in accordance with condition 11(a)(i) of this permit is not protecting adjacent vegetation by excluding pathway users and vehicles, the permit holder must repair the fence.
- (b) Within 12 months of *clearing*, the permit holder must construct a fence along the perimeters of the areas cross-hatched red on attached Schedule 1, Figure 4.
 - (i) Fences should allow for the movement of wildlife by being raised 15 centimetres from the ground.
 - (ii) Within one month of installing the fences in accordance with condition 11(b)(i) of this permit, the permit holder must notify the *CEO* in writing that the fencing has been completed.
 - (iii) The permit holder must inspect the fence constructed in accordance with condition 11(b)(i) of this permit every 12 months for the duration of this permit to ensure the fence is protecting adjacent vegetation by excluding pathway users and vehicles.
 - (iv) Where the permit holder identifies that the fence constructed in accordance with condition 11(b)(i) of this permit is not protecting adjacent vegetation by excluding pathway users and vehicles, the permit holder must repair the fence.

12. Offset – revegetation and rehabilitation requirements

Within 12 months of the commencement of *clearing*, the permit holder must undertake *revegetation* and *rehabilitation* activities including but not limited to the following actions:

- (a) commence *revegetation* and *rehabilitation* of at least 1.3 hectares of *native vegetation* within the areas cross-hatched red in Figure 5 of Schedule 1 by;
 - (i) deliberately *planting* tube stock and salvaged *native vegetation*; and
 - (ii) ensuring only *local provenance* seeds and propagating material are used to *revegetate* and *rehabilitate* the areas.
 - (iii) ensuring the *revegetation* composition shall include vegetation resistant to wind erosion.
- (b) implement hygiene protocols by cleaning earth-moving machinery of soil and vegetation prior to entering and leaving the *revegetation* and *rehabilitation* sites;
- (c) establish at least four 5 x 5 metre quadrat monitoring sites within *revegetated* areas;
- (d) monitor quadrats specified in condition 12(c) at least annually;

- (e) monitoring of quadrats specified in condition 12(d) is to be undertaken by an *environmental specialist*;
- (f) achieve the completion criteria specified in the attached Schedule 2 (*revegetation completion criteria*) after the three year monitoring period for areas *revegetated* and *rehabilitated* under this permit;
- (g) undertake weed control activities on an ‘as needs’ basis to maintain a minimum criteria in the attached Schedule 2 (*revegetation completion criteria*);
- (h) undertake *remedial actions* for areas *revegetated* and *rehabilitated* where monitoring indicates that revegetation has not met the completion criteria, outlined in the attached Schedule 2 (*revegetation completion criteria*), including:
 - (i) *revegetate* and *rehabilitate* the area by deliberately *planting native vegetation* that will result in the minimum targets specified in the attached Schedule 2 (*revegetation completion criteria*) ensuring only *local provenance* seeds and propagating material are used;
 - (ii) undertake further weed control activities;
 - (iii) undertake watering activities; and
 - (iv) undertake annual monitoring of each *revegetated* and *rehabilitated* site, until the completion criteria outlined in the attached Schedule 2 (*revegetation completion criteria*) are met.

PART III – RECORD KEEPING AND REPORTING

13. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised <i>clearing</i> activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the <i>clearing</i> occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) direction of clearing; (e) the size of the area cleared (in hectares); (f) actions taken to avoid, minimise, and reduce the impacts and extent of <i>clearing</i> in accordance with condition 5; (g) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 6; (h) evidence supporting compliance with conditions 7 and 8 of this Permit; and (i) evidence supporting compliance with condition 11 of this Permit, including actions taken to protect adjacent vegetation

No.	Relevant matter	Specifications
		by the erection and maintenance of appropriate fencing, and the date in which the fence was constructed and/or maintained.
2.	In relation to flora management pursuant to condition 10	<p>(a) the name and location of each <i>priority flora</i> species, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;</p> <p>(b) actions taken to demarcate each <i>priority flora</i> species recorded;</p> <p>(c) the date <i>priority flora</i> was demarcated and the date the activities under condition 10(b)(i), 10(b)(ii) and 10(b)(iii) commenced.</p> <p>(d) actions taken to avoid the <i>clearing</i> of <i>priority flora</i> species.</p>
3.	In relation to <i>revegetation</i> and <i>rehabilitation</i> of areas pursuant to condition 9 of this permit.	<p>(a) the location of areas <i>revegetated</i> and <i>rehabilitated</i> recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees;</p> <p>(b) description of the <i>revegetation</i> and <i>rehabilitation</i> activities undertaken;</p> <p>(c) the size of the area <i>revegetated</i> and <i>rehabilitated</i> (in hectares);</p> <p>(d) <i>remedial actions</i> required to be undertaken; and</p> <p>(e) evidence supporting compliance with condition 9 of this permit.</p>
4.	In relation to <i>revegetation</i> and <i>rehabilitation</i> of offset areas pursuant to condition 12 of this permit.	<p>(a) the location of areas <i>revegetated</i> and <i>rehabilitated</i> recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees;</p> <p>(b) description of the <i>revegetation</i> and <i>rehabilitation</i> activities undertaken;</p> <p>(c) the size of the area <i>revegetated</i> and <i>rehabilitated</i> (in hectares);</p> <p>(d) <i>remedial actions</i> required to be undertaken; and</p> <p>(e) evidence supporting compliance with conditions 12 of this permit.</p>

14. Reporting

- (a) The permit holder must provide to the *CEO* on or before 30 June of each calendar year, a written report containing:

- (i) the records required under condition 13 of this permit; and
 - (ii) records of activities done by the permit holder under this permit between 1 January and 31 December of the preceding calendar year.
- (b) If no *clearing* authorised under this permit has been undertaken, a written report confirming that no *clearing* under this permit has been carried out, must be provided to the *CEO* on or before 31 December of each calendar year.
- (c) The permit holder must provide to the *CEO*, no later than 90 calendar days prior to the expiry date of this permit, a written report of records required under condition 13, where these records have not already been provided under condition 14(a).

DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

Table 2: Definitions

Term	Definition
<i>appropriate plant disease hygiene procedures</i>	means documented procedures that include the inspection and cleaning of vehicles, machinery, equipment, tools and footwear.
<i>CEO</i>	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
<i>clearing</i>	has the meaning given under section 3(1) of the EP Act.
<i>condition</i>	a condition to which this clearing permit is subject under section 51H of the EP Act.
<i>equipment or materials needed for plant disease hygiene</i>	means plastic tubs, brushes, plastic bags, alcohol wipes and drums, backpacks or spray bottles with 70% ethanol or methylated spirits in 30% water; or 20% household bleach (with 5% active ingredient) in 80% water; or quaternary ammonium disinfectant diluted according to manufacturer's directions.
<i>environmental specialist</i>	means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of two (2) years' work experience relevant to the type of environmental advice that an environmental specialist is required to provide under this permit, or who is approved by the CEO as a suitable environmental specialist.
<i>fill</i>	means material used to increase the ground level, or to fill a depression.
<i>dieback</i>	means the effect of <i>Phytophthora</i> species on native vegetation.
<i>Department</i>	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
<i>EP Act</i>	<i>Environmental Protection Act 1986</i> (WA)
<i>mulch</i>	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
<i>native vegetation</i>	has the meaning given under section 3(1) and section 51A of the EP Act.
<i>Local provenance</i>	means native vegetation seeds and propagating material from natural sources within 25 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared.
<i>planting</i>	means the re-establishment of vegetation by creating soil conditions and planting seedlings of the desired species.

Term	Definition
<i>priority flora</i>	means those plant taxa described as priority flora classes 1, 2, 3, or 4 in the Department of Biodiversity, Conservation and Attractions Threatened and Priority Flora List for Western Australia (as amended from time to time).
<i>remedial action/s</i>	means for the purpose of this permit, any activity that is required to ensure successful re-establishment of understorey to its pre-clearing composition, structure and density, and may include a combination of soil treatments and <i>revegetation</i> .
<i>revegetate/revegetated/revegetation</i>	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
<i>rehabilitate/rehabilitated/rehabilitation</i>	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
<i>weeds</i>	means any plant – <ul style="list-style-type: none"> (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i>; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

14 October 2022

Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1).

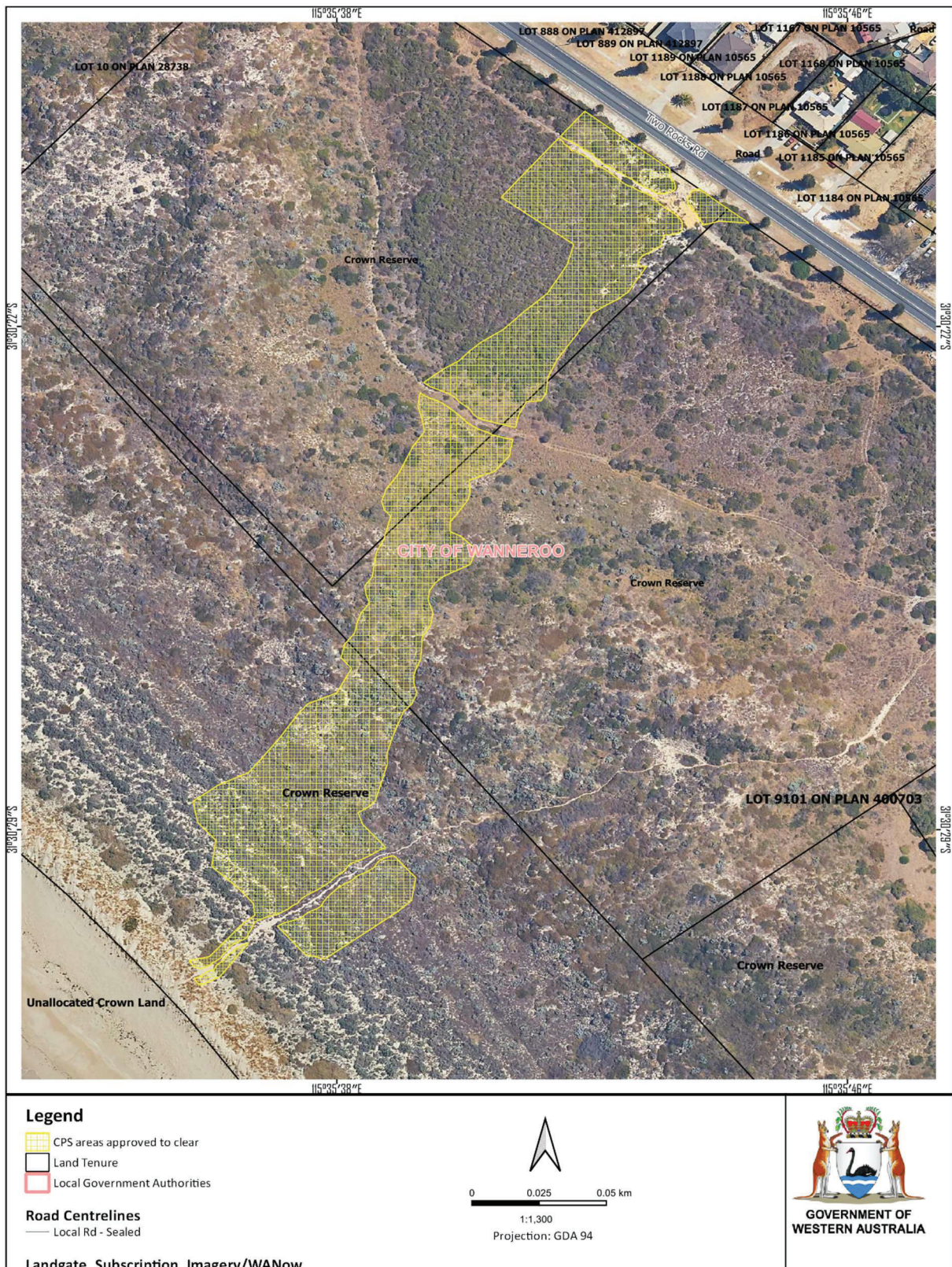


Figure 1: Map of the boundary of the area within which clearing may occur

The boundaries of the areas where specific conditions apply are shown in the maps below (Figure 2, Figure 3, Figure 4 and Figure 5).

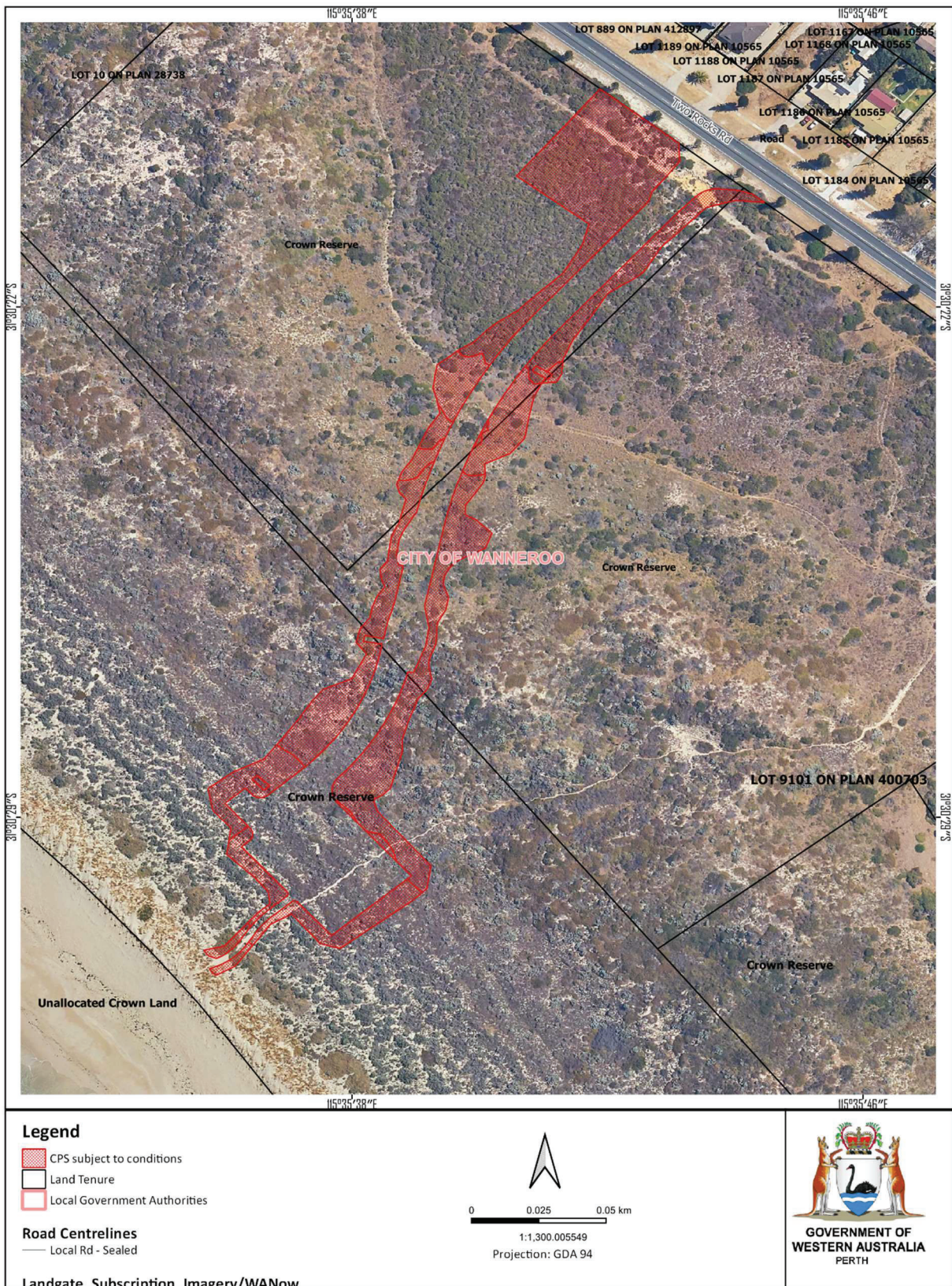


Figure 2: Map of the boundaries of the areas where revegetation and rehabilitation conditions apply



Figure 3: Map of the boundaries of the areas where fencing conditions apply within temporary cleared areas



Figure 4: Map of the boundaries of the areas where fencing conditions apply within the offset site



Figure 5: Map of the boundaries of the areas where offset area revegetation and rehabilitation conditions apply

Schedule 2

CPS 9578/1 *revegetation* completion criteria are shown in the table below (Table 1).

Table 1: Revegetation completion criteria

Criterion	Baseline floristic data	Completion targets	Completion criteria	Monitoring
1	Species richness is the average number of species between the reference sites of each vegetation community.	Minimum of 50% of native vegetation species returned based on propagation capacity of species. Therefore revegetation areas shall have a minimum of 50% native species per quadrat, as obtained by the average recorded at the reference sites.	Species richness and number of plants / m ² in the revegetation areas shall have a minimum of 50% native species per quadrat, as obtained by the average recorded at the reference sites.	The species and number of plants / m ² in the revegetation areas will be counted in years 2, 3 and 5.
2	% cover of weeds in quadrats of each vegetation community is 2% - 30%	Weeds are mostly absent from the quadrats. Considering external pressures (adjacent areas used for public recreation) a target of ≤10% has been established for the revegetation areas.	The revegetation areas must have % cover of ≤10% weeds.	Monitor revegetation areas in years 2 and 3 and 5.
3	Survival rate of species to be achieved	If after year 2 and year 3 of planting, a survival rate of 2 plants/m ² is not achieved, all planted tube stock that have not survived must be replanted within 12 months and monitored for a further 1 year.	The revegetation site needs to ensure a survival rate of no less than 2 plants/m ² is achieved after three years, and replant any plants within 12 months of dying.	The number of surviving plants in revegetation areas will be counted in years 2, 3 and 5.
4	Rubbish is not present in bushland.	Rubbish is absent from the revegetation sites.	The revegetation site contains minimal rubbish.	Monthly asset inspections
5	Unauthorised access is minimised	Fencing is installed and maintained to prevent unauthorised access to the revegetation areas.	Fencing is maintained and there are no visible signs of vandalism and/or unauthorised access to the revegetation site.	Monthly asset inspections
6	Feral animals are mitigated	Potential impacts from introduced animals are monitored and mitigated, where required.	Mitigation measures are implemented if there are visible signs of introduced animals species e.g. rabbits, foxes etc.	Monitor revegetation areas as part of annual reports and as part of monthly asset inspections
7	Priority species are retained	All priority species located immediately outside the construction area are to be retained.	No priority species located immediately outside the construction area are impacted.	The priority species are demarcated before, during and after the UXO search and construction



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9578/1
Permit type:	Purpose permit
Applicant name:	City of Wanneroo
Application received:	31 January 2022
Application area:	1.43 hectares of native vegetation
Purpose of clearing:	Facilitating future developments of beach access and carpark
Method of clearing:	Mechanical
Property:	Lot 15452 on Deposited Plan 40341, Two Rocks Lots 8613 and 8989 on Deposited Plan 213232, Two Rocks
Location (LGA area/s):	City of Wanneroo
Localities (suburb/s):	Two Rocks

1.2. Description of clearing activities

The vegetation proposed to be cleared is contained within a single contiguous area (see Figure 1, Section 1.5).

The application is to clear 1.43 hectares of native vegetation to facilitate the:

- completion of an unexploded ordnance (UXO) remediation search
- completion of a geotechnical survey to enable final design completion
- construction of a beach access, car park, concrete pathway and associated infrastructure (see Figure 1, Section **Error! Reference source not found.**).

The applicant has advised that the facilities proposed within the beach access track and car park facility are listed in the Table below:

Table 1: Proposed Beach Access and associated facilities

Beach access and car park infrastructure	Associated Infrastructure
<ul style="list-style-type: none">• Beach access road• Car park• Concrete path	<ul style="list-style-type: none">• Drainage and scour protection• Conservation fencing• Kerbing• Solar Lighting• Removable bollard(s)• Planting and mulch• Bicycle rack• Informative signage• Rubbish Bins

1.3. Decision on application

Decision:	Granted
Decision date:	14 October 2022
Decision area:	1.43 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and two submissions were received. Consideration of matters raised in the public submissions is summarised in Appendix B.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix C), relevant datasets (see Appendix G.1), the findings of flora and fauna surveys (see Appendix F), the clearing principles set out in Schedule 5 of the EP Act (see Appendix D), an offset proposal (see Section 4), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that the proposed clearing will result in:

- The loss of 1.42 hectares of Bush Forever site 397, representing a significant remnant of native vegetation and provides suitable habitat for:
 - two Priority 3 (i) priority ecological communities (PEC), including 0.12 hectares of the '*Northern Spearwood shrublands and woodlands*' (SCP24) and 0.95 hectares of the '*Coastal shrublands on shallow sands, southern Swan Coastal Plain*' (SCP29a) communities.
 - conservation significant fauna, including *Isodon fusciventer* (quenda; Priority 4) and *Neelaps calonotos* (black-striped snake; Priority 3).
- The loss of four (4) *Beyeria cinerea* subsp. *cinerea* (Priority 3) individuals.
- The potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and habitat values.
- Impacts to fauna resident during the clearing process and longer term due to the restriction of local movements.
- Potential land degradation in the form of wind erosion.

The applicant has suitably demonstrated avoidance and minimisation measures (Section 3.1). Whilst the proposed clearing area comprises 1.43 hectares of native vegetation, the proposed revegetation of 0.78 hectares will result in 0.65 hectares that will remain unvegetated. The Delegated Officer considers that significant residual impacts remain, due to the permanent loss of 0.65 hectares of Bush Forever site 397 (Coastal Strip from Wilbinga to Mindarie) (Section **Error! Reference source not found.**).

Consistent with the Western Australian Environmental Offset Policy (2011) and WA Environmental Offsets Guidelines (2014), and pursuant to section 51(2)(b) of the EP Act, to mitigate the significant residual impacts described above, the Permit Holder is required to provide an offset. Applying the required 2:1 ratio for impacts to Bush Forever, a 1.3 hectare offset is necessary. The offset involves the rehabilitation and revegetation of 1.475 hectares of Bush Forever site 397 (Coastal Strip from Wilbinga to Mindarie) (Section **Error! Reference source not found.**) (City of Wanneroo 2022c), which exceeds the offset required.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (Section **Error! Reference source not found.**) and the provision of a suitable offset (Section **Error! Reference source not found.**), the Delegated Officer determined the proposed clearing can be minimised and managed to not likely to lead to an unacceptable risk to environmental values. The Delegated Officer decided to grant a clearing permit subject to conditions to:

- Avoid and minimise to reduce the impacts and extent of clearing.
- Take steps to reduce the risk of the introduction and spread of weeds and dieback to minimise impacts to adjacent vegetation.
- Undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity.
- Limit the clearing of conservation significant flora to four *Beyeria cinerea* subsp. *cinerea* individuals.
- Require that all priority flora within 30 metres of the application area boundary is identified and demarcated prior to clearing, to avoid unintentional clearing of conservation significant flora.

- Ensure construction commences within two (2) months of the cessation of clearing to minimise the risk of wind erosion.
- Revegetate temporary clearing areas within 12 months of the commencement of clearing to mitigate impacts to Bush Forever area 397, habitat suitable for conservation significant flora, fauna and communities, and ecological connectivity within the coastal landscape.
- Install conservation-style fencing that allows for the movement of wildlife by being raised 15 centimetres from the ground and restricts public access into the Bush Forever site.
- Implement an offset to counterbalance residual environmental impacts as described above.

1.5. Site map(s)



Figure 1 Map of the application area. The areas cross-hatched yellow indicates the area authorised to be cleared under the granted clearing permit.

2 Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the polluter pays principle
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)
- State Planning Policy 2.8: Bushland Policy for the Perth Metropolitan Region (2010)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- *Environmental Offsets Guidelines* (August 2014)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The City of Wanneroo engaged a consultant to conduct a feasibility study, which recommended the need for an additional beach access in Two Rocks given (City of Wanneroo 2022b):

- The current approved structure plans and population forecasts for Two Rocks indicate ongoing pressures for additional safe and accessible beach accesses in the southern Two Rocks area.
- There is currently a lack of access to identifiable swim beach zones in Two Rocks and limited public car park availability in proximity to beach zones and other beach side infrastructure.
- A Coastal Aquatic Risk Assessment conducted by Surf Life Saving WA recommended formalising existing informal tracks in the area due to imminent demand.

The feasibility study considered three potential locations for the beach access road and carpark (Figure 2). The final location was selected as shown in Figure 2 (Location A), as it provides the shortest route from Two Rocks Road, through Crown Land and to the beach, thereby reducing potential environmental impacts and the need for native vegetation clearing (City of Wanneroo, 2022b). The proposed location was also most suitable from a traffic safety perspective (City of Wanneroo, 2022b). The application area was identified to be the least undulating, presents fewer impacts to existing dunes and requires minimal stormwater management (City of Wanneroo 2020b).

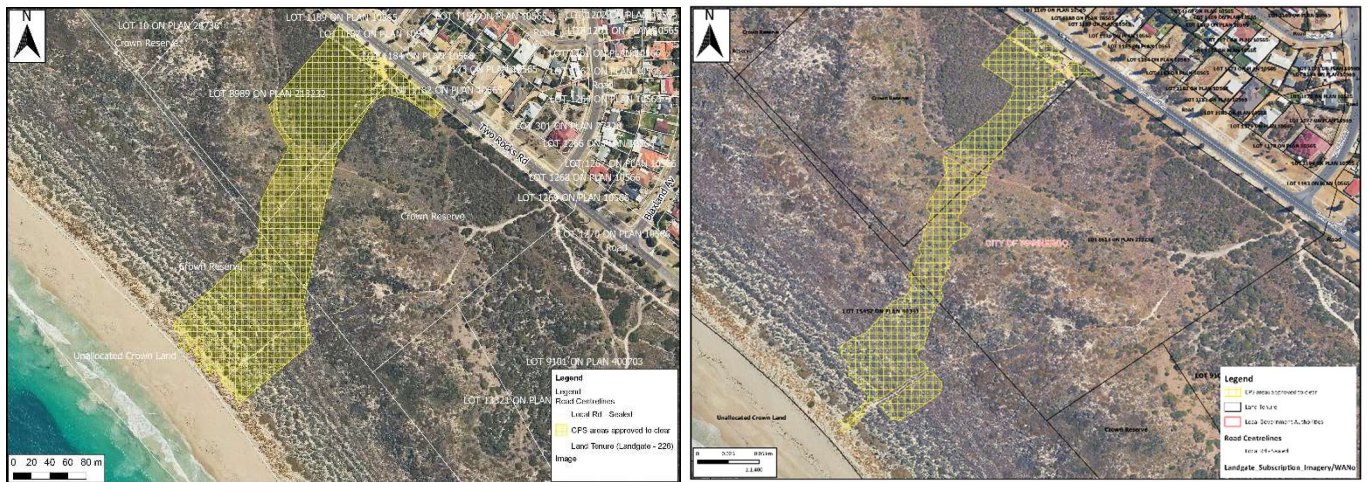


Figure 4 – The final application area for clearing permit CPS 8807/1 reduced to 3.54 hectares of native vegetation (left; yellow-hatching). The final application area for clearing permit CPS 9578/1 proposing to clear 1.43 hectares (right).

On 16 May 2022, the City of Wanneroo advised that they intended to provide an offset that involved:

- Changing the vesting of the two land parcels from ‘Freehold’ to ‘Crown Land’ to secure the tenure of the land in perpetuity; and
- Transferring the management of the two land parcels from DPLH to the City, for perpetual on ground management.

On 20 May 2022, the City of Wanneroo provided a revegetation and rehabilitation plan for the Two Rocks beach access (CPS 9578/1) (City of Wanneroo, 2022c). The City of Wanneroo has committed to revegetating 0.78 hectares of temporary clearing areas disturbed during construction of the Two Rocks beach access (City of Wanneroo, 2022c, Figure 4).

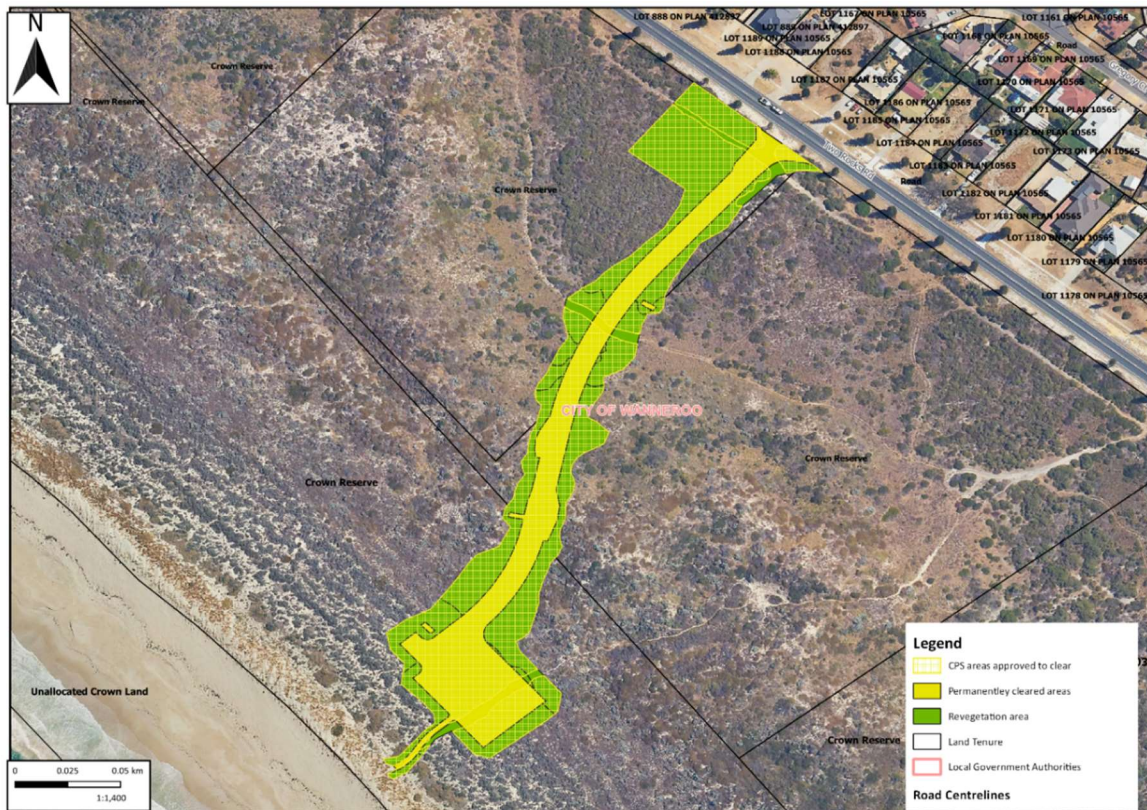


Figure 5: CPS 9578/1 clearing and revegetation areas.

On 12 June 2022, the City of Wanneroo provided an offset that involved the revegetation of 1.475 hectares within Lots 13321 and 15452, Spot View, and consists of a blowout area (Figure 5). The offset proposal also includes the retention of a three metre wide track to be fenced along either side. The additional 0.175 hectares will be banked to provide an offset for the potential clearing associated with the UXO search and fence installation along the track alignment, should an offset be required.



Figure 6: Offset site (shaded green)

The applicant has committed to further measures to manage potential impacts to flora, vegetation and fauna, including (City of Wanneroo 2022c):

- Salvage the four (4) *Beyeria cinerea* subsp. *cinerea* (Priority 3) individuals required to be cleared within the application area (Figure 1) and use the individuals in the revegetation of the application area (Figure 5; **Error! Reference source not found.**).
- Identify and demarcate priority flora species within 30 metres from the boundary of the application area prior to any work commencing in the area. The individual species will be checked for intact demarcation and photographed to ensure they are not impacted. This will occur at the following stages of the project, including prior to the UXO search and construction, and after construction and revegetation of the battered surfaces. All records of these checks will be maintained with no inadvertent loss to individuals.
- Provision of training awareness sessions to all key personnel involved in the project to communicate the preservation and importance of conservation significant flora species that occur within and adjacent to the application area.
- Fauna awareness training sessions to communicate:
 - the conservation and importance of fauna species to all key personnel involved in the project and as part of the induction process.
 - the importance of allowing fauna to safely move into adjacent native vegetation during construction ahead of the clearing activity.
- Where species are unable to safely move on, a qualified wildlife handler will be called to relocate the species. A wildlife carer will be immediately called to remove and rehabilitate any injured fauna.

- Management measures will be implemented to restrict access into adjacent vegetation.
- The Two Rocks beach access will be managed through the City of Wanneroo's feral animal control program.
- Weed and dieback measures (City of Wanneroo 2022c).

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

After consideration of avoidance and mitigation measures, it was determined that an offset to counterbalance the significant residual impacts to Bush Forever area 397 was necessary. In accordance with the Government of Western Australia's Environmental Offsets Policy and Environmental Offsets Guidelines, these significant residual impacts have been addressed through the conditioning of environmental offset requirements on the permit. The nature and suitability of the offset provided is summarised in Section 4.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix C) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values. The assessment against the clearing principles (see **Error! Reference source not found.**) identified that the impacts of the proposed clearing present a risk to flora and fauna habitat, vegetation considered significant as a remnant, a conservation area, and land resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (flora and vegetation) - Clearing Principles (a) and (d)

Assessment

According to available databases, 19 flora of conservation significance have been recorded within the local area, comprising one Threatened, one Priority 1, four Priority 2, ten Priority 3 and three Priority 4 taxa (Western Australian Herbarium, 1998-). None of these records occur over the application area. A preliminary assessment identified that noting the preferred habitat types, including soil and vegetation types mapped over the application area, the vegetation within the application area may comprise suitable habitat for *Conostylis pauciflora* subsp. *euryrhipis* (Priority 4), *Leucopogon maritimus* (Priority 1) and *Stylidium maritimum* (Priority 3). One threatened flora, *Eucalyptus argutifolia* (vulnerable) is known from six records within the local area, with the nearest occurring approximately 4.4 kilometres from the application area. Based on the habitat preferences of this species, it is not likely to occur within the application area.

A detailed and targeted flora and vegetation survey was conducted over the application area by One Tree Botanical Pty Ltd in September 2019 (One Tree Botanical 2020; **Error! Reference source not found.**). The study area encompassed 12 hectares, extending entirely within Lot 8613 of Deposited Plan 213232 and partially within Lot 8989 of Deposited Plan 213232 and Lot 15452 of Deposited Plan 40341, Two Rocks (**Error! Reference source not found.**). The survey recorded 160 taxa from the study area, of which 100 (or 63 percent) were native species, and 60 were weed species which mainly occurred adjacent to existing tracks and disturbed areas (Vegetation Type E1) (One Tree Botanical 2020; City of Wanneroo 2022b). The taxa represented 53 different plant families and 130 plant genera (One Tree Botanical 2020). No declared weeds listed under the *Biosecurity and Agriculture Management Act 2007* were recorded within the application or study areas (One Tree Botanical 2020).

No threatened flora listed under the BC Act or EPBC Act were recorded during the survey (One Tree Botanical 2020). The flora and vegetation survey recorded 13 *Beyeria cinerea* subsp. *cinerea* (Priority 3) individuals within the study area, and of these, four records occur within the application area (One Tree Botanical 2020). *Leucopogon maritimus* (Priority 1) and *Stylidium maritimum* (Priority 3) were recorded within close proximity to the application area, but were not identified within the application area (One Tree Botanical 2020; **Error! Reference source not found.**).

Conservation significant flora with the potential to occur within the application area are assessed further below:

- *Beyeria cinerea* subsp. *cinerea* is an open, erect to spreading shrub from the spurge family (Euphorbiaceae) (One Tree Botanical 2020). The WA Herbarium has 51 collections of this species distributed in a narrow near-coastal band between Mandurah and Port Gregory (One Tree Botanical 2020). According to available databases, no records of *Beyeria cinerea* subsp. *cinerea* are known from within a 10 kilometre radius of the application area (local area). The flora and vegetation survey recorded 490 *Beyeria cinerea* subsp. *cinerea* individuals within Vegetation Type C of the study area (One Tree Botanical 2020; **Error! Reference source not found.**). The applicant has redesigned the beach access and clearing area to avoid and minimise the impacts to this species (Section **Error! Reference source not found.**). The number of *Beyeria cinerea*

subsp. *cinerea* proposed to be cleared was reduced from 36 in the initial clearing permit application CPS 8807/1 to four (4) individuals within this application. (Section **Error! Reference source not found.**; City of Wanneroo 2022b).

Noting the number of individuals recorded during the survey, the species is well represented in the immediate area. The clearing of four *Beyeria cinerea* subsp. *cinerea* individuals or 0.82 per cent of the population identified is not likely to significantly impact the population or the conservation status of the species. The applicant has committed to salvage the four *Beyeria cinerea* subsp. *cinerea* individuals identified within the application area and use these in the revegetation of the application area (Section 3.1). This requirement will be captured through standard revegetation conditions on the permit.

- *Leucopogon maritimus* (Priority 1) is a low spreading shrub from the heath family (Ericaceae) that grows approximately 40 centimetres tall by 60 centimetres wide (One Tree Botanical 2020). This species is known from 17 collections from the WA Herbarium distributed in a small range in a narrow coastal band from Alkimos to north of Two Rocks (One Tree Botanical 2020). According to available databases, *Leucopogon maritimus* is known from 15 records within the local area, between 1960 to 2008 (Western Australian Herbarium 1998). None of the records occur over the application area. The nearest record occurs approximately 200 metres from the application area (Western Australian Herbarium 1998-). The flora and vegetation survey recorded 13 individuals from the study area within Vegetation Type C (see Figure 2 of **Error! Reference source not found.**). None of these records occur within the application area (One Tree Botanical 2020). However, *Leucopogon maritimus* individuals were identified within close proximity to the application area (One Tree Botanical 2020).
- *Stylidium maritimum* (Priority 3) is a perennial herb from the triggerplant family (Stylidiaceae) with tufted linear strappy grass-like leaves (One Tree Botanical 2020). This species typically occurs in association with sand over limestone, dune slopes and flats, coastal heath and shrubland, and open Banksia woodland (Western Australian Herbarium 1998-). *Stylidium maritimum* is known from 42 collections from the WA Herbarium distributed in a narrow near-coastal band between Mandurah and Leeman (One Tree Botanical 2020). According to available databases, the species is known from 10 records within the local area, between 1990 to 2007 (Western Australian Herbarium 1998-). The nearest record occurs approximately 1.2 kilometres from the application area (Western Australian Herbarium 1998-). None of the records occur over the application area. The flora and vegetation survey recorded 35 individuals within Vegetation Type C of the study area (**Error! Reference source not found.**). None of these records occur within the application area (One Tree Botanical 2020). However, *Stylidium maritimum* records were identified within close proximity to the application area (One Tree Botanical 2020).
- *Conostylis pauciflora* subsp. *euryrhipis* (Priority 4) is a rhizomatous, stoloniferous perennial, grass-like or herb, that grows to approximately 0.18 metres in height and flowers between August to October (Western Australian Herbarium, 1998-). According to available databases, the species is known from nine records within the local area, between 1994 to 2013 (Western Australian Herbarium 1998-). The nearest record occurs approximately 1.9 kilometres from the application area (Western Australian Herbarium 1998-). Noting the flowering time of this species, it is likely to have been identified during the flora and vegetation survey if present. *Conostylis pauciflora* subsp. *euryrhipis* was not recorded during the flora and vegetation survey (One Tree Botanical 2020).

Noting the above, the proposed clearing will result in the direct loss of four *Beyeria cinerea* subsp. *cinerea* individuals or 0.82 per cent of the population identified, which is not likely to significantly impact the population or the conservation status of the species. All other priority flora will be avoided by the applicant. Given the information above, the proposed clearing is not likely to significantly impact conservation significant flora within the application or local area, or alter their conservation status. There is potential that the proposed clearing activities could result in the introduction or spread of weeds and dieback (*Phytophthora* spp) into adjacent vegetation, which could impact habitat quality and connectivity.

According to available databases, four conservation significant ecological communities are known from within the local area (Western Australian Herbarium 1998-; Appendix C). None of these records occur over the application area. No threatened ecological communities (TECs) listed under the BC Act or EPBC Act were recorded within the application area during the flora and vegetation survey (One Tree Botanical, 2020). Two Priority 3 (i) PECs or variants of these communities were recorded, including 'Coastal shrublands on shallow sands, southern Swan Coastal Plain' (floristic community 29a; Priority 3) and 'Northern Spearwood shrublands and woodlands', (floristic community type 24; Priority 3).

The 'Coastal shrublands on shallow sands, southern Swan Coastal Plain' (Priority 3) PEC is characterised by heaths on shallow sands over limestone close to the coast, with no single dominant but including *Spyridium globulosum*, *Rhagodia baccata* and *Olearia axillaris* (DBCA, 2021). This community was represented in Vegetation Types B1 and D1 of the flora and vegetation survey (One Tree Botanical 2020; **Error! Reference source not found.**).

Approximately 6.6 hectares of this PEC was mapped within the study area, and of this, approximately 0.95 hectares (14.4 per cent) occurs within the application area.

The 'Northern Spearwood shrublands and woodlands' (Priority 3) PEC is characterised by heaths with scattered *Eucalyptus gomphocephala* (tuart) occurring on deeper soils north from Woodman Point. Most sites occur on the Cottesloe unit of the Spearwood system (DBCA 2021). The heathlands in this group typically include *Banksia sessilis*, *Calothamnus quadrifidus*, and *Schoenus grandifloras* (DBCA 2021). This ecological community is associated with the tuart woodlands ecological community; however no tuart was observed within or adjacent to the study area (One Tree Botanical 2020). This occurrence is likely to represent an unusual subtype, due to its extreme westerly distribution and three priority flora forming a substantial component of species assemblage of the vegetation (One Tree Botanical 2020). This community was represented within Vegetation Type C1 of the flora and vegetation survey (One Tree Botanical 2020; **Error! Reference source not found.**). Approximately 1.8 hectares of this PEC was mapped within the study area, and of this, approximately 0.12 hectares (6.67 per cent) occurs within the application area.

No other conservation significant ecological communities were identified within the survey area (One Tree Botanical 2020). Priority 3 (i) PECs are poorly known ecological communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation. Given the connectivity and condition of vegetation within the application area with the surrounding remnant vegetation condition, the distribution of both PECs is likely to extend beyond the surveyed study and clearing area.

Noting the above, the extent and composition of the vegetation proposed to be cleared, and proposed revegetation of temporary cleared areas to resemble that of preclearing vegetation, the proposed clearing is not likely to significantly impact the 'Coastal shrublands on shallow sands, southern Swan Coastal Plain' and 'Northern Spearwood shrublands and woodlands' Priority 3 PECs or alter their conservation status. The proposed clearing activities could result in the introduction or spread of weeds and dieback into adjacent vegetation, which could impact habitat quality and connectivity.

Conclusion: Based on the above assessment, the proposed clearing will result in the:

- direct loss of four (4) *Beyeria cinerea* subsp. *cinerea* individuals or 0.82 per cent of the population identified
- clearing of approximately 0.95 hectares of the 'Coastal shrublands on shallow sands, southern Swan Coastal Plain' and 0.12 hectares of the 'Northern Spearwood shrublands and woodlands' Priority 3 PECs
- potential introduction of weed and dieback to adjacent remnant vegetation.

For the reasons set out above, it is considered that the impacts of the proposed clearing to the biological values of priority flora and ecological communities can be managed by:

- taking steps to minimise the risk of the introduction and spread of weeds and dieback
- limiting clearing to four *Beyeria cinerea* subsp. *cinerea*
- identifying, demarcating and avoiding priority flora within 30 metres from the application area boundary
- installing and maintaining conservation style fencing
- revegetation and rehabilitation of temporary cleared areas following the construction of the beach access track and the proposed offset site to ensure habitat is not permanently lost.

Conditions: To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Implement weed and dieback management measures to mitigate impacts to adjacent vegetation.
- Installation and maintenance of fencing to protect adjacent native vegetation and priority flora.
- Implementation of priority flora management conditions that:
 - limit the clearing of *Beyeria cinerea* subsp. *cinerea* to four individuals to avoid significant impacts to the population.
 - require the identification, demarcation and avoidance of priority flora, including *Beyeria cinerea* subsp. *cinerea*, *Leucopogon maritimus* and *Stylidium maritimum*, within 30 metres from the application area boundary to prevent unintentional clearing and impacts to these species.
- Implement the revegetation and rehabilitation of temporary cleared areas following the construction of the beach access track to ensure habitat is not permanently lost.
- Provision of an offset (Section 4) for the significant residual impacts to Bush Forever site 397, representing a significant remnant of native vegetation and provides suitable habitat for conservation significant flora and communities.

3.2.2. Biological values (fauna) - Clearing Principle (b)

Assessment: According to available databases, 25 conservation significant fauna species have been recorded within the local area comprising 12 Threatened, one Priority 1, one Priority 2, three Priority 3, three Priority 4, three specially

protected Migratory species and one other specially protected species (OS) and one specially protected species (conservation dependent; CD) fauna taxa. None of these records occur over the application area.

Thirteen of these fauna are associated with marine, estuarine or freshwater habitats that do not occur within the application area (Appendix **Error! Reference source not found.**). Due to the proximity of the Indian Ocean, many marine species were identified in database records and these have not been considered further. In determining the likelihood of conservation significant fauna occurring within the application area, consideration was given to the results of the fauna survey, preferred habitat types and typical home ranges, proximity of records to the application area, and the type and condition of the vegetation within the application area. Seabirds, shorebirds and migratory wading species could utilise the shoreline, but none are likely to utilise the application area itself. A summary of fauna recorded within the local area and with the potential to occur within the application area is presented in Appendix C.

A vertebrate fauna survey of the application area was conducted by Terrestrial Ecosystems in August 2019 (Terrestrial Ecosystems 2020; Figure 1; **Error! Reference source not found.**). The study area encompassed 12 hectares, extending entirely within Lot 8613 of Deposited Plan 213232 and partially within Lot 8989 of Deposited Plan 213232 and Lot 15452 of Deposited Plan 40341, Two Rocks (Figure 1; **Error! Reference source not found.**). Three broad fauna habitats were recorded during the fauna survey, including (Terrestrial Ecosystems 2020):

- coastal low heath on sand
- mixed open shrubland and heath on sand
- mixed closed shrubland over sand and limestone.

The study area also comprised areas that were cleared and highly disturbed, and provides no habitat value (Terrestrial Ecosystems 2020). The fauna survey and assessment concluded that (Terrestrial Ecosystems 2020):

- The vegetation within the application area may provide suitable habitat for *Isoodon fusciventer* (quenda; Priority 4) and *Neelaps calonotos* (black-striped snake; Priority 3).
- *Zanda latirostris* (Carnaby's cockatoo; endangered) and *Calyptorhynchus banksii naso* (forest red-tailed cockatoo) may fly over the project area and may infrequently utilise the application area (Terrestrial Ecosystems 2020).
- *Falco peregrinus* (peregrine falcon), *Pandion haliaetus* (osprey) and *Apus pacificus* (fork-tailed swift) are not likely to be observed flying over the application area.
- A high abundance of *Oryctolagus cuniculus* (rabbits) and medium abundance of *Vulpes vulpes* (foxes) and *Felis catus* (cats) was observed (Terrestrial Ecosystems 2020).

Quenda typically prefer dense understorey vegetation (DEC 2012; DBCA 2017). It is understood that individuals have overlapping home ranges between 1-2 hectares. This species is known from eight records within the local area, with the nearest occurring approximately 0.9 kilometres from the application area. The fauna survey concluded that quenda potentially utilises the vegetation within the application area in low densities (Terrestrial Ecosystems 2020). Noting the proximity of the nearest record, quenda is likely to utilise the application area while moving through the landscape. Noting the extent of clearing proposed, the vegetation within the application area is not likely to be significant for the continued survival of this species.

Black-striped snake is a small-bodied, terrestrial burrowing snake that lives in Banksia woodlands and sandy areas of the Perth region (Western Australian Museum 2017). Black-striped snake is known from four records within the local area, with the nearest occurring approximately 5.1 kilometres from the application area. The fauna survey concluded that this species potentially utilises the vegetation within the application area. Noting the proximity of the nearest record, this species is likely to utilise the application area while moving through the landscape. Noting the extent of the clearing proposed and the proximity of the nearest record, the vegetation proposed to be cleared is not likely to be significant for the continued survival of this species.

The fauna survey identified that Carnaby's cockatoo and forest red-tailed cockatoo may occasionally utilise the project area (Terrestrial Ecosystems 2020). The vegetation within the application area is mapped within the known distribution range for Carnaby's cockatoo (DAWE 2022). This species prefers Proteaceous woodlands and shrublands and some non-native plants for foraging (DPAW 2013; DAWE 2022; EPA 2019; Shah 2006; Valentine and Stock 2008). Carnaby's cockatoo is known from 343 records within the local area, with the nearest occurring approximately 0.7 kilometres from the application area. The nearest mapped roosting record is situated approximately 6.3 kilometres from the application area. Carnaby's black-cockatoo were observed nearby to application area during site investigations (Terrestrial Ecosystems 2020). According to available databases, there are no records of forest red-tailed cockatoo within the local area, and the application area is not located within the known distribution range for this species (DAWE 2022).

The fauna survey identified that the vegetation within the application area does not provide preferred foraging, roosting or nesting habitat for Carnaby's cockatoo or forest red-tailed cockatoo (Terrestrial Ecosystems, 2020). Noting the proximity of nearest records, Carnaby's cockatoo are likely to utilise the application area while moving

through the landscape. However, given the lack of preferred foraging habitat and the extent of the proposed clearing, the vegetation proposed to be cleared is not likely to be significant. Given the above, vegetation within the application area is not likely to comprise significant foraging, breeding, or roosting habitat for Carnaby's cockatoo and forest red-tailed cockatoo.

The *Synemon gratiosa* (graceful sunmoth; Priority 4) is most common in sedgeland, heathlands, woodlands and occasionally within open parts of forest where their 'foodplants' (various grasses, sedges and mat-rushes) are found (DEC 2011). The species typically prefers Banksia woodland habitat that comprises *Lomandra hermaphrodita* or coastal heath comprising *Lomandra maritima* (DEC 2011). The graceful sunmoth is known from 83 records within the local area, with the nearest occurring approximately five kilometres from the application area. Given vegetation within the application area comprises areas of coastal heath with *Lomandra maritima* (One Tree Botanical, 2020), the application area may provide suitable habitat for the graceful sunmoth. Noting the extent of clearing proposed, the number and distribution of records, and that the vegetation within the application area is contiguous with adjacent remnant vegetation that provides similar habitat values, the vegetation within the application is not likely to comprise significant habitat for this species or the continued survival of this species.

The following noteworthy conservation significant fauna were also recorded within the local area (Appendix **Error! Reference source not found.**):

- *Austroconops mcmillani* (McMillan's biting midge (Swan Coastal Plain); Priority 2), known from eight (8) records between 1954 and 2011. The nearest record occurs approximately 8.9 kilometres from the application area.
- *Dasyurus geoffroyi* (chuditch; vulnerable), known from two records within the nearest occurring approximately 9.6 kilometres from the application area.
- Swan Coastal Plain shield-backed trapdoor spider (*Idiosoma sigillatum*; Priority 3), known from one record within the local area, approximately 9.6 kilometres from the application area.
- *Tyto novaehollandiae novaehollandiae* (masked owl (southwest); Priority 3), known from one record within the local area, approximately 9.6 kilometres from the application area.
- *Delma concinna major* (javelin legless lizard (Shark Bay); Priority 1), known from one record within the local area, approximately 9.7 kilometres from the application area.

Noting the extent and distribution of the above records, preferred habitat types, and extent of clearing proposed, the vegetation within the application is not likely to comprise significant habitat for the above listed species.

The vegetation within the application area likely provides suitable habitat for quenda (Priority 4) and black-striped snake (Priority 3). The proposed clearing of 1.43 hectares will further reduce available habitat for fauna species. The clearing and construction of the beach access has the potential to fragment ecological connectivity and faunal movements within the landscape. However the cleared area that will remain post revegetation will not inhibit fauna movement. The clearing could result in the introduction or spread of weeds and dieback into adjacent vegetation, which could further impact habitat quality and connectivity.

Significant habitat refers to the resources (breeding, resting and feeding), connectivity or habitat area for a species or community that is critical for its survival. Noting the extent and purpose of the proposed clearing, and its location within a broader remnant, and the applicant's proposed revegetation of temporary clearing and offset area, the vegetation within the application area is not likely to be significant for the survival of indigenous fauna or necessary for the maintenance of significant habitat. Whilst the application area does not comprise of significant habitat for fauna, there is the potential for individuals to be present at the time of clearing.

Conclusion: Based on the above assessment, and the avoidance and mitigation measures provided by the applicant (Section 3.1), it is considered that the potential impacts of the proposed clearing to fauna and fauna habitat can be managed by:

- taking steps to ensure that the impact of clearing on any individuals present is minimised
- ensuring the proposed fencing does not impede fauna movements
- minimising the risk of introduction and spread of weeds and dieback into adjacent fauna habitat
- rehabilitating the temporary cleared areas and offset site to ensure fauna habitat to reduce the area of lost habitat.

Conditions: To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Implement slow and directional clearing to allow any fauna present to move into adjacent vegetation ahead of the clearing activity.
- Install conservation style fencing that allows for the movement of fauna by being raised at least 15 centimetres from the ground.

- Provision of an offset (Section 4) for the significant residual impacts to Bush Forever site 397, representing a significant remnant of native vegetation and provides suitable habitat for conservation significant flora, fauna and communities.
- Implement weed and dieback management measures to mitigate impacts to adjacent vegetation and fauna habitat.

3.2.3. Environmental value: Significant remnant and conservation areas - Clearing Principles (e) and (h)

Assessment: The vegetation within the application area intersects approximately 1.42 hectares of Bush Forever area 397 (Coastal Strip from Wilbinga to Mindarie). of Bush Forever area 397 is approximately 400 hectares in size (Government of Western Australia 2020). The vegetation within the application area also forms part of the Gngangara Sustainability Strategy (GSS) Ecological Linkages (Brown et al. 2009), associated with the mapped Bush Forever site. The flora and vegetation survey determined that the majority of the application area ranges from good to excellent (Keighery 1994) condition (One Tree Botanical 2020). The proposed clearing will impact on the environmental values of this Bush Forever area through the direct removal of vegetation and the potential introduction and spread of weeds and dieback.

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present prior to the year 1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001). The application area is located within the Swan Coastal Plain bioregion as described by Thackway and Cresswell (1995). The Swan Coastal Plain (IBRA) bioregion retains approximately 38.6 per cent of its pre-European vegetation extent (Government of Western Australia 2019a). The vegetation within the application area is mapped within the Quindalup vegetation complex (Hedde et al 1980), which retains approximately 60.5 per cent of its pre-European extent (Government of Western Australia 2019b). Approximately 35.2 per cent of the native vegetation has been retained within the local area, defined as a ten kilometre radius from the application area (Appendix C.2; Government of Western Australia 2019a).

The Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region as a constrained area, which provides for the reduction of vegetation complexes to a minimum of 10 per cent of their pre-European extent (EPA 2008). However, Bush Forever is a strategic plan that proposes to protect at least 10 per cent of each of the original 26 vegetation complexes of the Swan Coastal Plain within the Perth Metropolitan Region, with a target of 20 per cent for the Quindalup vegetation complex (Government of Western Australia 2000a).

The proposed clearing of 1.43 hectares of native vegetation is likely to impact the environmental values of a conservation area (Bush Forever Site 397), and potentially fragment ecological connectivity within the landscape. The proposed clearing activities may result in the introduction or spread of weeds and dieback into adjacent vegetation, which could impact habitat quality and connectivity.

Conclusion: For the reasons set out above, it is considered that the impacts of the proposed clearing on Bush Forever area 397 can be managed by taking steps to minimise the risk of the introduction and spread of weeds, slow directional clearing to allow fauna to move into adjacent vegetation, and rehabilitating temporary cleared areas post works to ensure vegetation is not permanently lost. The loss of 0.65 hectares of permanently cleared vegetation constitutes a significant residual impact.

To ensure the integrity of Bush Forever area 397 is upheld and the proposed clearing is consistent with SPP 2.8, the DPLH (2020) recommends that an offset package is prepared, prior to clearing of native vegetation in accordance with the Western Australian Environmental Offset Policy (Government of Western Australia 2011) and with guidance from Appendix 4 of SPP 2.8 (DPLH 2020).

Conditions: To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- A revegetation condition requiring the revegetation of 0.78 hectares of temporary cleared areas.
- Provision of an offset (Section 4) for the significant residual impacts to Bush Forever site 397 that also provides suitable habitat for conservation significant flora, vegetation and fauna.
- A weed and dieback condition to mitigate impacts to adjacent vegetation.

3.2.4. Environmental value: Land resources - Clearing Principle (g)

Assessment: The application area is located within the Quindalup Dunes which are calcareous sands formed into parabolic dunes and beach ridge plains, that are Holocene in age. Soils comprise rapidly drained calcareous sands. The subsurface acidification, waterlogging, flooding and salinity has been assessed to be low risk (DPIRD 2019; Appendix 0). Water erosion risk ranges from low to high, and phosphorus export risk from moderate to high (DPIRD 2019). There is a moderate to high risk of wind erosion in all the mapped soil units. Standard design features and construction management strategies will mitigate potential land degradation risks.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the applicant (Section 3.1), it is considered that the potential impacts of the proposed clearing on land and water resources can be managed by the implementation of wind erosion management strategies.

Conditions: To address the above impacts, a wind erosion management condition, for construction works to begin within two months of clearing will mitigate impacts of the proposed clearing on adjacent vegetation.

3.3. Relevant planning instruments and other matters

The application area is located within Bush Forever area 397 - Coastal Strip from Wilbinga to Mindarie. SPP 2.8 sets out that proposals and decision making in respect of Bush Forever areas should support a general presumption against the clearing of regionally significant bushland or other degrading activities, except where a proposal or decision is consistent with the overall purpose and intent of the existing Crown reserve, or can be reasonably justified with regard to wider environmental, social, economic or recreational needs (clause 5.1.2.1(i)(e)). The Policy also sets out that unavoidable adverse impacts on regionally significant bushland within a Bush Forever area should be offset at a ratio of at least 1:1 in habitat hectares.

DPLH advised site implementation category for Bush Forever Area 397 is classified as "Bush Forever Reserves" (existing or proposed) under SPP 2.8. Under Clause 5.1.2.1 (i) (e) of SPP 2.8, proposals or decision making should seek to support a general presumption against the clearing of regionally significant bushland or other degrading activities, except where a proposal or decision is justified with regard to wider social or recreational needs (DPLH 2020). It was recognised that the proposed application will benefit the wider recreational needs of the community and as such is consistent with SPP 2.8 (DPLH 2022).

DPLH recommended the following to ensure the integrity of Bush Forever area 397 is not compromised, in accordance with SPP 2.8 section 5.1.1 (ii) and 5.1.2.1 (e), Land Use Planning Policy (DPLH, 2020):

- An offset package is prepared and approved by DWER prior to the clearing of any native vegetation, in accordance with the WA Environmental Offsets Policy (2011) and Appendix 4 of SPP 2.8. It is recommended that there is an environmental gain for any clearing undertaken, i.e. at least 2 x the calculated loss in habitat hectares, which can include revegetation. It would be preferable that the offset measures are provided onsite at Bush Forever area 397.
- Other than the 1.42 ha of native vegetation proposed to be cleared, the development including construction, access, drainage, battering and ongoing maintenance shall not result in further disturbance or clearing of any native vegetation within Bush Forever area 397
- Fencing, where considered appropriate, be installed to mitigate any adverse impacts from pedestrian traffic on Bush Forever area 397.

Due to the avoidance and mitigation measures implemented by the applicant (Section **Error! Reference source not found.**), the significance and proportion of impacts to conservation significant flora, communities and fauna (Section **Error! Reference source not found.**), and the conditions placed on the permit to manage and mitigate these impacts, the application did not require referral to DBCA.

No known Aboriginal sites of significance are mapped within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972 (WA)* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

4 Suitability of offsets

Through the detailed assessment outlined in Section 3.2 above, the Delegated Officer has determined that the following significant residual impacts remain after the application of the avoidance and mitigation measures summarised in Section 3.1:

- The permanent loss of 0.65 hectares of Bush Forever site 397 and representing suitable habitat for:
 - two Priority 3 PECs, including 0.12 hectares of the '*Northern Spearwood shrublands and woodlands*' and 0.95 hectares of the '*Coastal shrublands on shallow sands, southern Swan Coastal Plain*' communities; and
 - conservation significant fauna, including quenda (Priority 4) and black-striped snake (Priority 3).

DPLH advised that to ensure the integrity of Bush Forever Area 397 is not compromised, an offset package should be prepared in accordance with the WA Environmental Offsets Policy (2011) and Appendix 4 of SPP 2.8 (Section 3.3). Given the proposed clearing area comprises 1.43 hectares of native vegetation and the proposed revegetation of 0.78 hectares, 0.65 hectares will remain unvegetated. Therefore, applying the required 2:1 ratio, a 1.3 hectare offset is necessary.

The applicant has submitted a revegetation plan consistent with DWER's guide to preparing revegetation plans for clearing permits under Part V of the EP Act (DWER 2018), including an offset proposal consistent with the WA

Environmental Offsets Policy (2011) (City of Wanneroo, 2022c). The revegetation plan includes site preparation, revegetation methodology, species lists, completion criteria, monitoring, contingency as well as an implementation schedule and indicative costings. The City of Wanneroo has committed to an offset to rehabilitate and revegetate 1.475 hectares of Bush Forever area 397 (Coastal Strip from Wilbinga to Mindarie) (Section **Error! Reference source not found.**), which exceeds the required 2:1 offset ratio (City of Wanneroo 2022c). The additional rehabilitation and revegetation offset area provided may be banked for future use by the City of Wanneroo.

The proposed offset site is situated within two separate land parcels managed by the City of Wanneroo, and zoned for Parks and Recreation under the Metropolitan Region Scheme, including Lot 13321 on Deposited Plan 21931 and Lot 15452 on Deposited Plan 40341, Two Rocks (Figure 6; City of Wanneroo 2022c). The rehabilitation and revegetation of 1.475 hectares of the offset site is primarily located within Bush Forever area 397. The offset site comprises an existing dune blowout and weed infested area, primarily in degraded condition (City of Wanneroo 2022c).

A site assessment verified that the offset site ranged from degraded to good vegetation condition, based on the South West Botanical Province (EPA 2016) and Bush Forever (Keighery 1994 from Government of Western Australia 2000) vegetation condition scale (City of Wanneroo 2022c). The use of unauthorised 4WD tracks was evident during the offset site inspection and through review of aerial imagery (City of Wanneroo 2022c). The main contributing factor to the degraded condition of the site is the use of unauthorised vehicles in the area and the increased invasion of weed species on the site (City of Wanneroo 2022c). The rehabilitation of this site would be a beneficial contribution to the Two Rocks foreshore area to the south of the Marina and assist in remediating the overall continual degradation of this vegetation (City of Wanneroo 2022c).

The revegetation of the offset site will positively contribute to the overall ecological value of this site, and the fencing and conservation of this site will further deter and restrict unauthorised vehicles impacting the site (City of Wanneroo 2022c). Conservation style fencing will be installed that allows for the movement of fauna by being raised at least 15 centimetres from the ground.

The proposed offset has been developed in accordance with the WA State Government's Environmental Offsets Policy and Environmental Offsets Guidelines and conforms with DPLH advice and SPP 2.8.

The Delegated Officer concluded that the offset provided adequately counterbalances the significant residual impacts identified. The offset considered in accordance with the WA State Government's Environmental Offsets Policy and Environmental Offsets Guidelines and SPP 2.8.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
Provision of a revised revegetation and rehabilitation plan, including offset proposal and appendices.	City of Wanneroo (2020c), received 12 August 2022
Provision of offset area shapefiles	City of Wanneroo (2022d), received 3 October 2022

Appendix B. Details of public submissions

Public Submission (1)

Summary of comments	Consideration of comment
Concerns were raised regarding further native vegetation habitat loss and fragmentation of coastal dune vegetation in urban areas that is substantially cleared and degraded.	Assessment of the proposed clearing against the ten clearing principles is provided in Appendix D. The assessment of impacts to flora, vegetation and fauna and proposed management and mitigation measures, and conditioning to address these impacts are addressed within Section 3.1 and Section 3.2 of the decision report.
Concerns were raised that the applicant had not demonstrated that other already disturbed areas were considered	The applicant's justification for the proposed beach access and avoidance and minimisation measures is summarised in Section Error! Reference source not found. of the decision report. Three options were considered by the applicant. The alignment has been selected based on creating a shorter overall length with less clearing (see Section 3.1). The clearing area has been reduced from 3.78 hectares within a 12.68 hectare footprint, to 1.43 hectares, of which 0.78 hectares will be revegetated. The access includes a pathway from the carpark, which will be fenced to restrict unauthorised access by pedestrians and vehicles, as per the conditions on CPS 9578/1 permit and detailed in Section 3.2
Impacts to resident bird populations including the territorial White-winged Fairy Wren (<i>Malurus leucopterus</i>)	The assessment of impacts vegetation and fauna and proposed management and mitigation measures, and conditioning to address these impacts are addressed within Section 3.1 and Section 3.2 of the decision report. The clearing area has been reduced from 3.78 hectares within a 12.68 hectare footprint, to 1.43 hectares, of which 0.78 hectares will be revegetated. To counter-balance residual impacts, an offset will be provided that involves the revegetation, protection, and ongoing management of 1.475 hectares of coastal native vegetation within Bush Forever Site 397 (see Section 4). A 2:1 offset ratio was applied. Impacts to fauna species were not deemed to be significant (see section 3.2.2).

Public Submission (2)

Summary of comments	Consideration of comment
Concerns were raised regarding to impacts to Bush Forever Area 397 noting that these areas are supposed to be fully protected for biodiversity conservation and therefore no clearing should be permitted.	The applicant's justification for the proposed beach access is summarised in Section Error! Reference source not found. of the decision report. Avoidance and minimisation measures applied by the applicant are summarised within Section 3.2 of the decision report. To counter-balance residual impacts, an offset will be provided that involves the revegetation, protection, and ongoing management of 1.475 hectares of coastal native vegetation within Bush Forever Site 397 (see Section 4). A 2:1 offset ratio was applied, consistent with SPP 2.8.

Appendix C. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix D.

C.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the intensive land use zone of Western Australia. It is adjacent to remnant native vegetation that extends south to north along the coastline. The application area is bound by the Indian Ocean to the west and Two Rocks Road to the east. Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 35 per cent of the original native vegetation cover. The application area forms part of a larger UXO area known as 'Yanchep Two Rocks Artillery Range' (City of Wanneroo, 2022b).
Ecological linkage	The application area intersects approximately 1.42 hectares of Bush Forever area 397 (Coastal Strip from Wilbinga to Mindarie). Approximately 1.26 hectares of the application is situated within an Environmentally Sensitive Area (ESA) associated with this Bush Forever area (Government of Western Australia 2000). A conceptual linkage of the Gngangara Mound Ecological Linkage is also mapped over the application area.
Conservation areas	The application area occurs within Bush Forever area 397 (Coastal Strip from Wilbinga to Mindarie). Gngangara-Moore River State Forest and Yanchep National Park are located approximately 5.6 kilometres east from the application area.
Vegetation description	<p>A flora and vegetation survey (One Tree Botanical 2020) indicate the vegetation within the proposed clearing area consists of the following seven vegetation types:</p> <ul style="list-style-type: none"> • A1: Incipient Foredune (younger): Uniform regrowth of Grassland *<i>Thinopyrum distichum</i>; • A2: Established Foredune (older): Sparse Shrubland <i>Olearia axillaris</i> over Grassland <i>Spinifex longifolius</i>. • A3: Beach-ridge Plain: Open Shrubland <i>Olearia axillaris</i>, <i>Rhagodia baccata</i> subsp. <i>baccata</i> and *<i>Pelargonium capitatum</i> over Sparse Grassland <i>Spinifex longifolius</i> and Sparse Vineland <i>Cassyltha flava</i> var. <i>flava</i>. • B1: Shrubland dominated by <i>Acacia cyclops</i>, <i>Scaevola crassifolia</i>, <i>Spyridium globulosum</i>, <i>Santalum acuminatum</i>, <i>Myoporum insulare</i>, <i>Olearia axillaris</i>, <i>Rhagodia baccata</i> subsp. <i>baccata</i> and <i>Acanthocarpus preissii</i>, Sparse Vineland <i>Hardenbergia comptoniana</i> and <i>Cassyltha flava</i> var. <i>flava</i>. Over Forbland dominated by <i>Senecio pinnatifolius</i> var. <i>latilobus</i>. • C1: Species rich low Shrubland dominated by <i>Melaleuca systema</i> and species rich Forbland dominated by <i>Lomandra maritima</i> and Sparse Sedgeland <i>Lepidosperma calcicola</i> and Sparse Rushland <i>Desmocladius asper</i>. • D1: Closed Shrubland <i>Melaleuca cardiophylla</i> with other typical shrubs <i>Melaleuca huegelii</i> subsp. <i>huegelii</i>, <i>Acacia xanthina</i> and <i>Dodonaea aptera</i> with Sparse Vineland <i>Cassyltha aurea</i> var. <i>aurea</i> over Forbland of native and introduced herbs. • E1: Historically cleared areas; informal walking paths, informal vehicular sand tacks (unused and partially overgrown). <p>The vegetation types mapped over the application area during the flora and vegetation survey are available in Appendix F.</p> <p>These vegetation types are partially consistent with Quindalup Complex vegetation type mapped over the application area, which is described as coastal dune complex consisting mainly of two alliances - the strand and fore-dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of <i>Melaleuca lanceolata</i> (Rottnest Teatree) - <i>Callitris preissii</i> (Rottnest Island Pine), the closed scrub</p>

Characteristic	Details																																								
	<p>of <i>Acacia rostellifera</i> (Summer-scented Wattle) and the low closed <i>Agonis flexuosa</i> (Peppermint) forest of Geographe Bay (Heddle et al. 1980).</p> <p>The mapped vegetation type retains approximately 60 per cent of the original extent (Government of Western Australia, 2019b).</p>																																								
Vegetation condition	A flora and vegetation survey conducted by One Tree Botanical (2020) identified the vegetation within the proposed clearing area to be in excellent to degraded (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix E. Survey descriptions and mapping are available in Appendix F.																																								
Climate and landform	<p>The climate of the application area is warm and temperate. The annual average rainfall is approximately 800 millimetres. Evapotranspiration over the application area is approximately 700 millimetres.</p> <p>The geology mapped over the application area is characterised by alluvial, shoreline, and eolian deposits. The groundwater salinity within the application area typically ranges</p>																																								
Soil description	<p>The soils mapped over the application area include the following:</p> <ul style="list-style-type: none"> • Quindalup South shallow sand flat Phase (211Qu_Qs), described as undulating landscapes with shallow calcareous sands over limestone and much rock outcrop. • Quindalup South third dune Phase (211Qu_Q3), described as the third phase. Irregular dunes with high relief and slopes up to 20%. Loose calcareous sand with little surface organic staining and incipient cementation at depth. • Quindalup South youngest dune Phase (211Qu_Q4), described as the youngest phase. Irregular dunes with slopes up to 20%. Loose pale brown calcareous sand with no soil profile development. • Quindalup South water, beach Phase (211QuU_Beach), described as beach. 																																								
Land degradation risk	<p>The degradation risk factors mapped over the application area are detailed below:</p> <table border="1"> <thead> <tr> <th>Risk Categories</th> <th>211Qu_Qs</th> <th>211Qu_Q3</th> <th>211Qu_Q4</th> <th>211QuU_Beach</th> </tr> </thead> <tbody> <tr> <td>Wind erosion</td> <td>Moderate (M2)</td> <td>High (H1)</td> <td>High (H2)</td> <td>High (H2)</td> </tr> <tr> <td>Water erosion</td> <td>High (H1)</td> <td>Moderate (M1)</td> <td>Moderate (M2)</td> <td>Low (L1)</td> </tr> <tr> <td>Waterlogging</td> <td>Low (L1)</td> <td>Low (L1)</td> <td>Low (L2)</td> <td>Low (L1)</td> </tr> <tr> <td>Subsurface acidification</td> <td>Low (L1)</td> <td>Low (L1)</td> <td>Low (L1)</td> <td>Low (L1)</td> </tr> <tr> <td>Phosphorus export</td> <td>High (H1)</td> <td>Moderate (M2)</td> <td>Moderate (M2)</td> <td>High (H2)</td> </tr> <tr> <td>Salinity risk</td> <td>Low (L1)</td> <td>Low (L1)</td> <td>Low (L1)</td> <td>Low (L1)</td> </tr> <tr> <td>Flooding</td> <td>Low (L1)</td> <td>Low (L1)</td> <td>Low (L1)</td> <td>Low (L1)</td> </tr> </tbody> </table>	Risk Categories	211Qu_Qs	211Qu_Q3	211Qu_Q4	211QuU_Beach	Wind erosion	Moderate (M2)	High (H1)	High (H2)	High (H2)	Water erosion	High (H1)	Moderate (M1)	Moderate (M2)	Low (L1)	Waterlogging	Low (L1)	Low (L1)	Low (L2)	Low (L1)	Subsurface acidification	Low (L1)	Low (L1)	Low (L1)	Low (L1)	Phosphorus export	High (H1)	Moderate (M2)	Moderate (M2)	High (H2)	Salinity risk	Low (L1)	Low (L1)	Low (L1)	Low (L1)	Flooding	Low (L1)	Low (L1)	Low (L1)	Low (L1)
Risk Categories	211Qu_Qs	211Qu_Q3	211Qu_Q4	211QuU_Beach																																					
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Waterlogging	Low (L1)	Low (L1)	Low (L2)	Low (L1)																																					
Subsurface acidification	Low (L1)	Low (L1)	Low (L1)	Low (L1)																																					
Phosphorus export	High (H1)	Moderate (M2)	Moderate (M2)	High (H2)																																					
Salinity risk	Low (L1)	Low (L1)	Low (L1)	Low (L1)																																					
Flooding	Low (L1)	Low (L1)	Low (L1)	Low (L1)																																					
Waterbodies	No watercourse or wetlands are mapped within proximity to the application area. The nearest mapped wetland is a conservation category wetland located approximately 6.6 kilometres east from the application area. The Indian Ocean is located directly west from the application area.																																								
Hydrogeography	The application area is mapped within Yanchep Groundwater Area proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> .																																								
Flora	According to available databases, 19 flora of conservation significance have been recorded within the local area, comprising one Threatened, one Priority 1, Four Priority 2, ten Priority 3 and three Priority 4 flora taxa. A flora and vegetation survey undertaken identified four individuals of <i>Beyeria cinerea</i> subsp. <i>cinerea</i> (Priority 3) within the application area (One Tree Botanical 2020). Other records of this species, and two other priority taxa were recorded within close proximity to the application area, including <i>Leucopogon maritimus</i> (Priority 1) and <i>Stylidium maritimum</i> (Priority 3) (One Tree Botanical 2020).																																								

Characteristic	Details
Ecological communities	According to available databases, four conservation significant ecological communities have been mapped within the local area. None of these records occur over the application area. A flora and vegetation survey undertaken within the application area identified two PECs within the application area including Coastal shrublands on shallow sands, southern Swan Coastal Plain ('floristic community type 29a' (Priority 3) and Northern Spearwood shrublands and woodlands ('floristic community type 24') (Priority 3). No threatened ecological communities protected under the BC Act or the EPBC Act were recorded within or adjacent to the application area (One Tree Botanical 2020).
Fauna	According to available databases, 25 conservation significant fauna species have been recorded within the local area comprising 12 Threatened, one Priority 1, one Priority 2, three Priority 3, three Priority 4, three specially protected Migratory species and one other specially protected species (OS) and one specially protected species (conservation dependent; CD), fauna taxa. None of these records occur over the application area. Of these, 13 fauna are associated with marine, estuarine or freshwater habitats that do not occur within the application area. The nearest records are <i>Isoodon fusciventer</i> (quenda; Priority 4) and <i>Calyptorhynchus latirostris</i> (Carnaby's cockatoo; endangered) located approximately 0.9 kilometres and 0.74 kilometres from the application area, respectively. The nearest confirmed black cockatoo roost site is located approximately 0.6 kilometres from the application area. A vertebrate fauna survey conducted within the application area identified that the vegetation within the application area may provide suitable habitat for quenda, <i>Neelaps calonotos</i> (black striped snake; Priority 3) (Terrestrial Ecosystems 2020). Carnaby's and forest red-tailed cockatoo may fly over the project area and may infrequently utilise the project area (Terrestrial Ecosystems 2020). The vegetation within the application area does not provide preferred foraging, roosting or breeding habitat for these species (Terrestrial Ecosystems 2020).

C.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.6	222,916.97	14.85
Vegetation complex					
Quindalup Complex	54,573.87	33,011.64	60.5	5,994.64	11
Local area					
10km radius	32,824.11	11,568.86	35.2	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

C.3. Flora analysis table

Species name	Conservation status	Suitable soil & vegetation types	Number of known records in local area (total)	Are surveys adequate to identify?
Conservation significant flora				
<i>Conostylis pauciflora</i> subsp. <i>euryrhipis</i>	Priority 4	Yes	10	Yes
<i>Leucopogon maritimus</i>	Priority 1	Yes	15	No
<i>Stylidium maritimum</i>	Priority 3	Yes	10	Yes
<i>Acacia benthamii</i>	Priority 2	No	5	Yes
<i>Calandrinia oraria</i>	Priority 3	No	1	Yes
<i>Conostylis bracteata</i>	Priority 3	No	1	Yes
<i>Eucalyptus argutifolia</i>	Vulnerable	No	6	Yes
<i>Hibbertia leptotheca</i>	Priority 3	No	3	Yes
<i>Lasiopetalum membranaceum</i>	Priority 3	No	1	Yes
<i>Lecania sylvestris</i>	Priority 2	No	1	Yes
<i>Lecania turicensis</i> var. <i>turicensis</i>	Priority 2	No	1	Yes
<i>Lepidium pseudotasmanicum</i>	Priority 4	No	3	Yes
<i>Leucopogon</i> sp. <i>Yanchep</i> (M. Hislop 1986)	Priority 3	No	13	Yes
<i>Pimelea calcicola</i>	Priority 3	No	4	Yes
<i>Placynthium nigrum</i>	Priority 3	No	1	Yes
<i>Rinodina bischoffii</i>	Priority 2	No	1	Yes
<i>Sphaerolobium calcicola</i>	Priority 3	No	2	Yes
<i>Styphelia filifolia</i>	Priority 3	No	1	Yes
<i>Eucalyptus foecunda</i> subsp. <i>foecunda</i>	Priority 4	No	1	Yes

C.4. Fauna analysis table

Species name	Conservation status	Suitable habitat features?	Approximate distance to nearest record (km)	Number of known records (total)	Are surveys adequate to identify?
<i>Calyptorhynchus latirostris</i> (Carnaby's Black-Cockatoo)	Endangered	Yes	0.7	343	Yes
<i>Austroconops mcmillani</i> (McMillan's biting midge (Swan Coastal Plain))	Priority 2	Yes	8.9	8	No
<i>Dasyurus geoffroii</i> (chuditch)	Vulnerable	Yes	9.6	2	Yes
<i>Delma concinna major</i> (javelin legless lizard (Shark Bay))	Priority 1	Yes	9.7	1	Yes
<i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)	Priority 3	Yes	9.6	1	No
<i>Isoodon fusciventer</i> (quenda)	Priority 4	Yes	0.9	8	Yes
<i>Neelaps calonotos</i> (black-striped snake)	Priority 3	Yes	5.0	4	Yes
<i>Synemon gratiosa</i> (graceful sunmoth)	Priority 4	Yes	5.0	83	No
<i>Tyto novaehollandiae novaehollandiae</i> (masked owl (southwest))	Priority 3	Yes	9.6	1	Yes

Species name	Conservation status	Suitable habitat features?	Approximate distance to nearest record (km)	Number of known records (total)	Are surveys adequate to identify?
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T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

C.5. Ecological community analysis table

Species name	Conservation status	Approximate distance to nearest record (km)	Number of known records (total)	Are surveys adequate to identify?
<i>Melaleuca huegelii</i> - <i>Melaleuca systema</i> shrublands on limestone ridges (floristic community type 26a as originally described in Gibson et al. (1994))	Endangered	7.0	11	Yes
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	3.4	191	Yes
Tuart (<i>Eucalyptus gomphocephala</i>) woodlands and forests of the Swan Coastal Plain	Priority 3	6.8	63	Yes
Aquatic Root Mat Community Number 1 of Caves of the Swan Coastal Plain	Critically Endangered	9.6	4	Yes

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> “Native vegetation should not be cleared if it comprises a high level of biodiversity.”</p> <p><u>Assessment</u></p> <p>A flora and vegetation survey identified four individuals of <i>Beyeria cinerea</i> subsp. <i>cinerea</i> (Priority 3) within the application area (One Tree Botanical, 2020). <i>Leucopogon maritimus</i> (Priority 1) and <i>Stylidium maritimum</i> (Priority 3) were recorded within close proximity to the application area (One Tree Botanical 2020). ‘Coastal shrublands on shallow sands, southern Swan Coastal Plain’ (‘floristic community type 29a; Priority 3) and ‘Northern Spearwood shrublands and woodlands’ (floristic community type 24; Priority 3) priority ecological communities were recorded within the application area (One Tree Botanical 2020).</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> “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.”</p> <p><u>Assessment:</u></p> <p>The vegetation within the application area may provide suitable habitat for conservation significant fauna, including <i>Isodon fusciventer</i> (quenda; Priority 4), <i>Neelaps calonotos</i> (black-striped snake; Priority 3) and <i>Synemon gratiosa</i> (graceful sunmoth; Priority 4).</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> “Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</p> <p><u>Assessment:</u></p> <p>One Threatened flora taxa, <i>Eucalyptus argutifolia</i> (vulnerable), was recorded from six records within the local area. None of these records occur over the application area. The records of this species are from different mapped soil and vegetation types to those found within the application area. The flora and vegetation survey did not record any threatened flora within the application area (One Tree Botanical 2020). The vegetation within the application is not likely to include or be necessary for the continued existence of threatened flora (One Tree Botanical 2020).</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (d):</u> “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><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain species that can indicate a threatened ecological community (TEC). The flora and vegetation survey did not record any TECs within the application area (One Tree Botanical 2020). The vegetation within the application area is not likely to comprise the whole or a part of, or be necessary for the maintenance of, a TEC.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> “Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</p> <p><u>Assessment:</u></p> <p>The retention and extent of the mapped vegetation type and native vegetation in the local area is consistent with the national objectives and</p>	May be at variance	Yes <i>Refer to Section 3.2.3, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>targets for biodiversity conservation in Australia and the application area is not considered to occur within an extensively cleared landscape.</p>		
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The application area occurs within Bush Forever area 397 (Coastal Strip from Wilbinga to Mindarie). The clearing will impact this conservation area through the direct clearing of native vegetation. There is potential that the proposed clearing activities could result in the introduction or spread of weeds and dieback into adjacent vegetation, which could impact habitat quality and connectivity.</p>	At variance	<p>Yes</p> <p><i>Refer to Section 3.2.3, above.</i></p>
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>The application area is located adjacent to the Indian Ocean. Given no watercourses or wetlands are mapped within close proximity of the application area, the proposed clearing is not likely to impact on- or off-site hydrology and water quality. The vegetation proposed to be cleared is not likely growing in or in association with a wetland or watercourse.</p>	Not likely to be at variance	<p>No</p> <p><i>Refer to Section 3.2.3, above.</i></p>
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils are susceptible to wind erosion. The clearing of 1.43 hectares of native vegetation may cause land degradation in the form of wind erosion. Noting the extent and purpose of the clearing proposed, the location within the broader remnant, the revegetation proposed for temporary cleared areas following the construction of the beach access track, the proposed clearing is unlikely to cause appreciable land degradation in the long term. An erosion management condition has been placed on the permit.</p>	May be at variance	<p>Yes</p> <p><i>Refer to Section 3.2.4, above.</i></p>
<p><u>Principle (i):</u> <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><u>Assessment:</u></p> <p>Given no watercourses or wetlands are recorded within close proximity of the application area, the proposed clearing is unlikely to impact surface water quality. Given the low salinity level and extent of native vegetation in the local area, the proposed clearing is not likely to increase groundwater salinity or cause deterioration in the quality of groundwater.</p>	Not likely to be at variance	<p>No</p>
<p><u>Principle (j):</u> <i>“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><u>Assessment:</u></p> <p>The mapped soils and topographic contours in the surrounding area indicate the proposed clearing is not likely to contribute to increased incidence or</p>	Not likely to be at variance	<p>No</p>

Assessment against the clearing principles	Variance level	Is further consideration required?
intensity of flooding. The un-mapped sandy soil associated with the dune is also likely to have a low flood risk.		

Appendix E. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix F. Biological survey information excerpts

F.1. Flora and vegetation survey (One Tree Botanical 2020)

Overview

One Tree Botanical Pty Ltd (One Tree Botanical 2020) conducted detailed survey and targeted flora and vegetation survey. Sampling techniques consisted of traverses, quadrats, opportunistic sampling and vegetation condition rating. A traverse survey was completed on the 27 September 2019. Traverses were conducted on foot at 20 metre intervals across all vegetated areas to record:

- Priority, Threatened and other flora of conservation significance (as defined by EPA 2016);
- Weed species;
- Vegetation type and condition boundaries; and
- Any matters of interest, including but not limited to rubbish, vegetation, condition (One Tree Botanical 2020).

An early spring quadrat survey was conducted on the 13-16 September 2019, with a late spring revisit on the 19 October 2019. The study area is approximately 12 hectares in size and includes portions of foreshore reserve in Two Rocks south of the Marina, bound by the Indian Ocean to the west and Two Rocks Road to the east (One Tree Botanical 2020).

Flora

A total of 160 taxa were recorded from the study area, of which 100 or 63 per cent were natives. A search of the Department of Biodiversity, Conservation and Attractions (DBCA) threatened species and communities database did not identify any records of state listed threatened or priority flora previously known from within the study area boundaries (One Tree Botanical 2020). A search of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (Department of Environment and Energy 2019) listed nine Threatened flora as potentially occurring in the region (One Tree Botanical 2020). None of these species have previously been recorded from within the study area (One Tree Botanical 2020).

No Threatened flora species protected under the *Biodiversity Conservation Act 2016* (BC Act) or EPBC Act were recorded during the field survey (One Tree Botanical 2020). Three Priority Flora species were recorded from the study area during the survey, including one Priority 1 species *Leucopogon maritimus* and two Priority 3 species *Beyeria cinerea* subsp. *cinerea* and *Stylidium maritimum*:

- *Leucopogon maritimus* (Priority 1) is a low spreading shrub to 40cm tall by 60cm wide from the heath family (Ericaceae). There are 17 collections of this species in the WA Herbarium (Council of Heads of Australasian Herbaria, 2013) known from a small range in a narrow coastal band from Alkimos to north of Two Rocks. During the survey approximately 13 individuals were recorded from the study area (Figure 1). The distribution of this plant in the study area was restricted to Vegetation Type C (Figure 2; (One Tree Botanical 2020).
- *Beyeria cinerea* subsp. *cinerea* (Priority 3) is an open, erect to spreading shrub (Plate 3) to 70cm tall from the spurge family (Euphorbiaceae). There are 51 collections of this species in the WA Herbarium (Council of Heads of Australasian Herbaria, 2013) distributed in a narrow near-coastal band between Mandurah and Port Gregory. During the survey 490 individuals were recorded from the study area (Figure 1). The distribution of this plant in the study area was restricted to Vegetation Type C (Figure 2; One Tree Botanical 2020).
- *Stylidium maritimum* (Priority 3) is a perennial herb to 70cm tall, with tufted linear strappy grass-like leaves from the triggerplant family (Stylidiaceae). There are 42 collections of this species in the WA Herbarium (Council of Heads of Australasian Herbaria 2013) distributed in a narrow near-coastal band between Mandurah and Leeman. During the survey 35 individuals were recorded from the study area (Figure 3). The distribution of this plant in the study area was restricted to Vegetation Type C (Figure 2; One Tree Botanical 2020).

Of the 60 species of weed recorded in the study area, nine were given a High rating for invasiveness and spread as environmental weeds under the Western Australian Environmental Weed Strategy (WAEWS) (Department of Conservation and Land Management, 1999; One Tree Botanical 2020). Thirty weeds recorded in the study area were given a Moderate rating (One Tree Botanical, 2020). There are no Declared Pest species recorded from the WA Organism List (WAOL) under the *Biosecurity and Agriculture Management Act 2007* or Weeds of National Significance (WONS) in the application area (One Tree Botanical 2020).

Potential dieback was not indicated in the 2019 biological surveys for the Two Rocks beach access (One Tree Botanical 2020) however, a formal dieback assessment has not been undertaken. Potential exists for *Phytophthora*

sp. and other potential pathogens (such as *Armillaria luteobubalina*) to be introduced as part of the construction process, but standard dieback and vehicle hygiene measures are considered appropriate to mitigate this risk (One Tree Botanical 2020). No significant impact is anticipated related to dieback from the Two Rocks beach access, either directly or indirectly (One Tree Botanical,2020).

Vegetation

Seven vegetation types were identified within the study area, including:

A: LOW-LYING PRIMARY DUNES ON UNCONSOLIDATED SAND

- A1: Incipient Foredune (younger): Uniform regrowth of Grassland **Thinopyrum distichum*.
- A2: Established Foredune (older): Sparse Shrubland *Olearia axillaris* over Grassland *Spinifex longifolius*.
- A3: Beach-ridge Plain: Open Shrubland *Olearia axillaris*, *Rhagodia baccata* subsp. *baccata* and **Pelargonium capitatum* over Sparse Grassland *Spinifex longifolius* and Sparse Vineland *Cassytha flava* var. *flava*.



Plate 1: Representative photographs of 'Low-lying primary dunes on unconsolidated sand' (One Tree Botanical, 2020). The photographs depict Vegetation Type A1: Young foredune with Grassland of **Thinopyrum distichum* (left) and Vegetation Type A2: Established foredune with Sparse Shrubland *Olearia axillaris* over Grassland *Spinifex longifolius* (right).



Plate 2: Representative photographs of 'Low-lying primary dunes on unconsolidated sand' (One Tree Botanical, 2020). The photographs depict Vegetation Type A3: Beach ridge plain with Open Shrubland *Olearia axillaris* and **Pelargonium capitatum* over Sparse Grassland *Spinifex longifolius* (left). Vegetation Types A1-A3: Overview showing series of low dunes that constitute a beach ridge plain (right).

B: TALL SECONDARY DUNES ON UNCONSOLIDATED SAND

- B1: Shrubland dominated by *Acacia cyclops*, *Scaevola crassifolia*, *Spyridium globulosum*, *Santalum acuminatum*, *Myoporum insulare*, *Olearia axillaris*, *Rhagodia baccata* subsp. *baccata* and

Acanthocarpus preissii, Sparse Vineland *Hardenbergia comptoniana* and *Cassytha flava* var. *flava*. Over Forbland dominated by *Senecio pinnatifolius* var. *latilobus*.



Plate 3: Representative photographs of 'Tall secondary dunes on unconsolidated sand' (One Tree Botanical, 2020). The photographs depict Vegetation Type B1: Secondary Dune with Shrubland dominated by *Acacia cyclops*, *Scaevola crassifolium*, *Spyridium globulosum*, *Santalum acuminatum*, *Myoporum insulare*, *Olearia axillaris*, *Rhagodia baccata* subsp. *baccata* and *Acanthocarpus preissii* (left). Vegetation Type B1: Secondary Dune with Shrubland dominated by *Acacia cyclops*, *Scaevola crassifolium*, *Spyridium globulosum*, *Santalum acuminatum*, *Myoporum insulare*, *Olearia axillaris*, *Rhagodia baccata* subsp. *baccata* and *Acanthocarpus preissii* (right).

C: LOW DUNES ON SEMI-CONSOLIDATED SAND

- C1: Species rich low Shrubland dominated by *Melaleuca systema* and species rich Forbland dominated by *Lomandra maritima* and Sparse Sedgeland *Lepidosperma calcicola* and Sparse Rushland *Desmocladius asper*.



Plate 4: Representative photographs of 'low dunes on semi-consolidated sand' (One Tree Botanical, 2020). The photographs depict Vegetation Type C1: Species rich low Shrubland dominated by *Melaleuca systema* and species rich Forbland dominated by *Lomandra maritima*. Portion in Very Good to Excellent condition. Weed cover 1-2% (left). Vegetation Type C1: Species rich low Shrubland dominated by *Melaleuca systema* and species rich Forbland dominated by *Lomandra maritima*. Portion in Good condition. Weed cover 10- 50% (right).

D: LOW RISES WITH LIMESTONE OUTCROPPING

- D1: Closed Shrubland *Melaleuca cardiophylla* with other typical shrubs *Melaleuca huegelii* subsp. *huegelii*, *Acacia xanthina* and *Dodonaea aptera* with Sparse Vineland *Cassytha aurea* var. *aurea* over Forbland of native and introduced herbs.



Plate 5: Representative photographs of ‘low dunes on semi-consolidated sand’ (One Tree Botanical, 2020). The photographs depict Vegetation Type D1: Low rises with limestone outcropping with Closed Shrubland *Melaleuca cardiophylla*. Northern end of study area (left) and Vegetation Type D1: Low rises with limestone outcropping with Closed Shrubland *Melaleuca cardiophylla*. Southern end of study area (right).

E: CLEARED AREAS

- E1: Historically cleared areas; informal walking paths, informal vehicular sand tracks (unused and partially overgrown).



Plate 6: Representative photographs of ‘cleared areas’ (One Tree Botanical, 2020). The photographs depict Vegetation Type E1: Main pedestrian track (informal) from Two Rocks Road to beach. Weeds mainly confined to track edges (left) and Vegetation Type E1: Historically cleared areas along powerline corridor showing regrowth of vegetation and weeds along an informal pedestrian track (right).

A map of vegetation type and vegetation condition are presented in Figure 1 and Figure 2, respectively. Vegetation condition within the study area ranges from Excellent (Keighery 1994) to degraded (Keighery 1994).

No threatened ecological communities (TECs) listed under the BC Act or the EPBC Act were recorded in the study area. Two Priority 3 priority ecological communities (PECs) were recorded in the study area:

- Priority Ecological Community (PEC) SWAN 21: ‘Coastal shrublands on shallow sands, southern Swan Coastal Plain’. Described as heaths on shallow sands over limestone close to the coast, with no single dominant but including *Spyridium globulosum*, *Rhagodia baccata* and *Olearia axillaris* (DBCA 2019). Also known as Floristic Community Type (FCT) 29a (Gibson et al. 1994). Represented by Vegetation Types A3, B1 and D1 (Figure 2).
- Priority Ecological Community (PEC) SWAN 26: “Northern Spearwood shrublands and woodlands”. Also known as Floristic Community Type (FCT) 24 (Gibson et al. 1994). Described by DBCA (2019) as “Heaths with scattered *Eucalyptus gomphocephala* occurring on deeper soils north from Woodman Point. Most sites

occur on the Cottesloe unit of the Spearwood system.” This PEC is associated with the Tuart Woodlands TEC however no Tuart was observed within or adjacent to the study area. Likely to represent an unusual subtype, due to its extreme westerly distribution and three priority flora forming a substantial component of species assemblage of the vegetation. Represented by Vegetation Type C1 (Figure 2).

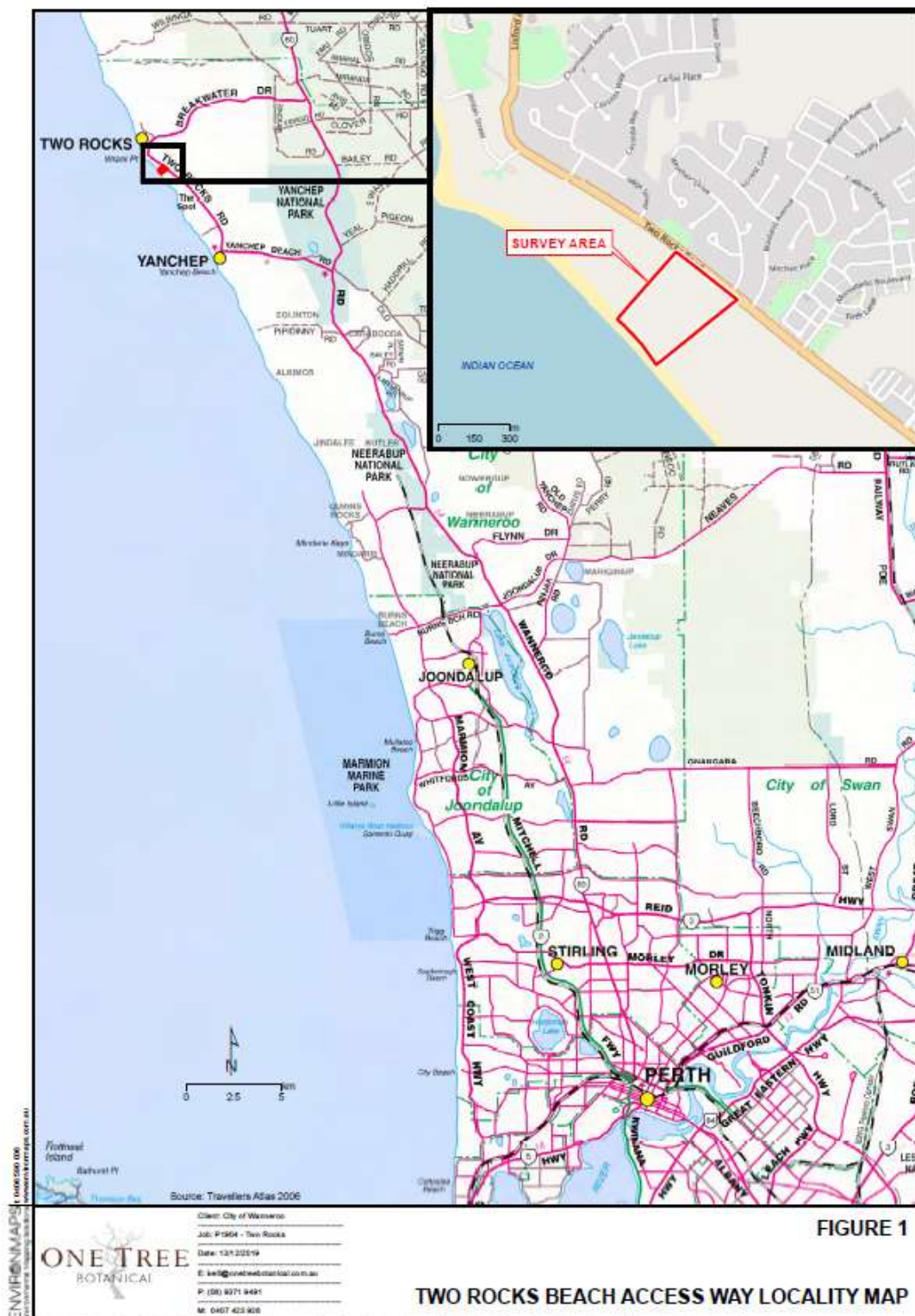


Figure 1: Two rocks beach access way significant flora location map (One Tree Botanical 2020)

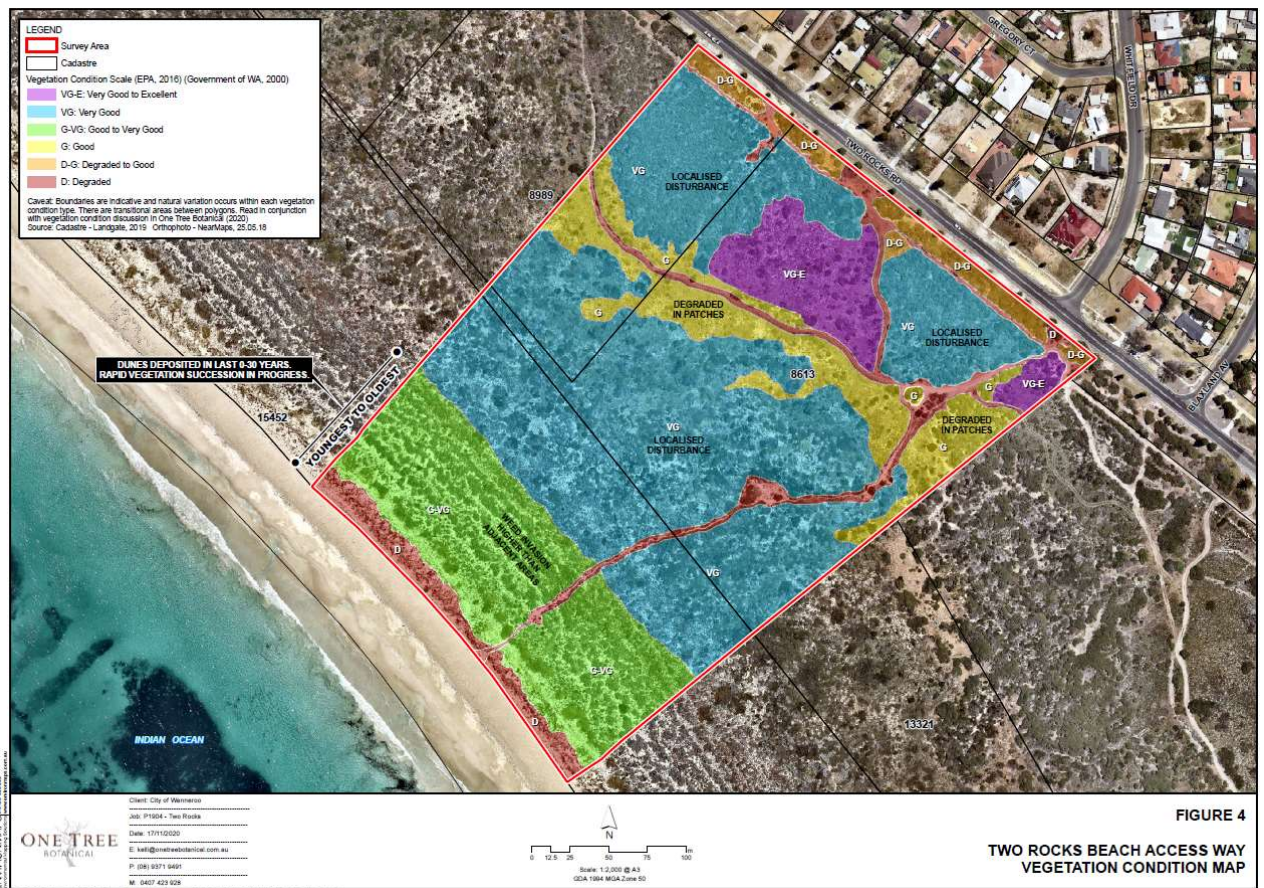


Figure 2: Two rocks beach access way vegetation type map (One Tree Botanical 2020)



FIGURE 3

TWO ROCKS BEACH ACCESS WAY VEGETATION TYPE MAP

Figure 3: Two rocks beach access way vegetation type map (One Tree Botanical 2020)

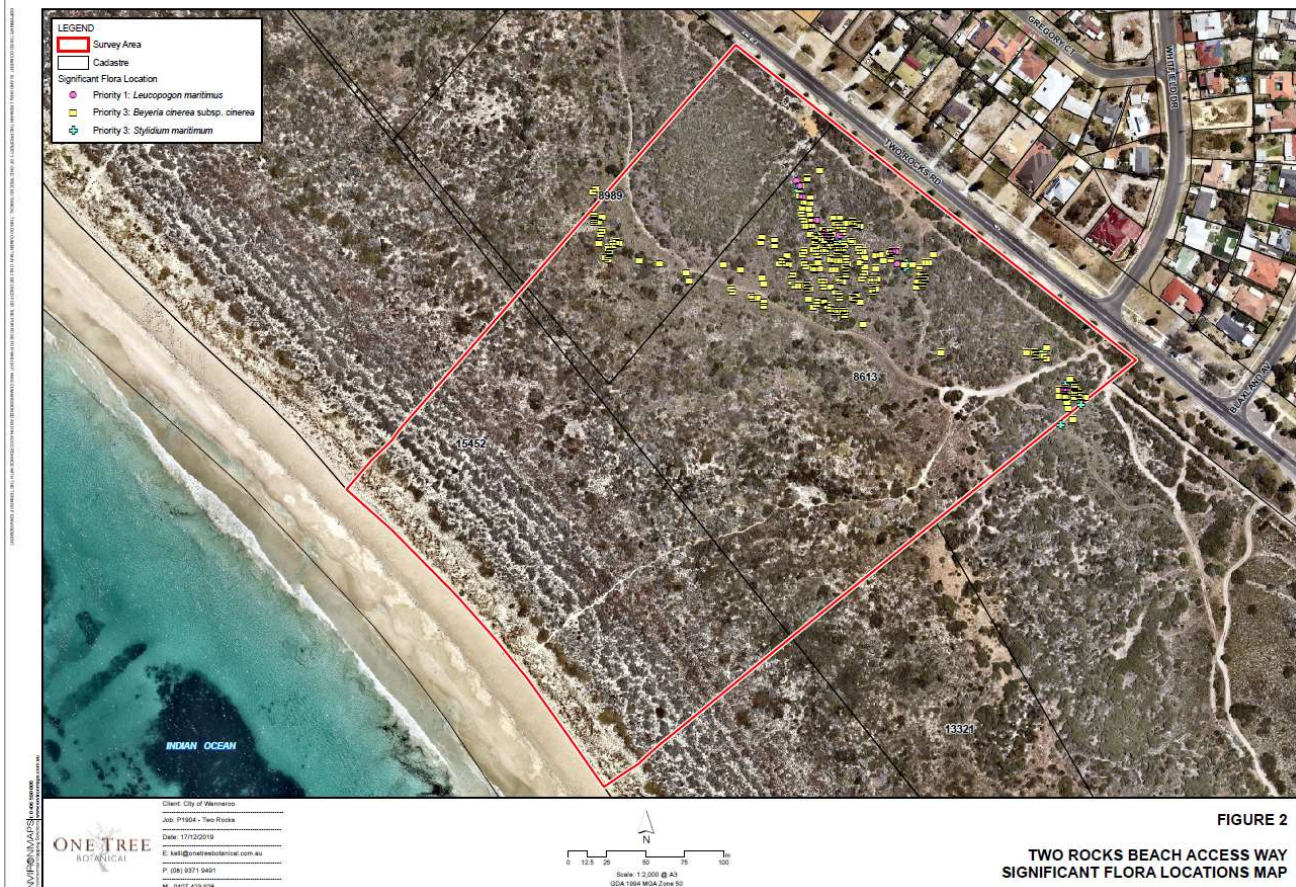


FIGURE 2

TWO ROCKS BEACH ACCESS WAY SIGNIFICANT FLORA LOCATIONS MAP

Figure 4: Two rocks beach access way significant flora location map (One Tree Botanical 2020)

F.2. Vertebrate fauna survey (Terrestrial Ecosystems 2020)

Overview

The City of Wanneroo requested a Level 1 vertebrate fauna survey for a portion of the foreshore reserve in Two Rocks. This area is bound by the Indian Ocean to its west and Two Rocks Road to its east. The area lies within Bush Forever area 397 and consists of approximately 10.4 hectares of land owned by the Western Australian Planning Commission (WAPC) and the Crown (Terrestrial Ecosystems 2020). The study area comprised:

- the entire Lot 8613 of Deposited Plan 213232 (94 Two Rocks Road, Two Rocks);
- part Lot 8989 of Deposited Plan 213232 owned by the WAPC, located adjacent to Lot 8613; and
- part Lot 15452 of Deposited Plan 40341 of Foreshore Reserve managed by the City, located adjacent to Lot 8613 (Terrestrial Ecosystems 2020).

The methodology broadly follows that described in the Environmental Protection Authority (EPA) Technical Guidance Terrestrial Fauna Surveys (EPA 2016b) and the Technical Guidance - Sampling methods for terrestrial vertebrate fauna (EPA 2016a; Terrestrial Ecosystems 2020). A Level 1 fauna survey involves undertaking a desktop review and reconnaissance site visit. The objectives of this fauna survey were to:

- provide an indication of the vertebrate fauna assemblage (reptiles, amphibians, mammals and birds) in and near the project area, so that potential impacts on the fauna and fauna assemblage might be adequately assessed; and
- describe the major vertebrate fauna habitats present (Terrestrial Ecosystems 2020).

The project area is within the Swan Coastal Plain 2 (SWA2) Interim Biogeographic Regionalisation of Australia (IBRA) subregion. This subregion is a low lying coastal plain, once vegetated by Banksia and Tuart on sandy soils, with *Casuarina obesa* on outwash plains and paperbark in swampy areas (Terrestrial Ecosystems 2020). The subregion is part of the West Botanical Province which has high species richness and diversity in flora and fauna (Terrestrial Ecosystems 2020).

Fauna Habitat

Fifty-five habitat assessments were completed in the project area. Three broad fauna habitats in the project area (Table 1). There are three broad fauna habitats in the project area:

- coastal low heath on sand;
 - mixed open shrubland and heath on sand; and
 - mixed closed shrubland over sand and limestone.
- Some of the site is highly disturbed or cleared and provides no habitat value (Terrestrial Ecosystems 2020).

Table 1: Habitat types in the study area (Terrestrial Ecosystems 2020)

Habitat category	Description	Area (ha)
Coastal low heath on sand	Low coastal heath on unconsolidated sandy low primary dunes. The quality of fauna habitat was variable.	1.915
Mixed open shrubland and heath on sand	Mixed open shrubs on taller unconsolidated sandy dunes. The quality of fauna habitat was variable.	6.22
Mixed closed shrubland over sand and limestone	Mixed closed shrubs on sand with limestone outcropping. The quality of fauna habitat was variable.	1.973
Highly disturbed		0.302

Plates 1-8 provide representative images of the fauna habitat types (Terrestrial Ecosystems 2020).



Plate 1. Coastal low heath on sand



Plate 2. Coastal low heath on sand



Plate 3. Mixed open shrubland and heath on sand



Plate 4. Mixed open shrubland and heath on sand



Plate 5. Mixed closed shrubland over sand and limestone



Plate 6. Mixed closed shrubland over sand and limestone



Plate 7. Highly disturbed or cleared



Plate 8. Highly disturbed or cleared

The condition of the fauna habitat varied from high quality, particularly in areas where the dense vegetation inhibits human access, to areas that are highly degraded, mostly by people accessing the beach (Terrestrial Ecosystems 2020).

Conservation significant Fauna

An assessment of the potential presence of conservation significant fauna species in the project area is provided in Table 2 below (Terrestrial Ecosystems 2020). The fauna species that have special status in either State or Commonwealth government legislation or are on the DBCA Priority species list and are potentially present in the vicinity of the project area are listed in detailed further in Terrestrial Ecosystems (2020). Although they were recorded in the search of the MNES online database, migratory species that typically would be found around the edge of salt lakes, clay pans, estuaries and marshes have been excluded from as there is no suitable habitat nearby (Terrestrial Ecosystems 2020). Threatened and conservation significant waders and shorebirds that utilise the beaches along the edge of the ocean or are marine migratory species or marine turtles that were identified in the matters of national environmental significance (MNES) online search have not been included in this assessment as the project area does not include habitat in which they will forage or nest (Terrestrial Ecosystems 2020).

Table 2: Assessment of the potential presence of conservation significant fauna species in the project area (Terrestrial Ecosystems 2020)

Species	DBCAs Schedule / Priority	Status under Commonwealth EPBC Act	Comment on the potential presence of a species
Woylie <i>Bettongia penicillata</i>	Critically Endangered	Endangered	Locally extinct from this area.
Western Ringtail Possum <i>Pseudocheirus occidentalis</i>	Critically Endangered	Critically Endangered	Locally extinct from this area.
Australasian Bittern <i>Botaurus poiciloptilus</i>	Endangered	Endangered	Not present in the project area due to a lack of suitable habitat.
Carnaby's Black-Cockatoo <i>Calyptorhynchus latirostris</i>	Endangered	Endangered	Flies over the project area, but a lack of suitable feeding, roosting and nesting resources means any visits will be infrequent.
Forest Red-tailed Black-Cockatoo <i>Calyptorhynchus banksii naso</i>	Vulnerable	Vulnerable	Flies over the project area, but a lack of suitable feeding, roosting and nesting resources means any visits will be infrequent.
Malleefowl <i>Leipoa ocellata</i>	Vulnerable	Vulnerable	Locally extinct from this area.
Chuditch <i>Dasyurus geoffroii</i>	Vulnerable	Vulnerable	Locally extinct from this area.
Balston's Pygmy Perch <i>Nannatherina balstoni</i>		Vulnerable	Not present in the project area due to a lack of suitable habitat.
Lancelin Island Skink <i>Ctenotus lancelini</i>	Vulnerable	Vulnerable	Highly unlikely to be in the project area.
Fork-tailed Swift <i>Apus pacificus</i>	Migratory	Migratory	May infrequently be seen flying in the region.
Grey Wagtail <i>Motacilla cinerea</i>	Migratory	Migratory	Highly unlikely to be seen in the project area.
Osprey <i>Pandion haliaetus</i>	Migratory	Migratory	Regularly seen flying over the project area but there are no roosting trees, so it is unlikely to roost in the project area.
Quenda <i>Isodon fusciventer</i>	P4		Potentially in the project area.
Black-striped Snake <i>Neelaps calonotos</i>	P4		Potentially in the project area.
Peregrine Falcon <i>Falco peregrinus</i>	OS		May very infrequently be seen in the project area.

P3 and P4 = Priority 3 and 4 species. OS – Other specially protected fauna

Results of the Commonwealth EPBC Act 1999 protected matters database search are provided in Appendix A.

It is probable that quenda (Priority 4) and black-striped Snake (Priority 3) are present in the project area. Carnaby's and forest red-tailed black-cockatoo would very infrequently be seen flying over the site, but the project is not their preferred foraging habitat, and they would not roost or nest in the area. Osprey will be regularly seen flying over the site but there is a very low probability that the peregrine falcon would be seen near project area (Terrestrial Ecosystems 2020).

Appendix G. Sources of information

G.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
-

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

G.2. References

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- City of Wanneroo (2022a) *Clearing permit application CPS 9578/1*, received 31 January 2022 (DWER Ref: DWERDT556337).
- City of Wanneroo (2020b) *Two Rocks Beach Access Road – Native Vegetation Clearing Permit Application Supporting Documentation*, received 31 January 2022 (DWER Ref: DWERDT565253).
- City of Wanneroo (2022c) *PR-4234 Two Rocks Beach Access – Rehabilitation and Revegetation Plan CPS 9578/1 May 2022*. Prepared by the City of Wanneroo (DWER Ref: DWERDT667926).
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