

Proposed Installation of Street Lighting Two Rocks Road, **YANCHEP-TWO ROCKS**

Native vegetation clearing permit application
Supporting documentation.

August 2023

Table of Contents

1. Introduction.....	3
2. Background	3
3. Scope	4
4. Flora and Vegetation	7
5. Fauna	10
6. Avoidance and Mitigation Measures	10
7. Clearing Principles	11
8. Conclusion	17
9. References.....	18

1. Introduction

The City of Wanneroo is proposing to undertake the clearing of remnant vegetation on the western verge of Two Rocks Road, and a small portion on the eastern verge from Capricorn Esplanade to Reef Break Drive, in Yanchep and Two Rocks. The proposed clearing will initially facilitate the completion of an Unexploded Ordnance (UXO) remediation search to ultimately facilitate the installation of street lighting along Two Rocks Road. The land affected by these works is entirely within the existing Road Reserve.

2. Background

The Two Rocks Road Street Lighting project has been prioritised by the City of Wanneroo as the section of Two Rocks Road between Capricorn Esplanade and Reef Break Drive is considered unsafe due to inadequate street lighting.

Two Rocks Road has connected Yanchep to Two Rocks since before 1965 and it is classified as a 'Regional Distributor' road in the Main Roads WA road hierarchy. Given the age of this road, its geometry does not always comply with the latest road design standards or current best practices which increases the risk of crashes on this road. Over a five year period, from January 2016 to December 2020, five crashes were reported on this road, all in the vicinity of vertical crests. Three of these crashes were head-on crashes, including a triple fatal head-on crash which occurred at night. Based on the recent crash history of this road, on 5 August 2022 the City of Wanneroo was granted funds under the 2022/2023 State Black Spot Program to install street lighting along Two Rocks Road. The provision of street lighting will better delineate advanced sections of road at night, particularly important on approach to vertical crests, hence helping to prevent and reduce road crashes and improve road user safety.

The City is also considering to upgrade this road to a dual carriageway in future years. However, it should be noted that the WA Department of Planning Lands and Heritage (DPLH) is currently undertaking a study to determine the future needs of Two Rocks Road, and any future requirement to dual Two Rocks Road would be a long-term project subject to the findings of this study, as well as ongoing strategic traffic modelling by Main Roads WA which will continue to be refined as development in the area progresses.

The project area is known for previous military exercise and is a high-risk area for the likely presence of unexploded devices. Consequently, the installation of street lighting cannot safely proceed without the completion of an UXO search and remediation.

When the City applied for the original clearing permit (approved CPS 9960/2), the lighting design had not yet been finalised by the appointed Contractor (Western Power). The City chose this

approach to expedite the process due to the urgency of these works and the requirement to deliver the project within the funding year (as per 2022/2023 State Black Spot Program). Nevertheless, the project has encountered delays due to modifications in the project footprint by Western Power, as well as delays in the completion of the final streetlight design. In their final design, Western Power identified additional areas required for the installation of low-voltage supply points as well as for maintenance of direct line-of-sight between the next immediate installing street poles. As a result of these modifications and delays, the City has been granted an extension of time to utilise the Black Spot funds, with the deadline extended to the end of the 2023/2024 financial year.

Recognising this, the City needs to promptly seek approval for clearing the additional areas in order to complete the works by the aforementioned deadline.

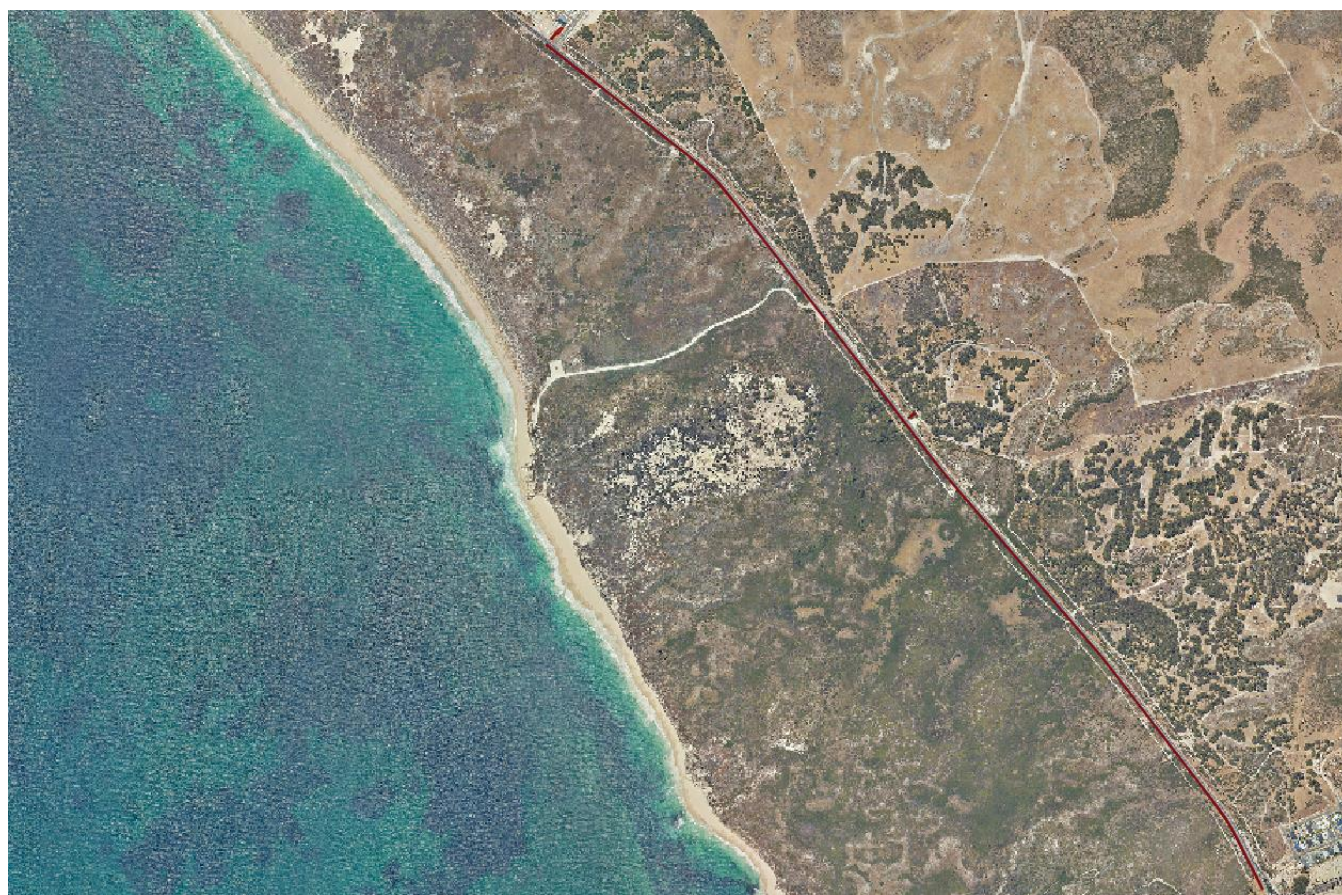


Figure 1: Locality map of Two Rocks Road (in red) connecting Yancheep and Two Rocks.

3. Scope

The purpose of this document is to provide an assessment against the *Environmental Protection Act 1986* – Ten Clearing Principles to determine whether the proposed clearing is likely to have a significant impact on the environment. The clearing of vegetation is proposed along the western verge of Two Rocks Road from Capricorn Esplanade to Reef Break Drive, as well as a small portion of the eastern verge. The proposed clearing will occur within a total boundary of 1.0317 hectares (ha) for an UXO search and subsequent installation of street lighting.

The proposed scope of works will include:

- UXO search (ground scanning) and potential UXO remediation works
- Trenching and backfilling works to a maximum of 600/800mm deep and 450/600mm wide for installation of electrical cables
- Installation of 12.5 m poles with twin 3m outreach arms and 170W LED single luminaires. Typically, holes would be dug via mechanical auger and then poles will be installed in place. This may change subject to ground condition, for example pad footing may be used for soft ground.
- The additional clearing areas are for the installation of low-voltage points connecting to and from the required distribution pillars and pole top transformers, where directional drilling / excavation will be required. Additional clearing is also required to maintain direct line-of-sight between the next immediate installing street poles in order to maximise safety and visibility.

It should be noted that the City intends to have two separate UXO surveys within project site, one for areas which are already cleared of vegetation and the other for areas which require clearing of vegetation before commencing the UXO search and remediation. UXO search in areas containing vegetation will commence as soon as the clearing permit is approved. The UXO search and remediation is expected to take in October 2023 and will take approximately four weeks to complete, including one week for completion of clearing for UXO search. Additional clearing will be undertaken to facilitate the installation of streetlights prior to commencing construction works and it is anticipated the clearing will take approximately one week to complete. The duration of construction works for the installation of streetlights will be approximately three months.

Clearing for UXO search and subsequent installation of streetlights will include removal of trees via mechanical means and removal of remaining vegetation by an excavator.

The clearing of vegetation is proposed along the western and eastern verge of Two Rocks Road, totaling 1.0317 ha (Figure 2 (below), (Attachment C - Amended Clearing Plan and Attachment B – Clearing Area Shapefiles). The total clearing area includes the original area of 0.9 ha previously approved under CPS 9960/2 and an additional area of 0.1317 ha.



Figure 2: Approved Clearing Area (in pink) 0.9ha (9000 m²) and Additional Clearing 0.1317ha (1317m²) for installation of streetlights on the western verge of Two Rocks Road, from Capricorn Esplanade to Reef Break Drive, for the provision of safe use of the road.

Two Rocks Road is surrounded by coastal foreshore and bushland areas, including Bush Forever Site 397 and Two Rocks and Yanchep Foreshore Reserve to the west; Yanchep National Park to the east; and residential areas to the north and south (Figure 3 below).



Figure 3: Proximity of proposed clearing (red line) in relation to surrounding Foreshore Reserve and Bush Forever Site to the west, Yanchep National Park to and east and residential housing to the north and south.

4. Flora and Vegetation

During the initial assessment on September 2, 2022, the City's Environmental Officer and Planner evaluated the vegetation in six different locations within the proposed clearing area (Vegetation Assessment 1), as indicated in Figure 4. Opportunistic sightings were also recorded when inspecting the entire clearing area (see Table 2, below, and Attachment C – Site Photographs, Attachment D – Photograph Locations and Flora List).

Furthermore, on June 22, 2023, an additional assessment was conducted by the City's Environmental Officer and Planner for the proposed additional clearing area (Vegetation Assessment 2). These areas are indicated by the blue dots in Figure 4 below.



Figure 4: Locations of Vegetation Assessment 1 (red points) and Vegetation Assessment 2 (blue points) along the proposed clearing area on the western and eastern verge of Two Rocks Road (Yanchep – Two Rocks).

Native vegetation is sparse throughout the proposed clearing area, with vegetation in a Good to Completely Degraded condition. It is estimated that approximately 30-40% of the total clearing area consists of native vegetation, the remainder consists of cleared ground and weed species.

The vegetation is dominated by several weed species: *Ehrharta longiflora*, *Eragrostis curvula*, *Leontodon rhagadioloides* and *Trifolium campestre*; and two native species: *Acacia rostellifera* and *Spyridium globulosom* (Attachment C – Site Photographs, Attachment D – Photograph Locations and Flora List).

A total of 43 flora species were identified during the survey, including 17 native flora and 26 weed species.

Table 1: Species identified during the Vegetation Assessments 1 and 2.

<p>Two Rocks Road YANCHEP/TWO ROCKS Black Spot Project - Lighting Upgrades VEGETATION ASSESSMENT 1 FLORA LIST 02 September 2023</p>
--

NATIVE SPECIES	WEED/PLANTED SPECIES
<i>Acacia lasiocarpa (opp)</i>	<i>Arctotheca calendula</i>
<i>Acacia rostellifera</i>	<i>Brassica tournefortii</i>
<i>Acacia cochlearis</i>	<i>Bromus diandrus</i>
<i>Acanthocarpus preissii</i>	<i>Ehrharta calycina</i>
<i>Allocasuarina lehmanniana (opp)</i>	<i>Ehrharta longiflora</i>
<i>Callitris preissii</i>	<i>Eragrostis curvula</i>
<i>Clematis linearifolia</i>	<i>Erodium moschatum</i>
<i>Dodonea aptera (opp)</i>	<i>Euphorbia peplus</i>
<i>Exocarpus sparteus</i>	<i>Euphorbia terracina</i>
<i>Hardenbergia comptoniana</i>	<i>Foeniculum vulgare</i>
<i>Lepidosperma gladiatum</i>	<i>Fumaria capreolata</i>
<i>Melaleuca cardiophylla</i>	<i>Gazania linearis</i>
<i>Olearia axillaris</i>	<i>Lagarus ovatus</i>
<i>Rhagodia baccata</i>	<i>Leontodon rhagadioloides</i>
<i>Scaevola crassifolia</i>	<i>Lolium perenne</i>
<i>Spyridium globulosom</i>	<i>Medicago littoralis</i>
	<i>Morea flaccida</i>
	<i>Oxalis pes-caprae</i>
	<i>Pelargonium capitatum</i>
	<i>Plantago lanceolata</i>
	<i>Poa annua</i>
	<i>Sonchus oleraceus</i>
	<i>Trachyandra divaricata</i>
	<i>Trifolium campestre</i>
<p>Two Rocks Road YANCHEP/TWO ROCKS Black Spot Project - Lighting Upgrades VEGETATION ASSESSMENT 2 FLORA LIST 22 September 2023</p>	
NATIVE SPECIES	WEED/PLANTED SPECIES
<i>Acacia lasiocarpa (opp)</i>	<i>Brassica tournefortii</i>
<i>Acacia rostellifera</i>	<i>Bromus diandrus</i>
<i>Acanthocarpus preissii</i>	<i>Cyperus rotundus</i>
<i>Callitris preissii</i>	<i>Ehrharta calycina</i>
<i>Hardenbergia comptoniana</i>	<i>Ehrharta longiflora</i>
<i>Melaleuca cardiophylla</i>	<i>Eragrostis curvula</i>
<i>Olearia axillaris</i>	<i>Erodium moschatum</i>
<i>Spyridium globulosom</i>	<i>Euphorbia peplus</i>
<i>Templetonia retusa</i>	<i>Euphorbia terracina</i>
	<i>Foeniculum vulgare</i>

	<i>Gazania linearis</i>
	<i>Lagarus ovatus</i>
	<i>Leontodon rhagadioloides</i>
	<i>Leptospermum laevigatum</i>
	<i>Oxalis pes-caprae</i>
	<i>Pelargonium capitatum</i>
	<i>Plantago lanceolata</i>
	<i>Trachyandra divaricata</i>
	<i>Trifolium campestre</i>
	<i>Brassica tournefortii</i>
	<i>Bromus diandrus</i>
	<i>Cyperus rotundus</i>

*Opp - Opportunistic sighting
***Additional Species found**

5. Fauna

During the aforementioned vegetation survey, no fauna was documented within the extent of the proposed clearing area.

The City's 'Environmental Planning Considerations Report' (EPCR) (Attachment D) and the City's 'Desktop Assessment Report for Native Vegetation Clearing (NVC) Application' (Attachment D) did not identify any instances of threatened or priority fauna species within the selected footprint. Protected fauna species were however identified within a 5km radius of the selected area (Attachment C and D).

The City's EPCR and NVC did identify the selected area as being located within Carnaby's Black Cockatoo (*Zanda latirostris*) breeding and roosting area buffers. The EPCR and NVC also identified the proposed clearing area was within or adjacent to a Key Biodiversity Area for Birds and contained vegetation mapped as Potential Quenda Habitat.

6. Avoidance and Mitigation Measures

The proposed clearing area boundaries are expected to be considerably larger than the actual clearing footprint. The City has purposely selected a larger area to account for all possible UXO search and remediation areas and Contractor working spaces.

Similarly to the original clearing area, the new clearing areas added to this amendment contain mostly weed species or areas previously cleared of vegetation and maintained as such for traffic

management purposes. Additionally, it is important to note that the extension of the original clearing area will be of minimal, involving an increase of up to 0.1317 hectares.

The additional areas represent working spaces required to undertake directional drilling and excavation for the installation of low-voltage supply points connecting to and from the distribution pillars and pole top transformers. Additional clearing of vegetation is required to maintain direct line-of-sight between the next immediate installing street poles. Without these works, the streetlights will not be able to operate and the presence of vegetation between adjacent poles will create visibility and sightline issues.

Overall, minimal clearing will be undertaken and clearing will be limited to what is required for works. These works are unavoidable and without intervention, the number and severity of crashes on this road are not expected to reduce.


7. Clearing Principles


The City generated a NVC (Attachment D) as supporting documentation for the below clearing principle assessment. The impacts listed in the report are categorised in Table 3.

This, along with the City’s EPCR (Attachment C) and additional data sources provided by various state and federal departments, were reviewed to determine the level of impact and the level of variance to the clearing principles.




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


Table 2: Identified Impact against Clearing Permit




Clearing Principle	Impacts*	Proposed Project Impacts
<i>Principle (a) – Native vegetation should not be cleared if it comprises a high level of biodiversity</i>	Red Flag 	<p>The proposed clearing area is not within a mapped Environmentally Sensitive Area (ESA) however it is in the vicinity of Bush Forever Site 397 (279 m at its closest point and 972 m at its farthest point, with an average distance of approximately 800 m).</p> <p>The City’s EPCR and NVC (Attachment E and F) identifies the following flora and fauna attributes for the proposed clearing site:</p> <ul style="list-style-type: none"> No records of Federal or State listed TECs, PECs, Threatened and Priority Flora records or Threatened and Priority Fauna records within the selected site boundaries

		<ul style="list-style-type: none"> • The proposed clearing area is within an important birding area (Northern Swan Coastal Plain IBA) • The proposed clearing area contains potential Quenda Habitat. <p>The City's EPCR and NVC (Attachment E and F) identifies the following flora and fauna attributes within 5kms of the proposed clearing site:</p> <ul style="list-style-type: none"> • Federal and State listed TECs and PECs (or their buffers) located within a 5km radius of the proposed clearing site • Federal and State listed Threatened and Priority Flora records located within a 5km radius of the proposed clearing site • Federal and State listed Threatened and Priority Fauna and Fauna Habitat records located within a 5km radius of the proposed clearing site • Confirmed Carnaby's Black Cockatoo breeding and roosting habitat buffers within 6km's of the proposed clearing site. <p>The City's Environmental Officer and Planner undertook a vegetation assessment of the proposed clearing area on 2 September 2022 and 22 June 2023. The survey identified that the vegetation within the proposed clearing area consists mostly of degraded roadside vegetation and therefore is not considered to comprise a high level of biological diversity.</p> <p>No flora species recorded at the clearing site represented a range extension or were otherwise unique in the local and regional area.</p> <p>Fauna species of conservation significance were recorded in the Yanchep-Two Rocks area (Alan Tingay & Associates, 1991; ATA Environmental, 2007), however it is not considered likely that any of these species would utilise the project site or depend on the project site for survival.</p> <p>Given the above, the proposed clearing area is not likely to be at variance to Principle (a).</p>
<p><i>Principle (b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna</i></p>	<p>Red Flag</p> 	<p>The City's EPCR and NVC (Attachment E and F) identified the proposed clearing area is within an important birding area (Northern Swan Coastal Plain IBA) and within Carnaby's Black Cockatoo Confirmed breeding and roosting area buffers.</p> <p>The proposed clearing area also contains potential Quenda Habitat.</p> <p>The City's Vegetation Assessment did not document any fauna species within the extent of the proposed clearing area.</p> <p>In a regional context, the vertebrate fauna in the Yanchep-Two Rocks area, including proposed clearing site, is similar</p>

	<p>to that found elsewhere in the region within National Parks and Conservation Reserves, particularly Yanchep National Park (Alan Tingay & Associates, 1991).</p> <p>Alan Tingay and Associates (1991) and ATA Environmental (2007) recorded ten species of conservation significance in the Yanchep-Two Rocks area, including Carnaby's Black Cockatoo (<i>Zanda latirostris</i>), Peregrine Falcon (<i>Falco peregrinus</i>), Graceful Sun-moth (<i>Synemon gratiosa</i>), Chuditch (<i>Dasyurus geoffroii</i>), Carpet Python (<i>Morelia spilota imbricata</i>), Southern Brush-tailed Phascogale (<i>Phascogale tapoatafa tapoatafa</i>), Black Striped Snake (<i>Neelaps calonotus</i>), Western Brush Wallaby (<i>Macropus irma</i>) and Rainbow Bee-eater (<i>Merops ornatus</i>). Carnaby's Black Cockatoo is unlikely to frequent the project site due to a lack of suitable feeding vegetation such as Banksia and Eucalypt woodlands, <i>Banksia sessilis</i> heath and other proteaceous species and pine plantations. Additionally, no suitable trees for roosting or suitable breeding hollows were recorded within the proposed clearing area.</p> <p>Widespread species such as Peregrine Falcon, Carpet Python, Western Brush Wallaby and Rainbow Bee-eater may occur occasionally in the proposed clearing area or surrounds but would not rely on this area for survival.</p> <p>Black Striped Snake has been recorded in the Yanchep-Two Rocks area in heathland habitats next to the coast. However, this species is rarely found in fragmented, cleared areas susceptible to weed infestation such as the proposed clearing area. This is because <i>Neelaps calonotus</i> feeds exclusively on small fossorial skinks (Shine, 1984) and weeds are known to have an adverse effect on the composition of microhabitats required by fossorial species (Maryan <i>et al.</i>, 2015).</p> <p>Chuditch and Southern Brush-tailed Phascogale are unlikely to occur in the proposed clearing area or in the vicinity as these species are generally not found in coastal habitats.</p> <p>Graceful Sun-moth is known to occur in open areas of herbland, heathland and shrubland on Quindalup soils close to the coast where it breeds on <i>Lomandra maritima</i>. As the City's Vegetation Assessment did not document any <i>Lomandra maritima</i>, it is unlikely that Graceful Sun-moth would rely on the proposed clearing area for survival.</p> <p>The City's EPCR (Attachment E) identified a record of Quenda near the project site. Quenda sightings have been reported by local residents in the Yanchep-Two Rocks area, however the population is presumed limited because of atypical habitat.</p> <p>Given that Quenda is likely to inhabit dense coastal scrub and the proposed clearing area mainly consists of degraded roadside vegetation, it is unlikely that the proposed clearing area represents a suitable habitat for this species.</p>
--	---

		<p>Due to the large extent of remnant vegetation available throughout the adjacent coastal health and the high value of vegetation in Bush Forever Site 397, it is unlikely that the proposed clearing will be seen as a significant habitat removal for fauna species.</p> <p>Additionally, the proposed works are not likely to cause any fragmentation of habitat beyond what is already created by the previous development of the Yanchep-Two Rocks area.</p> <p>Given the above, the proposed clearing is not likely to be at variance to clearing Principle (b).</p>
<p><i>Principle (c) – Native vegetation should not be cleared if it includes or is necessary for the continued existence of, threatened flora.</i></p>	<p>Orange Flag</p> 	<p>The City's EPCR and NVC (Attachment E and F) identified Threatened and Priority Flora species within a 5km radius of the application area, however no Federal or State Threatened or Priority Flora species were identified within the application area.</p> <p>Considering that the application area does not contain rare flora and the vegetation contains weed species and native flora ranging from a majority degraded to small areas of good condition, the application area is not likely to be at variance with clearing Principle (c).</p>
<p><i>Principle (d) - Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a Threatened Ecological Community.</i></p>	<p>Red Flag</p> 	<p>The City's EPCR and NVC (Attachment E and F) identified both Federal and State Threatened Ecological Communities (and buffers) within a 5km radius of the application area, however no Threatened or Priority Communities are present within the proposed application area.</p> <p>Due to the degraded nature of the clearing area, the vegetation it is not considered to represent a TEC and therefore the application area is not likely to be at variance to Principle (d).</p>
<p><i>Principle (e) - Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been significantly cleared.</i></p>	<p>Red Flag</p> 	<p>The City's NVC (Attachment F) identified the reason for variance is due to the presence of Vegetation complexes with less than 10% of pre- European extent protected for conservation on the Swan Coastal Plain portion of Perth. The study area is in the Interim Biogeographical Regionalisation of Australia (IBRA) region of the Swan Coastal Plan (SCP) in sub-region SWA2: Perth (Department of Environment and Heritage, 2000; Thackway and Cresswell, 1995).</p> <p>According to 1:250,000-scale vegetation mapping by Heddle et al. (1980), the study area is within vegetation complex 55: Quindalup. The National Objectives and Targets for Biodiversity Conservation 2001-2005 (Commonwealth of Australia, 2001) recognised that the retention of 30% or more of the preclearing extent of each ecological community is necessary if Australia's biodiversity is to be protected.</p> <p>The Environmental Protection Agency (EPA) has a modified objective to seek to retain at least 10% of the pre-</p>

		<p>clearing extent of each ecological community for defined constrained areas (intensely developed) in the Perth Metropolitan and Bunbury Regions (EPA, 2015).</p> <p>In accordance with DBCA's South West Vegetation Complex Statistics, the original extent of Quindalup Complex within the IBRA region of Swan Coastal Plain has been calculated as 54,573.87 hectares, of which 33,011.637 hectares or 60.49% remains intact (DBCA, 2018). This is therefore in exceedance of the recommended 10% target for the retention of vegetation at a local level in this region.</p> <p>However, EPA has also a target for the protection in lands reserved for conservation of at least 10 per cent of all vegetation complexes originally occurring in the Swan Coastal Plain portion of the Perth Metropolitan Region (EPA, 2015). Of the remaining Quindalup Complex extent, only 4,917.93 hectares or 9.01% is protected (reserved) for conservation (DBCA, 2018).</p> <p>Beard (1979) mapped the vegetation in the project area as comprising one Pre-European vegetation association – 1007 (Guilderton), which is described as mosaic shrublands, <i>Acacia lasiocarpa</i> and <i>Melaleuca acerosa</i>, <i>Acacia rostellifera</i> and <i>Acacia cyclops</i> thickets. Vegetation Association 1007 is described as originally consisting of 30,408 hectares of which 20,691 hectares or 68% remains. Of the remaining vegetation, 2,755 hectares or 13.31% is protected (reserved) for conservation (DBCA, 2018a).</p> <p>Although the Yanchep-Two Rocks area has been extensively cleared for agriculture and urban development, remnant vegetation is abundant locally within the adjacent coastal heathland and nearby Foreshore Reserve, Bush Forever Site 397 and Yanchep National Park.</p> <p>Given the current extent of the Quindalup vegetation complex and 1007 (Guilderton) vegetation association and the fact that the proposed clearing area consists mostly of degraded roadside vegetation, the City's proposed clearing is not likely to be at variance with clearing Principle (e).</p>
<p>Principle (f) - Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or a wetland</p>	<p>Green Flag</p> 	<p>Wetlands or watercourses are not located within the application area, or within 50 metres of the application area (Attachment E and F).</p> <p>The coastal heath vegetation within the application area is therefore not growing in association with a wetland or watercourse.</p> <p>Considering the above, the proposed clearing is therefore not at variance to clearing Principle (f).</p>
<p>Principle (g) Native vegetation should not be cleared if the clearing of the vegetation is likely</p>	<p>Green Flag</p>	<p>The proposed clearing is not located within an Acid Sulphate Soil Risk Area (DWER, 2022).</p>

<p>to cause appreciable land degradation.</p>		<p>The Groundwater Salinity (Total Dissolved Solids) at the proposed clearing site is Marginal with a salinity range of between 500-1000 mg/L (DWER, 2022).</p> <p>DWER's Perth Groundwater Map identifies the surface geology within the application area as Safety Bay Sand: Aeolian and beach lime sand (DWER, 2022).</p> <p>The Natural Resource Information (WA) mapping tool identifies three soil landscape types within the application area:</p> <ul style="list-style-type: none"> • Quindalup South oldest dune phase (211Qu_Q1) - The oldest phase. Dunes or remnants with low relief. Calcareous sands have organic staining to about 30 cm, overlying pale brown sand with definite cementation below 1m. • Quindalup South second dune phase (211Qu_Q2) - The second phase. A complex pattern of dunes with moderate relief. Calcareous sands have organic staining to about 20 cm, passing into pale brown sand; some cementation below 1 m • Quindalup South deep sand flat phase (211Qu_Qp) - Undulating landscapes with deep calcareous sands overlying limestone. Soils have dark grey-brown sand to about 50 cm and then pale brown sand. Remnants of hummocks are often present. <p>Given the above hydrogeological conditions and absence of risk factors associated with clearing within these hydrogeological features, it is not likely for the clearing to result in appreciable land degradation and therefore is not likely to be at variance to clearing Principle (g).</p>
<p>Principle (h) - Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.</p>	<p>Green Flag</p> 	<p>The project area does not intersect any Bush Forever sites, National Parks or Conservation Reserves. The nearest Bush Forever site (ID 397) is located 279 m west of the project site at its closest point and 972 m at its farthest point, with an average distance of approximately 800 m. Yanchep National Park is located approximately 2000 m east of the project site.</p> <p>Given the degraded nature of the vegetation proposed to be cleared and the separation distance between the project area and the aforementioned conservation areas, clearing is not expected to have any significant impacts on conservation areas and therefore it is not likely to be at variance to clearing principle (h).</p>
<p>Principle (i) Native vegetation should not be cleared if the clearing of the vegetation is likely</p>	<p>Orange Flag</p> 	<p>Wetlands or watercourses are not located within the application area, or within 50 meters of the application area (Attachment E and F). The coastal heath vegetation within</p>

<p><i>to cause deterioration in the quality of surface or underground water.</i></p>		<p>the application area is therefore not growing in association with a wetland or watercourse.</p> <p>As no surface water is present within the proposed clearing area, the proposed clearing is not likely to cause deterioration in surface water quality through sedimentation or eutrophication.</p> <p>The proposed clearing area is within the Perth Coastal Underground Public Drinking Water Pollution Control Area – P3 and within the Perth Groundwater Area RIWI Act area. Indicative groundwater depths show the water table is approximately 19 mbgl. Given that clearing will only require shallow disturbance, it is unlikely that groundwater will be intercepted or clearing would result in a significant change to groundwater levels or surface water runoff.</p> <p>Given the availability of remnant vegetation in the surrounding coastal heathland, it is not considered that the proposed clearing will increase groundwater salinity.</p> <p>The proposed clearing is therefore not likely to be at variance to clearing Principle (i).</p>
<p><i>Principle (j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause or exacerbate the incidence or intensity of flooding</i></p>	<p>NA</p>	<p>The proposed clearing area is a DAFWA Land Quality flood risk category – Category 0.</p> <p>The clearing is not likely to cause, or exacerbate the incidence, or intensity of flooding. The proposed clearing is not likely to be at variance to Principle (j).</p>

***Red** – Likely to be at variance, **Orange** – May be at variance, **Green** – Not likely to be or not at variance

7. Conclusion

The has assessed the proposed clearing against the 10 Clearing Principles and has found that the clearing of 1.0317 hectares (10317m²) of degraded roadside vegetation is not likely to be at variance to any of the Clearing Principles.

8. References

Alan Tingay & Associates, 1991. Yanchep Subdivision Plan – Vertebrate Fauna Survey. Prepared on behalf of Tokyu Corporation. Report No. 1991/20. October 1991.

ATA Environmental, 2007. Vertebrate Fauna Assessment St Andrew's Estate (Southern Precinct), Yanchep. Report No. 2006/32, October 2007.

ATA Environmental, 2007a. Flora and Fauna Management Strategy, Lots 2, 303 & 304 Two Rocks Rd, Yanchep. Prepared on behalf of Capricorn Village Joint Venture. Report No.2004/78 Version 10. July 2007.

Beard, J.S.,1979. The Vegetation of the Perth Area, Western Australia. Map and Explanatory Memoir 1:250,000 Series. Vegetation Survey of Western Australia. Vegmap Publications, Perth.

City of Wanneroo, 2022. Intramaps. Environmental Planning Considerations Report. Accessed 15 February 2022.

Coffey, 2010. Yanchep City Structure Plan Vegetation and Fauna Management Strategy. Prepared for Yanchep Beach Joint Venue. Report Reference: EP2088/129 Version 5, December 2010.

Commonwealth of Australia, 2001. National objectives and targets for biodiversity conservation 2001-2005. Environment Australia, NSW National Parks and Wildlife Service, Environment ACT, Department of Conservation and Land Management, Natural Resources and Environment, Department for Environment and Heritage.

Department of Biodiversity Conservation and Attractions (DBCA), 2018. 2018 South West Vegetation Complex Statistics Report. https://catalogue.data.wa.gov.au/dataset/dbca/resource/3d067960-2896-42fd-ba52-1aa46b2edf13?inner_span=True. Accessed 3 November 2022.

Department of Biodiversity Conservation and Attractions (DBCA), 2018a. 2018 Statewide Vegetation Statistics - Full report. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics/resource/0fc225fa-b06b-4da4-b5ed-62a146842389#:~:text=https%3A/catalogue.data.wa.gov.au/dataset/3d8c36a4%2D1863%2D4eee%2D9b7b%2Dbcc33973987f/resource/0fc225fa%2Db06b%2D4da4%2Db5ed%2D62>

a146842389/download/vegetation_statistics_statewide_2018_full_report. Accessed 3 November 2022.

Department of Biodiversity, Conservation and Attractions, 2021. Florabase – the Western Australian Flora. Available at <https://florabase.dpaw.wa.gov.au/>

Department of Environment and Heritage, 2000. Version 5.1 update of An Interim Biogeographical Regionalisation for Australia: a framework for setting priority in the National Reserves System. Government of Australia, Canberra.

Department of Primary Industries and Regional Development (DPIRD), 2022. Natural Resource Information (WA) Mapping Tool. <https://maps.agric.wa.gov.au/nrm-info/> Accessed 19 July 2022.

Department of Water and Environmental Regulation, 2022. *Perth Groundwater Map*. Available at <https://maps.water.wa.gov.au/Groundwater/> Accessed 19 July 2022.

Environmental Protection Agency (EPA), 2015. Perth and Peel @ 3.5 million Environmental impacts, risks and remedies. Available at <http://www.epa.wa.gov.au/sites/default/files/Publications/Perth-Peel-s16e-interim-advice-2015-web.pdf>.

Hedde, E.M., Loneragan, O.W. and Havel, J.J., 1980. Atlas of Natural Resources Darling System Western Australia: Geology, Mineral Resources and Hydrogeology of the Darling System, Western Australia. Department of Conservation and Environment, Perth.

Maryan B., Gaikhorst G., O'Connell M. and Callan S., 2015. Notes on the distribution and conservation status of the Perth Lined Skink, *Lerista lineata*: a small lizard in a big city. *The Western Australian Naturalist* 30, 12–29

Shine R., 1984. Ecology of small fossorial Australian snakes of the genera *Neelaps* and *Simoselaps* (Serpentes, Elapidae). *University of Kansas Publications of the Museum of Natural History* 10, 173–183

Thackway, R and Cresswell, I., 1995. An Interim Biogeographic Regionalisation for Australia: A Framework for Setting Priorities in the National Reserves System (as amended). Australian Nature Conservation Agency, Canberra.